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Preface

It is undeniable that in the 21st century there are more challenges faced by those in Education as we grapple with the age of knowledge economy. Therefore it is critical that those who identify with the vision of the African Academic Research Forum (AARF) should gather once more to deliberate and share their Educational experiences with colleagues from Africa and beyond. Importantly, we want to ensure that there is a cross-pollination of ideas including sharing best practice from our domains. It was on this basis that we themed this 4th South Africa International Conference on Education (SAICEd) to be: Rethinking Education in the 21st Century. The theme is in recognition of the fact that we need to think about our outdated teaching practices in line with the technology savvy student we encounter in our lecture halls. We will achieve this when there is greater sharing of successful practices.

The intention of the AARF, through the SAICEd 2017 Conference is to make sure that Proceedings contains only papers that had gone through a rigorous, blind peer review process. We can assure all participants that our reviewers were experts in the field of Education who wouldn't approve any work that was not of 'international standard'. We received a total of 63 long papers for possible presentation and publication from participants from ten countries. The final accepted number was 28. This book therefore contains those long papers that, through the process described here, were accepted.

We are happy to report that almost all participants submitting abstracts were invited to the conference. We did this because we understand (i) the importance of sharing one's research with others; and (ii) how this allows, especially new researchers, an opportunity to interact with renowned researchers in their field.

We would like to express our sincerest gratitude to our reviewers who tirelessly ensure that the papers presented at this conference are comparable to any other in the field of Education. We cannot forget the esteemed keynote speakers including the workshop presenters, for the time and expert knowledge they are prepared to share with our participants. Finally, a word of appreciation to the technical staff and the editors who ensure that the book of abstracts and proceedings are ready; the conference runs smoothly; and are for ever ready to assist participants.

To everyone, best wishes to you and enjoy the conference..

Prof A. Mji
Conference Chair

List of Reviewers

The organising committee of SAICEd 2017 would like to greatly thank the following reviewers who took the pains to review the conference papers.

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Prof Masilonyana Motseke	University of South Africa

Review Process

In total, 150 manuscripts in different areas within the field of Education were received. Of these manuscripts, 63 were intended to be full papers while the rest were to be short papers. All the full manuscripts were subjected to a double blind review. The reviews were carried out by experts from different countries. Their brief was to base their reviews on 22 criteria they were supplied with. They were also requested to look at the manuscripts with the aim of assisting authors to produce good quality presentations.

Following the review process, the editorial committee considered the reviewers' comments and 27 manuscripts were found to be unsuitable for publication. Reports were forwarded to the remaining 34 authors with suggestions of what needed to be addressed. After receiving the re-worked manuscripts, the editorial committee finally accepted 28 for inclusion in the proceedings. This means that the acceptance rate was just about 44%.

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LEADERSHIP ROLE IN INCULCATING VALUES INTO THE MANAGEMENT OF SELECTED UNDERPERFORMING ADULT LEARNING CENTRES IN GAUTENG

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Abstract
There is a strong link between a value laden institution, leadership and learner performance at the various adult learning centres. Adult education as the newest aspect of the general education provision in the new South African education system seems to be continuously marginalised within the education context. Both teaching and management staff of most adult centres are professionals who were trained for the mainstream school system. Indeed very few of the people involved in the provision and management of adult education have any form of training from the discipline and this obviously may have some negative effect on learner performance. The leadership of most adult learning centres grapple with requisite managerial competencies to lead and manage efficiently and effectively. The objective of this paper was to investigate two learning centres in Gauteng and establish the extent to which a permeating climate is established through agreeable values for a conducive teaching and learning environment. A qualitative research method was employed and useful conversations (interviews) were conducted with the centre managers and ABET officials from District and Provincial offices to solicit their views on how management can inculcate values that can improve the management of teaching and learner performance. The study found that to be able to improve learner performance and reduce marginalisation of adult centres both management and educators should engage in continuous professional development activities to be more knowledgeable about adult education as a profession and practise.

Keywords: Leadership and management of ABET; Values; Underperformance; continuous professional development

Introduction and overview
The concept of performance in education remains a topical matter. As with many educational issues, the need to perform widens to a point where it seems that performance as a concept applies almost to anything and everything, including leadership of adult centres in this context (Davies, 2007; Hargreaves and Fink, 2006). The significance of effective leadership for improved results has become a narrative in recent times, but there is little emphasis on the importance of what values educational leadership means and its implication in attaining quality results in adult learning centres specifically. In earlier writing (Setlhodi-Mohapi, 2013) values centered leadership was defined as leadership that punts values to maintain school performance at a high level; or strive to improve it over a period of time; and argued for the significance of shared values over a sustained improvement of performance. Enhancement and sustainability of good performance require an intention to develop capacity and continuous professional improvement. To sustain this, supportive external and internal

conditions are necessary (Hargreaves and Fink, 2006). The sustenance of good performance by the leadership supports continuous development, affirms a culture of leadership based on "moral purpose", and offers prosperity to every stakeholder (Davies, 2007, p. 11). The role of a leader is to create a culture of performance improvement motivated by values and principles that are consistent with instilling shared values and creating a permeating climate that encourages staff to develop professionally. Adult learning centres that perform poorly lack this sort of leadership foresight. Consequentially, their institutions underperform and generally giving a condescending impression about the quality of teaching and learning offered in these centres and the significance of education offered to adults.

Adult education is an avenue to offer basic education and training to those who:

- cannot attend main stream schooling'
- due to age, no longer qualify to attend mainstream schooling,
- want to upgrade their schooling qualification
- Require basic literacy and numeracy skills and upgrade their level of reading ability.
- complete level four education according to South African Qualifications Authority Framework (SAQA)

These offerings require well-run institutions for adult education if they are to satisfy the need that they were designed for. Thriving adult centres in turn need leaders who understand the complexities of managing such institutions and leading professional personnel, majority of whom were not trained to teach adult learner and non – professional staff. This dilemma in itself is indicative of a system in paralysis and expose the dire need to streamline the significance of adult basic education if eradication of adult illiteracy is to be achieved. There is also a need for professional development of both managers and educators in ABET centres to mitigate the gap in knowledge with adult education discipline. The leadership within adult education sector is central to the development of numerous forms of human capital and adds value to social capital (Nafukho, Wawire & Lam, 2011). The climate created should allow performance to fester, flourish, and inspire the will to develop professionally. This will primarily depend on the calibre of leadership in these centres.

This paper presents five different sections. First, the literature review. Second, it describes the methodology. Third, the case of two adult centres. Fourth, it discusses the analysis and key findings using the literature that guided the research and finally, it concludes with implications for practice and sustainability.

Literature Review

Becoming a successful ABET centre manager involves 'being many things'. Amongst others, it involves: possessing leadership capabilities; knowledgeableness in the trade, understanding that the basis for interpersonal relations is the ability to pull energies together for collaborative endeavours by tapping on to beliefs, values and agreeable practices; being

available to support; guide and develop (or recommend/ arrange development for) staff; establishing a permeating climate; planning and guiding practices for improved performance and embarking on professional development initiatives to continuously sharpen their sickles within the discipline. This is commensurate to their job requirement. In addition to these attributes, centre managers need to understand the nature of leading transformation for improved performance. Chriestie (2008, p. 216) advises, "We will always have to face circumstances which are not of our choosing" and advises that this will affect institutional ethos and influence all parties to contribute towards the enhancement of their institution and community at large. Leaders have to embrace the values of care in their practice so that other stakeholders can emulate the moral conduct and aspire to be morally obliged and diligently serve in order to benefit their learners and communities served. In addition, so that professionals involved in these centres can continue to develop themselves.

The above perceived successes highlight significant and deliberate action to be taken for transforming ABET centres. Seen as such, there is a compelling need for centre managers to create a space for good practices. However, they have to respond to a critical question: what prompted us to get off course, bring about our institutions to self-destruct before our eyes? The responses to this question may be complex. However, the suspicion is that one root cause is a lack of devotion to positive core values and will by staff (leaders and educators) to develop professionally. A great number of institutional failures could be due to insignificant notion of having and living by institutional core values. This paper does not seek to propagate any leadership style, but highlight that at the deeper level, the success of any leadership style, is underpinned by values. Effiong & Anangabor (2016) maintain that a desired culture can only be created if leaders adopt the function of recognising, promoting and exhibiting desired values as an essential element of operational long-term leadership. Mavimbela and van Niekerk (2016) have found the following factors to be influential in adopting and managing values within institutions:

- Impact of societal factors on values formation in institutions of learning
- No sense of urgency
- Lack of stakeholder involvement
- Stakeholder and community involvement proves that social capital is available
- Cultural practices, beliefs and attitudes
- Lack of support by the officials regarding attitudes
- The impact of continuous changes in policies pertaining to curriculum
- The role of leaders in institutions and educators alike as moral agents

Under the day-to-day pressures of operation in various institutions, various actions and attitudes are astonishingly almost instantly justified. Absence or deviations from core values are argued for, based on the conditions under which people operate, causing a fast slide on a poor results slope to underperformance. Leaders have to create operational spaces and build collaborative teams by establishing conditions that allow for the establishment of core values.

Core values have to be a significant aspect of decisions taken when plans are developed to improve performance (Ramphele, 2012). Strengthening performance improvement strategies calls for agreeable values (where all stakeholders are involved) to be adopted and presented as the basis for initiating a sense of urgency and acknowledging the strength social capital bestows towards contributing to the success of the institution. Social capital in this instance includes stakeholders, the community and Department of Basic Education's (DBE) officials. The hope is that challenges raised throughout the DBE officials' interaction with all parties involved, will be escalated and considerations will go into looking at these when policies are reviewed or initiated. All parties involved have the moral obligation to own, share, define, institutionalise, uphold and respect agreements and observe the core values shared.

ABET Leaders play a key role in becoming moral agents. By living the core values established, they complete the cycle of honouring the essence of their leadership and strut forward to become deciders in steering performance improvement agenda. Deciders are authorised to wield the leadership whip through power bestowed on them and mediate ethical and moral responsibilities. Power thrive through the energy of influence (Mann, 2012). The idea is to have power felt in a manner that portray the moral duty and work towards improvement of the status quo. ABET Leaders determine and influence the course of action stakeholders need to take, in honouring the core values and following suit to implement strategies designed for transforming their institution. Surfacing the values and making them public for all to see is both a marketing strategy and a move to create tolerable ambience and nobility. Honour breeds a climate of collective effort and fester through deliberate intent to develop professionally.

Values Theory

The nature of values

Values have worth, importance, and implication. African societies are a weave of culture, beliefs, and values (Olaopa, 2012). The connectedness of these aspects represents heritage from previous generations, depict inclination to honour, and preserve them. Generally, the connection with others is based on tradition identifiable through totems. At the epicenter of a tradition are values. Schuitema (2004) explains that values underlie an encounter with others. The phenomena of values can be either relational or dynamic. Relational values stem from interactions (social), heritage (tradition and inheritance) and or are learned, whereas dynamic values consciously embraced because of the meaning brought and their resonance (Marx, 1847). Values always have value, meaning, and significance; hence, they can echo them in various ways to suit contexts and types.

Types of values

Values can be categorised into ethical/moral (attitude informing conduct); doctrinal/ideological (religious or politically motivated), social (influence from society/ culture) and aesthetically (appeal because of observing desirable practice/s) (www.org/values-personal&cultural). These categories can be divided into two distinct values types; personal and cultural.

1. *Personal values*

Personal values provide intrinsic hope from which individuals can consult internally for what they consider good, important, desirable, acceptable, constructive and are the source to people's actions. They form during three significant periods:

- Imprint period: birth to seven years
- Modelling period: eight to fourteen years
- Socializing period: fifteen to twenty one years

Shaping of the conduct people bring with in organisations happened throughout these stages (Setlhodi-Mohapi, 2013). Habits and attitudes form because of what happens from imprint to socializing stages. The values may change with time, however certain characteristics shaped over 21 years may remain unique character 'neurons' with the likelihood of leaning to elements of cultural practices (some of these may evolve and so with culture).

2. *Cultural values*

Cultural values relate to the norms of a culture (www.org/values-personal&cultural). They are more global and abstract compared to norms. Enculturation happens universally, across cultures and individuals may not necessarily conform to the entire values base of the culture immersed. They rather scoop what socially appeals through a process simulating 'synereses'. Social action evolves common values and adherence over time, resulting into a social activity such as planning that cause social cohesion and security over time (Ndebele, 2002). Strong conviction to survive under trying circumstances from both traditional, cultural and social practices activate competences developed through observation and practice. These generally happen because of beliefs and societal ethos. Thus, the energy evoked through social collaboration create values base associated and embraced. Bringing about social cohesion and raising social capital profile. Leaders in such instance generally enjoy the support of society.

Managing intricacies and assuming the leading role in ABET centers

It is essential for ABET Leaders to see their responsibilities beyond structural and institutional responsibilities and recognise that overall, assuming the leading role may give them the urge needed to transcend performance paralyses. Christie (2010) observes parallels drawn between 'leadership' and 'management' with insignificant difference in their application. Marunga (2012) echoes and adds that leadership is a comprehensive deed consisting of but is not limited to management. That they refer them to as ABET Leaders is more of a label tagged to individuals appointed at the helm of these centres than it is the literal divergent meaning between the two concepts. Trials and tribulations should be viewed imperative properties of the management process that when taken positively; elevate managers beyond their current levels of thinking, understanding, skills, outlook, and capabilities (Nafukho et al, 2011). Assuming the responsibility of leading and managing can place these managers on course to confronting real issues within their institutions.

ABET centers, unlike schools, are riddled with numerous challenges among of which is sharing spaces with schools, inadequately trained educators (mostly mainstream rather than ABET), inability to retain staff, irregular learners, 'second priority, after schools', inadequate resource allocation by DBE, and instability. Respondents also raised some of these factors during interviews. This necessitates ABET leaders to harness such difficulties by not letting them get in the way of progress but rather look at other means of complementing what cannot be provided for their institutions. The energy invested in this case, harmonises challenges by matching them with activities and can be a reason to consider these challenges as attributes among other responsibilities of their job (Nafukho et al, 2011). Values afford authentic pondering to get solutions. Involving other managers and engaging in constructive collaboration with all interest parties can create opportunities for critical contributions that may help shape a path to pursue. This idealises cooperate governance and supports its principles within ABET management context. It is this attitude towards work that could enable them rise to challenges and see opportunities around them. The question remains, how can this happen when adult education costs are low comparatively?

Sound financial purse allows for better planning, encourages efforts to do better and it means basic requirements can adequately be fulfilled. However adult education receive lower budget compared to mainstream schooling system. There are no clear norms and standards for funding and infrastructure provisioning. Aitchison & Alidu (2009) confirm that adult education costs seems to be kept low by using schools and not specifically having infrastructure for ABET as well as low salaries of practitioners or professionals. The salary factor influences staff morale hence most educators grab teaching opportunities within a drop of a hat. ABET leaders need to develop innovative ideas to retain staff and keep them inspired.

Personal professional development

The National Policy Framework for Teacher Education and Development (NPFTED) was developed for the initial professional education of educators and as an attempt to continuously and conceptually capacitate educators in their practice [Continual Professional Teacher Development (CPTD)] (Department of Education 2007). Steyn (2010) affirms that the intention of policy for educator development focuses on getting suitably qualified educators through training as well as continuous development, for the improvement of educators' conceptual knowledge and skills in their discipline. He further warns against factors hindering CPTD such as negative attitude, poor planning of development programmes that fail to make impact (Steyn, 2010). The cultural background and values base of educators influence their knowledge, skills, attitudes, vocabularies and interaction with others. This offers a cogent emphasises that training and development should happen with compassion. Therefore, placing of consideration should be on:

- meeting the basic needs of educators;
- suitability of their environment;

- special devotion to their abilities and attitudes (as a result of their background);
- social-emotional adjustment and feelings (empowered or powerlessness) and
- understanding of the consequences of their attitude and conduct within their practice and profession.

A social constructivist approach informs the above. It states that human beings develop varied meanings in relation to their experiences as they strive to make sense of their world-view (Cresswell, 2007). They know in understanding their circumstances and establishing guidelines for determining right from wrong. This begs for ethical consideration. As early as the initial training of educators, professional ethics should be clarified and the importance of observing the professional code as a basis of developing moral obligation for continuous improvement of professional competence has to be emphasised (Burke, 2014). This will enable ABET managers and principals alike to assert acceptable professional practice and at the same breath consider proposing suitable institutional principles (based on available policies) for encouraging educators' investment in their professional development. Taking initiative to develop signify determination to change overall and begins with an attitude for change. ABET managers may initiate the construction of compelling development principles aligned to the Integrated Quality Management System (IQMS) which advocates for informing educators' developmental needs. Gichuki (2014) advances that leaders make meaning (need to focus on the task) and encourage successful performance by motivating staff to strive for high standards and communicating the importance of attaining objectives for their plans.

Planning for Teaching: Inspiring learning

Building a strong teaching and learning culture necessitates deliberate provision of support and guidance. Adult educators need to understand the most suitable methods for specific learners they teach. By adopting practices that set an encouraging learning field, they stimulate learning. Gravette (2014, p 14-16 & 43) proposes teaching practices that enable learners to connect new knowledge to experiences through reflection by providing platform for sense of immediacy as well as encouraging that learners assimilate new knowledge acquired through both "monologic" and "dialogic" teaching. Adult educators need to understand reasons for adult learners' pursuance of learning. Fasokun, Katahoire & Oduaran, (2005) suggests that the rationale behind adults' learning in Africa are mostly socio-economic, political, and psychological or work related. The fact that there is will power implies, given adequate support and encouragement, adults will progress in their learning. This proofs that the success of adult learning is largely in how planning, preparation and support happen for learning to succeed.

Learning is not a linear process. There are three dimensions shaping any form of learning: formal, non-formal and informal learning. These types broadly determine the limits of the

economy of scales regardless of socio-economic and political factors. In the case of ABET (in this context), learners are mainly involved in formal type of learning. The implication is that appropriate planning for teaching has to happen to enthuse learning. Key to the success of learning should be purposefully planned curriculum in an African context so that it is relevant to learners and thus appealing. Malunga (2006) put forth that education in Africa has a potential to use what has been collected through learning process for personal and community gain. Reaching a state where learning translates into service (making a difference at a personal or societal level). This supports a transformational learning by ABET managers.

Methodology

Data Collection

Exploration of participants' experiences, perceptions, feelings, attitudes and reflections about factors that impede effective leadership; adopted a qualitative case study of two adult centres with similar dynamics was adopted. The objective was to establish the understanding about establishing a permeating climate through shared values for beneficial learning environment that will cause performance improvement. This approach embeds in an interpretative paradigm considered suitable for exploratory study. The paradigm allowed the researcher to look, hear, comprehend and create meaning from participants and the interpretation of their environment. The reason is, values and feelings can only be interpreted from the insider perspective (Henning, Van Rensberg & Smit, 2004).

Two centre managers of underperforming adult centres were selected purposefully from two adult centres in Gauteng province to establish how the centre managers perceived their role in relation to inculcating values whilst leading their institutions. Both these managers were trained for mainstream schooling system and pursued adult education when they could not progress "to their satisfaction" in the mainstream system (as expressed by one of them). Data was obtained through semi-structured, in-depth individual interviews using three open ended questions as a guideline to explore the leadership role in inculcating values in the management of ABET centres to eradicate underperformance. Telephonic follow-up was done to comprehensively explore the ABET managers' practice. Two officials supporting ABET centres one from the District office and another from the Provincial office were interviewed to get their views about ABET centre management and the sort of issues they may have established to be influencing these institutions' performance.

Achievement of credibility in this study was through triangulation of data, respondent and process whilst validity attainment was by assimilating the opinions and methods (Torrance, 2012). Triangulations occurs when more than two methods for data collection are used (Torrance, 2012). In this study, the use of triangulation was for the researcher's deeper and wider understanding of the research problem (Yeasmin, & Rahman, 2012). Documents such as minutes, plans (including intervention plans), teacher and learner performance schedule were studied to uncover the extent to which values are inculcated by the leadership whilst supporting teaching and learning and corroborate the data obtained from the ABET centres' managers.

The case of ABET centres

This article draws from two adult learning centres, which are underperforming. They are situated in Gauteng Province, South Africa. These centres are housed in schools and as a result may deem them 'squatting'. Their enrolment is comprised of both youth (within the adult age cohort) and adults. Both centre managers hold secondary school professional qualifications and later did a qualification in adult education. As a result, they were not professionally trained as adult educators and both acknowledged that they ventured into adult education after teaching part time whilst working in schools for over 10 years. One confessed that an opportunity presented itself within the management and he then decided to apply. He subsequently rose through the ranks until he became the centre manager. The situation is similar with the case of educators and other members of the management team. In one centre, about 38% of the staff members were trained ABET practitioners whilst at another centre only 23% were trained ABET centre practitioners. Both centres employed some educators who either resigned or took early retirement from the mainstream schooling system. One manager was of the view that non – committal attitude with some of these educators could be for the preceding reasons.

Both centres have a challenge of irregular attendance by learners. Some learners (particularly the youth bracket) neglected attending classes even when they were present at the centres. There is little enforcement of the code of conduct for learners and as a result, educators opt to ignore them. This generally resulted into lack of discipline. In some cases, educators show up late and there is little evidence of preparation for lessons. In both cases, centre managers confessed to turning a blind eye. However, in both centres there are pockets of good practice with a few educators going an extra mile to support initiatives by the management. Although the managers alluded to some educators furthering their studies, they explained that it has not translated into any form of improvement with some of these educators. Both managers did not implement IQMS policy according to Resolution 8 of 2003 and had not mediated CPTD framework to staff. They also failed to encourage educators to consider professional development initiatives aligned to CPTD. Support from the Department of Education was perceive less vigorous as it was with schools by both centre managers.

Data Analysis, findings and discussions

The interviews were recorded, transcribed and studied to explore the role of ABET centre managers' in inculcating values to tackle underperformance in their institutions. Analysis was using content analysis of data from interviews by searching out underlying themes in the analysed literature to substantiate data presentation and interpretation (Bryman, 2012). Classification of relating responses was through codes, forming themes that were used to present the findings. Leaders, who desire improvement of performance in their institutions, identified five key findings for consideration:

- *Building collaborative teams within their institutions by establishing working conditions that facilitate staff collaboration for planning, staff development, and sharing leadership;*
- *Building an enabling climate that allows for performance to improve;*
- *Planning for teaching and learning improvement strategies by demonstrating – through their actions – that they have high expectations for staff and students alike; and*

Iinstilling values that will make work diligence compelling.

- *Lack of prowess in adult education practice and limited participation in CPTD*

Building collaborative teams within ABET centres

Success borders on all parties coming together for a grander purpose, particularly in situations where there is pressure for improvement of performance. That performance is poor in the first instance, is indicative of the fact that there may be diverse energy towards dispensing off with work and possibly lack of decisive stewardship to pull efforts together for the greater good of the institution. One of the participants highlighted that "*the only way here is to make everyone aware that we can do it if we pull together and respect one another. I think ensuring that everyone is expected to do their fair share, and cooperate will make us improve a lot*". Cooperation is an essential aspect in creating an environment that allows for effective teaching and learning to take place because the understanding is that everyone has to do their fair share (Gravette, 2014: 43) and only joint effort will help the team pull through. The leaders conceded that ensuring that systems are set in a manner that affords development of staff (by offering training and support, as well as sharing leadership) would promote teaching and learning and build strong teams that are sociable and willing to collaborate. Shared leadership lets leaders embrace everyone in their team. Leaders understand that all are capable and competent and with a boost through development, they can collaborate for a common purpose. In this case, for improving performance. Nafukho, et al (2011) allude to the fact that co-operative effort by a leader reassures team members of their significance and as a result inspire confidence. Assurance bestows trust and a conviction to achieve goals. In turn, this enshrines the significance of values laden collaborative leadership.

Creating an enabling climate that allows performance to improve

The prevalent situation within an environment best defines the predominant climate in an institution and may determine the anticipated performance. Gilmer (1966) in Hoy (2010) describes the climate as features that set the organisation apart from other organisations and further that impact people's conduct. What distinguishes the institution in this instance has to be shared values that pre-suppose desirable ambience. An institutional climate involves what individuals desire "as identified by personal characteristics and values" (Van Houtte, 2005, p. 72). The values held and character portrayed determine the mood prevalent and practiced in an institution. Lack of shared values implies that there may be a clash of what is regarded

important, living those vulnerable falling prey to unbecoming demeanours that may cause uncertainty. One official highlighted *"I think the lack of clear guiding principles turn to be a challenge in most of these centres. So leaders have to create a culture of performance by impressing on their staff critical tenets for operations. Only then will everyone pull up their socks and perform*". Values prepare a firm base for an acceptable atmosphere to prevail and for the staff to pull together and perform as expected. They present a sociable space because of the bond build stemming from a belief in the systems within and prevalent climate. Leaders have a responsibility to create an "affective –social climate" in which all stakeholders experience "safety, trust, acceptance, respect, support, connectedness and satisfaction" (Gravette, 2014, p. 16). This will influence how the staff and learners alike feel, relate and respect the set tone. The leadership remains the custodians of a positive ambience that allows everyone to want to perform. Wang *et al*. (1997) in Macneil, Prater & Busch (2009, p. 75) found in their research that "culture and climate were among the top influences in affecting improved student achievement" and further assert that leaders are central to such accomplishment. Leaders of ABET centres desiring to improve performance have a compelling reason to create a culture and climate that boosts efforts and allows performance to improve. Macneil et al (2009) suggest that high performing institutions proved to have influential leaders who "made a difference" to transform their institutions. Setting themselves (leaders) apart and persuading others to perform brings about anticipated results.

Planning for teaching and learning improvement strategies

Planning remains a critical activity for any leadership to succeed in their management. It is a methodical process of designed actions for achieving a suitably prepared purpose (Gboku & Lekoko, 2007). In an education context (underperforming ABET centres in this instance), preparing, scheduling, designing, forecasting (setting targets) and development are critical components of achieving success in teaching and learning. One respondent was of the view that "*being knowledgeable and understanding what needs to happen and when, is important. It's all about good planning and communicating that plan. Then effective teaching and learning can take place*". Approaches to ensure that quality teaching happens so that learning happens promote high academic performance. The planning process itself is a collaborative process whose product embrace it through a collective owing to shared involvement. Principles of planning include (1) "functionalism" and proximity of its application (extent to which teaching and learning happens and how often); (2) appropriateness and problem-based (suitability of the plan and its viability to solve problems); (3) involvement and team work (partaking in activities and collaboration when actualising the plan); (4) continuously assessing progress (monitoring and evaluation in order to review where necessary); and (5) making decisions (resolutions based on results acquired) (Gboku & Lekoko, 2007). These principles form part of the core responsibilities of leadership not withstanding resource planning.

Consideration for resource provisioning has to be suitable for purpose and (where necessary) developing both educators and learners in relation to this purpose inspire teaching and learning process. Attention has to be cast on addressing the cultures, beliefs, values and

practices, together with gender issues, so that material is inclusive and caters for diverse needs of learners. The relative requirement of social forces and institutions determine structuring of resources. This relates to the affordability or otherwise. The available quantile menu determines the resourcing value proposition in relation to teaching and learning. However, one manager said, "*I don't think the norms and standards for funding are followed completely with ABET as it is the case with schools*". A quintile divides the items of a frequency distribution into five classes. In a case of ABET centres, managers have to ascertain a fair classification is used. This process will assist them to procure and distribute resources equitably. Their responsibility is to defend the frequency grading in order for appropriate allocation from DBE to happen. According to van Jaarsveld, Mentz & van der Walt (2016) the current form of education system was intended at instituting an even system of education in relation to the socio-economic infrastructure and post provisioning by applying same values and principles. ABET managers should consider applying values and principles akin to the norms and standards set when planning for teaching and learning.

Instilling values that will make work diligence compelling

Aspects influencing values management mainly support significant deeds concerning people's lives (Mavimbela & Van Niekerk, 2016). Leaders in ABET centres need to implement practices appropriate to adults' personal development in the manner most appropriate to them. Because these centres service mainly African adults, it is appropriate to design practices in a way they will best associate with. Effective, leadership development in Africa must be rooted in the influential cultural heritage (Malunga, 2009). Generally, the underpinning manner to raise children in the African culture is through instilling appropriate values to inculcate acceptable conduct (Ramphele, 2012). It is believed that growing up, these values will permeate throughout adulthood. ABET centre managers can rise to the opportunity and evoke these practices by way of inviting stakeholders to collectively initiate agreeable values. One of the centre managers said, *"We all value something and tend to hold on to what we value. Therefore, I think starting from common things we, value will assist in developing mutual values. From there we have to agree on the vision. It must also be what all of us want. I think from there it will be better for me to remind people about these values when we have challenges. They will cooperate because that's what they value".* Establishing a cooperative climate require common ground. Values provide a fertile ground for this and form the basis for successful implementation of activities. ABET managers can establish credibility and authenticity with all stakeholders by showing competence to lead through sharing peculiar beliefs about what constitutes worthy teaching and what stakeholders can expect. They should also share their expectations and make stakeholders feel that they are keen to cooperate and support them (Nafukho et al, 2011). *"I always remind myself of Ubuntu value and ask staff that we should respect each other and work together. I also think everyone sees that good morals will help us achieve"*. Collectively, they (centre managers and stakeholders) have to acknowledge that they are in a mutual relationship of improving performance. Despite the fact that there is instability as a result of educators seeking employment in mainstream schooling system, the established values have to be the stabilising

factor in creating a performance driven environment and compelling moral obligation (Setlhodi-Mohapi, 2013).

Lack of prowess in adult education practice and limited participation in CPTD

The prerequisite to change is realising that there is a need for some form of improvement. In this instance, at both personal and institutional level. There has to be an introspection by managers of ABET centres (at a personal and institutional level), to reflect and inwardly examine their own contribution and that of others to the situation in their institution. Once they have established the facts, there is a need to come up with an improvement strategy. One centre manager acknowledged, *"Besides planning for teaching and learning, I think we must also plan for personal development and institutional development. Although, IQMS (Integrated Quality Management System) is there to support our development, it is not properly implemented. We do it for compliance. So, I think we should take development seriously. If I develop and others develop, together we can develop our institution. For me that is vital".* Malunga (2006, p. 2) confirms that collective owning up of challenges, chances offered, and responsibilities set up prospects that encourage embracing opportunities. Moloi (2005) sets out those institutions that learn embrace a system-thinking approach to matters concerning their institution, relationships and challenges. Taking a considered approach towards their situation and steps towards acquiring knowledge and skills (specific to ABET practice) necessary to perform encompasses valuing work and desire to develop. If leaders embrace values that inspire growth and consideration of others, their staff will emulate the moral obligation and thus become morally accountable. Inspiring institutional ethos influence overall moral conduct and empower staff to make a difference. Christie (2010) aptly states that successful leaders focus on development, that build a vision; set goals; stimulate staff intellect, provide support; model good performance; have high expectations in others, create a culture of development and incorporate everybody's ideas when developing plans for the institution.

Conclusion

Decisiveness, collaborative teams, enabling climate, planning teaching and learning for better and improved performance, instilling values and realising the need for institutional improvement are found to be factors that constitute the role of managers of ABET centres in inculcating shared values that instil collaborative effort to improve and sustain good performance and eradicate underperformance. Shared values, moral obligation and persuasive leadership promote institutional ethos, and sets the wheels of good performance in motion. ABET managers play a key role in becoming moral and core values agents. Values have been shown to be the overall performance improvement enablers that thrust forward peoples' energies and build an affective-social climate that considers stakeholders' relations and seeks to build social capital. For that reason, ABET managers' role is to support adult learners development by initiating common strategies based on shared values and an institutional culture that propagates the will to perform. Furthermore, ABET managers have to increase and widen their leadership abilities through personal development.

Findings of this study offer key implications for practice regarding leadership's ability to draw from shared values. There is a need to push for sustained performance within ABET centres and build a firm base for all parties to strive for continued quality performance. To achieve this, leaders have to first, manage better the complexities of leading, teaching and performance improvement by drawing from the agreeable core values; second, support and ensure the implementation of plans that facilitates learning that develops cognitive and affective capabilities (transformational learning), third, explore the notion of participatory leadership through influence and collaboration by using principles that guide collective work; fourth, providing value adding pedagogical leadership that develops social capital to support learning; and finally, support individual growth by encouraging and creating an environment that promotes professional and personal development.

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TEACHING PERSONAL HEALTH FOR SUSTAINABLE DEVELOPMENT AMONG PRIMARY SCHOOL TEACHERS (PSTS) IN UDI LOCAL GOVERNMENT AREA, ENUGU STATE, NIGERIA

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Abstract
Personal health is among health education curriculum contents that aim at equipping the individual with the competence to lead a healthy life for sustainable development. The relevance of personal health to goal 3 of the 17 Sustainable Development Goals (SDGs) makes it imperative to determine the level of teaching at the foundation stage. This study was a survey whose purpose was to determine the level of teaching personal health among primary school teachers (PSTs) in Udi Local Government Area. Two research questions and one null hypothesis guided the study. Instrument for data collection was a 10-item self-structured questionnaire known as Frequency of Teaching Personal Health Questionnaire (FTPHQ), administered on a sample of 112 drawn from a population of 1086 teachers using the multistage sampling procedure. Validation of the instrument was done by 3 experts in Health Education while reliability established using test re-test method which yielded a correlation coefficient index value of 0.89, determined using Pearson's Product Moment Statistic. Data were analysed on item-by-item basis using mean, standard deviation and the t-test statistics. Findings reveal that the level of teaching personal health among PSTs is generally low (x=2.25).Specifically it was found out that the level of teaching care of sense organs (x = 3.40); care of clothes (x = 3.55) and dangers of alcohol (x = 3.41) was high while the level of teaching other components of personal health was low (x < 2.50). Findings also show that the teaching of dangers of alcohol and fighting were dependent on the teachers' teaching experiences (t-cal > t-crit). It was recommended that teachers should be encouraged to show more zeal in teaching personal health among others.

Keywords: Personal health, Positive lifestyle, Sustainable development, Teachers**.**

INTRODUCTION

The United Nations developed a list of 17 Sustainable Development Goals (SDGs) which is intended to guide efforts to reduce poverty and improve health and well-being in all countries by 2030 while protecting the planet. One of the 17 goals (goal 3) relates to health and its target is *to ensure health lives and promote well-being for all at all ages.* Sustainable Development Goals are product of deliberate process of the United Nations involving her 194 member states and contained in paragraph 54 of the UN resolution A/RES/70/1 of 25th September, 2015. It is a replacement of the Millennium Development Goals (MDGs) which ended in 2015 with minimal actualization of the set goals.

In recognition of the importance of SDGs to health, the International Epidemiological Association (IEA) and World Federation of Public Health (WFPHA) sponsored joint sessions on SDGs at both the 20th World Congress on Epidemiology in Anchorage, USA in August 2014 and at the 14th World Congress on Public Health in Kolkata, India in February, 2015. (IEA, 2015). This underscores the need to achieve the goals of sustainable development through teaching. It is believed that 40 percent of premature deaths could be avoided through giving instructions on health related issues (Norhein, Jha, Admasu, Godal, Hum, & Kruk, 2014). One of such health related areas that require instruction to individual for the avoidance of premature death is personal health.

Personal health may mean different things to different people and professionals, based on the difference in the assumptions about health. Briggs (2010) outlined that an individual perceives health as the most precious possession that must not be lost; the physician sees health as the normal functioning of the body; to the psychologist, it is the normal functioning of the mind; the sociologist understands it as the social norms that make people sick; the native doctor interprets it based on the whims and caprices of witches, spirits, voodoo and superstition, and as for the quack, it is a fee payable in advance. These assumptions and beliefs present health from a multidisciplinary perspective, but with a common focus on the individual and wellness, to achieve an optional state of wellbeing.

Personal health therefore, is a state of physical mental, social and spiritual wellbeing in an individual achieved through desirable personal habits. Such personal habits include personal hygiene and healthy lifestyle. Enebechi (2015) admitted that positive lifestyle could help reduce related diseases and ensure wellness. Positive lifestyle is the habit of adopting desirable healthy behaviours for optimal health and well-being. Similarly, it is less likely that disease causing germs can enter our body and cause harm if people have good personal hygienic habits. It then becomes needful that these habits of personal hygiene and healthy lifestyle be developed and achieved in the individual through teaching and instructions. Teaching of personal health will greatly develop health consciousness among individuals.

One of the cardinal objectives of health education is to equip the individual with skills, knowledge and attitudes to develop competence so as to be able to handle and solve their health problems (FME, 2006). It is believed that good personal health forms the foundation on which building of sound community health stands. This is because, when an individual is healthy, the competence to pursue and achieve community development is guaranteed. The Knowledge, Attitude and Practice model (KAP) by Coutts and Hardy (1985) is a suitable theory on which this study anchors. K.A.P theory suggests that the right information will influence attitude and subsequently bring about change in behaviour. The assumption is that when the pupils are given the right information about health through teaching they would adopt acceptable personal hygienic practices for healthy living and well-being. Community development anchors on the SDGs which provides a health window through its goal 3 which is good health and well-being. In pursuit of the cardinal objective of equipping the individuals with competence to handle health challenges, the National School Health Policy

provides for the teaching of personal health in the Skill-Based Health Education Curriculum, (FME, 2006). Personal health curriculum content covers relevant areas such as hygiene of the sense organs; hand washing; washing the clothes; oral hygiene; rest and relaxation; good house space; and healthy lifestyle. Ewuzie (2010) accepted these contents as adequate for information on personal health issues.

Prevalence of hygiene related diseases among pupils raises a suspicious on the level of knowledge and skills possessed by them. It is suspected that the low prestige accorded to teachers may have contributed to the perfunctory attention given to the teaching of health education in schools especially in primary schools. Okeke (2004) observed that the teacher was both a beloved leader and a neglected public servant who was starved unnoticed by the parents of the very children entrusted to his care. Ejifugha and Uwazie (2014) lamented that the present day Nigeria school health teacher has been grossly undermined thereby making him incapable to influence children's lifestyle in matters relating to health. This development has contributed immensely to inability of adolescent to face health challenges and play effective role in community health and including SDGs. The low attention is increased by the current reform of teaching health related topics as integrated subjects such as Basic Science and Social Studies. It is against this background that the level of teaching personal health among primary school teachers needs to be determined. The problem will be that lack of real zeal in teaching personal health among the teachers would be counterproductive to the achievement of sustainable development goal of *ensuring healthy lives and personal wellbeing.*

The choice of primary school is informed by the belief that when you catch them young, you make them slaves. Furthermore, the Holy Book maintained that if you teach a child how he should live he will remember it all his life, (Proverbs 22:6). Inhabitants of rural areas are known to show poor personal hygienic habits, hence the choice of a rural location. The results of this study would be useful in improving the target strategies of SDGs, especially in health related areas.

The teachers who may be male or female share different teaching experiences. Teaching experience was considered in this study because the prestige accorded to teaching profession declines with time. Udi local government area is one of the 17 local government areas that make up Enugu State and it is entirely rural with 82 primary schools organized into 4 zones of Udi, Ngwo, Ojebe Ogene and Affa with unequal number of schools. It is bounded by Igbo-Etiti, Oji-River, Enugu South and Ezeagu local government areas due North, South, East and West respectively. As a rural setting, waste disposal; water source; and cultural standards could expose the inhabitants to the challenges of personal hygienic practices.

It is against this background that the researcher aims to determine the level of teaching personal health among primary school teachers in Udi local government area.

RESARCH QUESTIONS

Two research questions and one null hypothesis were raised to guide the study thus:

1. What is the level of teaching personal health among primary school teachers in Udi local government area?
2. What is the influence of teaching experience on the level of teaching personal health among primary school teachers in Udi local government area?

RESEARCH HYPOTHESIS

Ho_1: Teaching experiences will exert no significant influence on the teaching of personal health among primary school teachers in Udi Local Government Area.

METHODS

The descriptive survey design was adopted for the study. The chosen design describes situations as they currently exist and has been successfully utilized in a similar study on status of teaching. The population of the study comprised of 1086 teachers in the 82 primary schools in Udi Local Government Area (LGEA, 2016).

Multistage sampling procedure was adopted in drawing the sample for the study. First stage was clustering of the schools into four based on zones to get Udi, Ngwo, Ojebe-Ogene and Affa zones. Second was purposive selection of 2 schools from each zone to produce 8 schools. The purpose was to select schools whose staff nominal will are up to 20 teachers to enable the sample provide for adequate spread in teaching experiences. Third and final stage was drawing of 14 teachers from each of the 8 schools using the systematic sampling technique to produce 112 teachers who served as the sample for the study.

Instrument for data was a 10 item questionnaire known as Frequency of Teaching Personal Health Questionnaire (FTPHQ) developed by the researcher with four options response of *Always, Often, Rarely, and Never* and validated by three experts in Health Education. The validates who were required to examine the instrument for content and construct validity, were supplied with the purpose of the study and research questions as guide. Test-retest method was used to establish the reliability of the instrument. Few copies of the instrument were administered on PSTs in Ezeagu Local Government Area, a neighboring location that shares similar characteristics with the area of the study, on two occasions at an interval of one week. Pearsons Product Moment Statistic was employed to determine the correlation coefficient value of the two scores which yielded index value of 0.89 and considered as high enough based on Wilson (1989) criteria of interpreting the correlation coefficient index value. Data were collected by the researcher with the help of 3 research assistants. Copies of the questionnaire were distributed to the teachers to fill out and were collected back on the spot. All the 112 copies of the questionnaire were duly completed and qualified for data analysis.

DATA ANALYSIS FOR THE STUDY

Data were analysed using mean and standard deviation on item-by-item basis. The four option responses of *Always, Often, Rarely and Never* were assigned nominal values of 4, 3, 2,

and 1 respectively. A criterion mean of 2.50 was established by dividing the sum of the values by 4 for the purpose of taking decisions. Mean scores of 2.50 and above were interpreted as high level, while mean scores below 2.50 were regarded as low level. The t-test statistics was used to verify the null hypothesis. If t-cal is higher than or equal to t-critical the null hypothesis will be rejected and is accepted if t-cal is less than t-critical table value at .05 level of significance.

RESULTS

Table 1. Mean Scores of Teachers' Responses on Level of Teaching Personal Health n=112

S/N	Item	$\bar{X}$	SD	Decision
1	Frequency of teachers care of sense organs	3.40	.70	High level
2	Frequency of teaching hand washing	1.85	.73	Low level
3	Frequency of teaching care of clothes	3.55	.63	High level
4	Frequency of teaching oral hygiene	1.96	.78	Low level
5	Frequency of teaching mental hygiene	1.86	.77	Low level
6	Frequency of teaching dangers of overcrowding	1.74	.63	Low level
7	Frequency of teaching dangers of alcohol drinking	3.41	.67	High level
8	Frequency of teaching about wise eating	1.71	.62	Low level
9	Frequency of teaching reproductive hygiene	1.77	.68	Low level
10	Frequency of teaching dangers of fighting	1.71	.56	Low level
	Grand Mean	**2.25**	**.68**	Low level

Data in table one show a grand mean of 2.25 which is lower than the criterion mean of 2.50. This implies that the level of teaching personal health among primary school teachers in Udi local government area is low. However, data in the table reveal that care of sense organs, clothes and dangers of alcohol drinking receive high level of teaching among the teachers.

Table 2: Mean Scores of the Teachers' Responses on Level of Teaching Personal Health Based on Teaching Experiences

S/N	Item	Experienced n = 68			Less Experienced n = 44		
		$\bar{X}$	SD	Decision	$\bar{X}$	SD	Decision
1	Frequency of teachers care of sense organs	3.34	0.76	High level	3.50	0.59	High level
2	Frequency of teaching hand washing	1.87	0.73	Low level	1.82	0.72	Low level
3	Frequency of teaching care of clothes	3.53	0.61	High level	3.59	0.66	High level
4	Frequency of teaching oral hygiene	1.87	0.71	Low level	2.11	0.87	Low level
5	Frequency of teaching mental hygiene	1.99	0.72	Low level	1.77	0.83	Low level
6	Frequency of teaching dangers of overcrowding	1.75	0.58	Low level	1.73	0.69	Low level
7	Frequency of teaching dangers of alcohol drinking	3.51	0.61	High level	3.25	0.72	High level
8	Frequency of teaching about wise eating	1.68	0.58	Low level	1.77	0.68	Low level

9	Frequency of teaching reproductive hygiene	1.85	0.71	Low level	1.64	0.57	Low level
10	Frequency of teaching dangers of fighting	1.84	0.47	Low level	1.52	0.63	Low level
	Grand mean	2.31	0.65	Low level	2.27	0.69	Low level

Data in table 2 show a grand mean of 2.31 and 2.27 for experienced and less experienced respectively. These imply that level of teaching personal health is low among both categories of teachers because the mean scores are all below the criterion mean of 2.50.

Table 3: Item-by-item t-test Analysis of Teachers Responses on Level of Teaching Personal Health According to Teaching Experience

S/N	Item	Level of Experience	N	$\bar{x}$	SD	t-cal	t-crit	Decision
1	Frequency of teachers care of sense organs	A	68	3.34	0.76			
		B	44	3.50	0.59	-1.191	1.960	Accept
2	Frequency of teaching hand washing	A	68	1.87	0.73			Accept
		B	44	1.62	0.72	0.351	1.960	
3	Frequency of teaching care of clothes	A	68	3.53	0.61			Accept
		B	44	3.59	0.66	-0.505	1.960	
4	Frequency of teaching oral hygiene	A	68	1.87	0.71			Accept
		B	44	2.11	0.87		1.960	
						-1.638		
5	Frequency of teaching mental hygiene	A	68	1.91	0.72			Accept
		B	44	1.77	0.83	0.933	1.960	
6	Frequency of teaching dangers of overcrowding	A	68	1.75	0.58			Accept
		B	44	1.73	0.69	0.187	1.960	
7	Frequency of teaching dangers of alcohol drinking	A	68	3.51	0.61			Reject
		B	44	3.25	0.72	2.088	1.960	
8	Frequency of teaching about wise eating	A	68	1.68	0.58			Accept
		B	44	1.77	0.68	-0.799	1.960	
9	Frequency of teaching reproductive hygiene	A	68	1.85	0.73			Accept
		B	44	1.64	0.57	1.649	1.960	
10	Frequency of teaching dangers of fighting	A	68	1.84	0.47			Reject
		B	44	1.52	0.63	3.014	1.960	

df = 110; p > .05 *.A=Experienced; B=Less Experienced*

Data in table 3 show that the t-cal of 2.088 and 3.014 for items 7 and 10 respectively were greater than the t-table value of 1.960 at .05 level of significance. Therefore, the null hypothesis is rejected for these items. This means that the level of teaching dangers of alcohol and dangers of fighting is dependent on teaching experiences of the teachers. On the other hand, the t-cal for items 1, 2, 3, 4, 5, 6, 8, and 9 are less than the t-table value of 1.960. This means that the level of teaching care of sense organs, hand washing, care of clothes, oral hygiene, mental hygiene, overcrowding, wise eating and reproductive hygiene is not dependent on the teaching experience of the teachers.

DISCUSSIONS

The results of the study reveal the following findings:

1) general low level of teaching personal health;
2) isolated high level of teaching care of sense organs, and dangers of alcohol;
3) level of teaching personal health was not dependent on the teachers' teaching experiences.

The finding that the level of teaching personal health was low did not come as a surprise to the researcher because lack of interest and real zeal in the teaching of health education has been established by previous studies on challenges facing school health education (Ejifugha, 1999). Similarly, the low prestige accorded teaching profession may have been largely contributory to the attitude to work among teachers and health education teachers. Furthermore, the poor treatment given to primary school teachers as observed by Okeke (2004) cannot be neglected in identifying factors associated with the low level of teaching personal health.

Interestingly, these findings have serious implications for the achievement of goal 3 of the SDGs which have its target on *ensuring healthy lives and personal well being for all at all ages*. The implication is that a foundation error would exist in forming our future generation at primary school level and age. When children begin with poor personal health habits, they may grow with it and would not change from it.

Hand washing which is acclaimed as a potent strategy for preventing diseases is expected to be an inculcated habit in the children at primary school level. A perpetual habit of personal cleanliness would be formed in the pupils when the level of teaching hand washing has become high. It has been earlier stated that positive lifestyle would help reduce related diseases and ensure wellness. Furthermore, disease causing germs and parasites would not get inside the body when adequate and desirable personal health habits are developed in the individuals.

Unfortunately, the low level of teaching these habits at primary school stage sends a damaging signal to not only an individual's well-being but is counterproductive to the actualization of the sustainable development goals. However, the finding that the level of teaching care of sense organs was high is a welcome development. This is because; the sense organs form gateways to learning, thereby providing a good foundation for intellectual development. On the other hand, the finding that the teaching of dangers of fighting is low appear as a surprise to the researcher. This is because violent behaviours such as fighting are the common delinquent behaviours prevalent in schools. The level of prevalence of fighting among pupils in schools should have attracted the need to increase the level of teaching against such behaviours. Frequent increase in incident and cases of violent behaviours among school children in Malta and Nigerian has been lamented by Debono (2004) and Ali (1995).

Furthermore, result of the study show that the level of teaching dangers of fighting was not influenced by the teachers' experiences. One would have expected the experienced teachers to show more concern on the safety of the pupils by teaching against the habit of fighting than the less experienced ones.

SUMMARY AND CONCLUSION

Sustainable development goals (SDGs) could be actualized through adequate level of teaching personal health to pupils. This is because of its perceived contribution to reduction of related diseases, increase in positive lifestyle and ensuring wellness as targeted by goal 3 of the SDGs. Furthermore, it helps to build a lifelong desirable health habits in the individuals at the foundation ages.

Unfortunately, the low prestige accorded the teaching profession in the country has remained an impediment to the achievement of the expected level of interest and zeal among the teachers. There is no significant difference in the level of teaching personal health among the teachers based on their teaching experiences. Teaching of personal health equips the individual with the competence to handle health challenges through adoption of desirable personal health practices for health promotion.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. Teachers should be encouraged to show greater interest/zeal in teaching personal health topics.
2. Health & Physical Education should be demerged from basic sciences at the foundation level.
3. Consistent health inspection during morning assemblies should be enforced and supervised in all primary schools.
4. Teachers should be given more information on the need to teacher personal hygiene among pupils especially hand washing.

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BRIDGING THE KNOWLEDGE GAP IN THE TEACHING AND LEARNING OF SCIENCE SUBJECTS: AN OPPORTUNITY CREATED FOR 'PROGRESSED LEARNERS' IN ONE DISTRICT OF THE NORTH WEST PROVINCE

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Abstract
The purpose of this study is to examine how worthwhile is the opportunity created for Grade 12 'progressed learners' in bridging the knowledge gap during the teaching and learning of two science subjects and how such an opportunity contributes to the promotion of high learner performance in one district of the North West province of South Africa. The study further cross-examines teacher practices in teaching Science subjects in their bid to bridge the knowledge gap in relation to goals stated in the 2015 National Strategy for Learner Attainment framework document. The study adopted a qualitative method and a case study research design to comprehend teachers and learners' thoughts and experiences regarding opportunities created for progressed learners. Purposive sampling was utilised to select participants consisting of 10 schools and two teachers from each school (one Physical science and one Life Science) and 16 teachers (8 Physical sciences and 8 Life Science) who were teaching during winter and summer camps. Data were collected through classroom observations, interviews, field notes and document analysis of teachers' lesson plans and learner tests and exercise books. Teachers were individually interviewed and from each school, one focus group interview (with 5 learners) was conducted. Data gathered from interviews and field notes were thematically analysed using open coding, axial coding and selective coding. Data from documents was analysed using content analysis. The results indicated that teachers who taught during both winter and summer camps used two different techniques for each different camp. During winter camps, the teachers' practices aimed at addressing the knowledge gaps whereas summer camps were taken as 'fire-fighting' contingencies given that progressed learners were already identified as 'at-risk.' The significance of this study rests in recommending teachers who exhibited best teaching practices to work closely with teachers who showed poor teaching practices through twinning.

Keywords: knowledge gap, progressed learners, improved learner outcomes, winter and summer camps.

1. Introduction

Progressed learners' could affect matric pass rate- News24 Headline for 2017-01-04
The field of education is complex and within this multifaceted discipline, issues in teaching and learning often require equally complex approaches to determine appropriate solutions (Swayze, 2009). The starting point of this paper is the acknowledgement of Swayze's (2009) assertion by relating it to the News 24 caption above. The issue of 'progressed learners' is a complex one within the South African educational landscape. Given that the issue is complex, equally complex and appropriate solutions have been and are being pursued by the relevant Department of Education officials. 'Progressed learners' has become the buzz phrase in the South African education system since 2013. This is after the promulgation of

progression of learners' policy in 2013 (Department of Education [DoE], 2016). A of lot changes have taken place in aspects of condoning and promoting learners to the next grade level in the South African education system and the fear is that this process in its entirety could negatively affect the national matriculation pass rate year by year.

Within Circular E35 of 2015, progressed learners are those learners who are over-aged, must have failed the same grade twice and are promoted to the next grade (DoE, 2016). Amongst other requirements, the policy states that

> "the learner must have failed to satisfy the promotion requirements of either Grade 10 or Grade 11 and repeated either Grade 10 or grade 11. The learner must have passed the language of learning and teaching (LoLT) and another three of the seven subjects offered in the school curriculum. The learner must have attended school on a regular basis. Absenteeism in excess of 20 days, without a valid reason, disqualifies the learner from being progressed" (DoE, 2015:1-2).

According to Wicks and Raborife (2017:2) the spokesperson for the Department of Education elaborates that

> "progressing learners to other grades is to ensure learners do not get frustrated and drop out. It allows them to stay in the system. However, progressed learners must still meet the requirements of the NSC to pass. They are not pushed through."

Thus to the DoE officials, if a learner fails a grade twice, there is no value in retaining the learner in that grade. Instead, the learner must be progressed and supported in terms of the knowledge deficit that the learner has accumulated over the years. This scenario presents complex issues in the teaching and learning process equally requiring complex approaches to render appropriate solutions as alluded to by Swayze (2009).

1.1 Background

In order to understand the background in which this study was undertaken, it is necessary to describe the context of the 'progressed learner.' The National Development Plan (NDP) directs the Department of Basic Education (DBE) to mediate the high drop-out rate of learners from the basic schooling system by increasing the learner retention rate. In response to this call, Minister of Basic Education, Angie Motshekga, noted that South Africa introduced the 'progression' policy so as to increase the learner retention rate to 90%, and allow for an increase in the number of learners entering vocational and occupational pathways (Matshediso, 2017). The DBE encourages provinces to progress or condone learners who have repeated Grade 11 more than once, who are over-aged and give them extra support to sit for Grade 12 National Senior Certificate examinations (Wicks & Raborife (2017).

Given this background, the DBE introduced three circulars that focus on the criteria for the implementation of progression in Grades 10 to 12, namely Circulars E35 of 2015, E03 and E22 of 2016 (DoE, 2015, 2016). As highlighted by the Minister of Basic Education, the progressed learners must be supported in terms of the knowledge deficit that they have accumulated over the years (Matshediso, 2017).

The DBE has tasked provinces to design their own programmes to address this knowledge deficit. This study has coined the phrase bridging the gap for this practice where a connection is made between the great difference in the status quo and the expected result. The Department of Education's 2015 National Strategy for Learner Attainment (NSLA) framework has two objectives which directly speak to the purpose of this study. These are sustained improvement in learner performance and improved support for teaching and

learning. It is imperative that teachers bridge the knowledge gap in order to keep up with this objective. For the North West province, this gap is bridged by running winter and summer camps for the progressed learners.

However, studies on science education summer camps that examine improvement of cognitive outcomes are sorely lacking (Williams, Ma, Prejean, Ford & Lai, 2007), and the paucity of empirical support in the value of these experiences impacting upon content learning is deeply concerning. Given the significant numbers of progressed learners participating in South African science camps, in part for academic enrichment in science-related subjects, a better understanding of the gains made from such short-term experiences is warranted. The study examines and interrogates teacher practices in their bid to bridge the knowledge gap in science subjects in relation to the goals stated in the 2015 NSLA framework document. The following were the research questions that guided this investigation (1) how worthwhile is the opportunity created for the Grade 12 progressed learners in bridging the knowledge gap during the teaching and learning of two science subjects? and (2) how does this contribute to the promotion of good learner performance in one district of the North West province of South Africa?

The Intervention

In a bid to reduce the impact of progressed learners in dropping pass rates of individual subjects, and the overall pass rate of the province, the North West Department of Education (NWDoE) decided on an intervention programme for its progressed learners in one of its four districts (Ngaka Modiri Molema) which was performing well. The district has 5 Area offices. Each Area office was requested to compile a list of progressed learners so that these learners would participate in two 2-week science camps. The first camp, commonly known as the winter camp, was held immediately after schools closed during second term, running end of June to July. The second camp, commonly referred to as the summer camp, was held immediately after schools closed during third term, running end of September to October. The DBE identified 5 subject areas, namely, Physical Sciences, Life Sciences, Mathematics, Economics/Business Studies and Agriculture for intervention. Five centres were identified. The NWDoE selected its 'best teachers' for individual subjects from the province which it appointed to run the camps. The teachers were selected based on their track record of producing excellent results in individual subjects they teach over time in their schools. Two university academics (one male and one female) specialising in Life Sciences and Physical Sciences took part in the evaluation of the intervention and were further involved in the second phase.

2. Theoretical Framework

Stufflebeam's (2003) Context, Input, Process and Product (CIPP) evaluation model which provides timely information in a systematic way for decision-making and accountability purposes guided this study. This approach for evaluating projects falls under the improvement-and accountability-oriented evaluation category. The category is oriented towards determining the merit and worth of the project being evaluated in this case, one winter and one summer camp and teaching activities which followed after the summer camp. According to Zhang, Zeller, Griffith, Metcalf, et al., (2011), the CIPP evaluation model is systematically designed to guide both evaluators (two researchers) and stakeholders (NWDoE, teachers and learners) in posing relevant questions and conducting assessments at

the beginning of the project (context and input evaluation), while it is in progress (input and process evaluation), and at its end (product evaluation). Figure 1 illustrates the model.

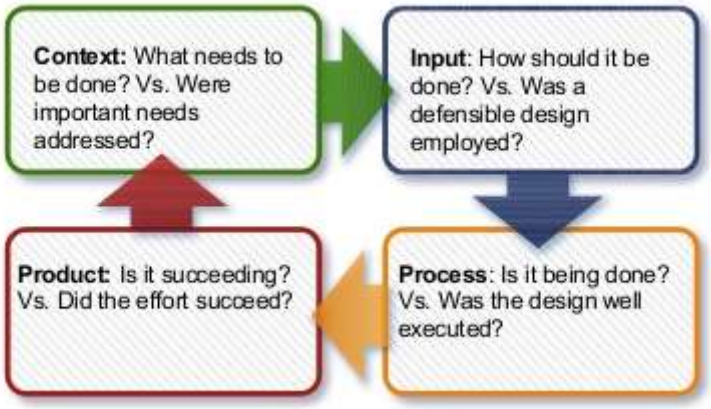

Figure 1: The Context, Input, Process and Product (CIPP) evaluation model

As indicated on Figure 1, under Context evaluation, questions raised include: What needs to be done, versus, were important needs addressed? (Stufflebeam & Shinkfield, 2007). The methods for context evaluation include document reviews, secondary data analyses, interviews and diagnostic tests. The Input evaluation component asks, "How should it be done?" (Zhang et al., 2011:64) and identifies procedural designs and educational strategies that are most likely to achieve the desired results.

Process evaluation is the third component which asks, "Is it being done?" (Zhang et al., 2011:65). Process evaluation includes on-site observation, participant interviews, focus group interviews and self-reflection with participants. The fourth and last component is Product evaluation which assesses project outcomes, and asks, "Did the project succeed?" (Zhang et al., 2011:66). The purpose is to measure, interpret and judge a project's outcomes by assessing their merit, worth, significance and probity.

3. Research Design

This qualitative study is exploratory, descriptive and interpretive (Creswell, 2013). The study utilised the constructivist interpretive qualitative paradigm to comprehend and interrogate teachers' and learners' thoughts and experiences regarding opportunities created for progressed learners. This design was useful in gaining understanding of a circumstance (Henning, Gravett & Van Rensburg, 2002), and in this case, the issue surrounding progressed learners.

3.1 Population

Four hundred and fifty-six Grade 12 progressed learners (256 male and 200 female) identified by their 5 Area Offices in the Ngaka Modiri Molema district of the North West province of South Africa attended both the winter and summer camp in 2016. The learners were selected from a total of 94 Further Education and Training (FET) schools. Of the 456 learners, 256 were Life Sciences and Physical Sciences learners combined. From the 256, 148 were doing Life Sciences and 108 were doing Physical Sciences. The learners were divided into 10 different camps. Each Area office had two summer camps in which there were also learners getting coaching for other subjects. Physical Sciences and Life Sciences learners were distributed in 8 camps as the other two camps were dedicated for Commercial subjects.

3.2 Study sample

Participants.

The sample consisted of twenty teachers (10 Life Sciences and 10 Physical Sciences) who taught in both winter and summer camps. The teachers were purposively sampled in the sense that the teachers were teaching Life Sciences and Physical Sciences in the camps. A total of one hundred learners (50 Life Sciences and 50 Physical Sciences) were randomly sampled for focus group interviews during the camps. The second phase of the study involved visiting the learners when they were back in their usual schools and a total of twenty teachers (10 Life Sciences and 10 Physical Sciences) were once again purposively selected. These teachers were observed teaching once and interviewed once. The same learners who participated in focus group interviews during camps for the last time participated in focus group interviews which were conducted at their school.

3.3 Instruments

In order to capture the lived experiences, perspectives and knowledge generated by the teachers and learners, data were collected using classroom observations and semi-structured interviews (individual with teachers and focus group with learners). Classroom observations were focused on how the 'best teachers' conducted their lessons with the progressed learners. Documents were gathered for analysis: learner exercise books, tests, class registers and record books to establish both quantity and quality of exercises given by the teachers as well as the general performance and frequency of attendance.

Reige (2003) emphasises the importance of ensuring the reliability and validity of a research study. A number of quality measures for qualitative studies are mentioned (Merriam, 2002). These include credibility, transferability, trustworthiness and confirmability. Firstly, to study the phenomenon, the participants were drawn from a cross section of school contextual settings in order to enhance the transferability of the findings of the study. Secondly, credibility was ensured by providing descriptions of the winter and summer camps school research participants and the data collection methods. The description of the camps included identifying the activities that the teachers and learners were observed participating in. Additionally, the arguments were developed logically and systematically from the study findings. Thirdly, the trustworthiness was ensured through the use of more than two data collection tools through a process called triangulation (Cohen, Manion & Morrison, 2011). Lastly, the confirmability of the study findings was achieved partly through triangulation and member checking. The findings from the camps were taken back to the teachers and learners to confirm the data collected.

3.4 Data analyses techniques

Adopting a grounded approach and moving between predictive and inductive analytical techniques, the two researchers conducted open coding and later axial and selective coding, as they first identified concepts and codes, and then reduced them to categories and subsequently themes (Creswell, 2013). We then focused on those themes that referred to context, input, process and product categories as observed from the evaluation of both the winter and summer camps as told by the teachers and learners. ATLAS.ti version 7.5.10 was used for sorting the themes. Data from documents was analysed using content analysis. The ultimate aim was to establish if the opportunity created for the Grade 12 progressed learners in bridging the knowledge gap during the science camps contributed to the promotion of good learner performance in one district of the North West province.

4. Results

Themes were identified under each of the four evaluation components. Results are reported first for context evaluation. The theme identified was that of assessing problems, assets and opportunities. The study established that putting progressed learners into camps was one of the many alternative solutions which would alleviate the DBE's concern of progressed learners pulling down the pass rate in individual subjects and the overall pass rate for the province. In other words, the camps were a purposive, custom-tailored and conducive environment for the progressed learners to get facilitation and assistance. As these were learners already identified as 'at-risk', the summer camps were 'fire-fighting' contingencies.

Under input evaluation, focus was on identifying procedural designs and educational strategies that were most likely to achieve the desired results. From our analysis, informed by our observations and tours of the camps, the planning was good and well-thought out. All resources and materials such as furniture, revision material, past examination question papers and food were made available and satisfactory in our assessment. We were also convinced with the scheduling of events during the camp as more time was dedicated to serious academic business and there was no time-wasting. Time was spent on task.

Results regarding the last component product evaluation addressed the educational strategies; one theme was that of teacher's knowledge of the subject. Teachers teaching in the camps had a good grasp of content knowledge of Physical Science as a subject and this was verified. In all the lessons the researchers sat in, they enjoyed the display of content mastery by the teachers. They did not stammer. In their response to how do they display such good content mastery; they revealed that they research ahead of conducting lessons.

Learner interviews corroborated these teacher responses. They went on to elaborate other aspects, but critically, they observed a difference in practice and content knowledge between their teachers and those facilitators in camp.

Though the learners felt they were equipped with knowledge they needed to face the end of the year examinations, one teacher back at schools had this to say:

> It is impossible for a learner to do well in a grade they don't deserve to be in. The policy of progressing learners who have failed is not working for both teachers and learners – it should be totally scrapped. (Physical Sciences teacher, School B).

An observation that the researchers made during the focus group interviews was the team-work spirit at the camps. The teachers shared the challenges they encountered in classrooms at the camp, in comparison to their own school experiences. It was quite impressive to note how these teachers empowered one another through their community-of-practice talk.

Creation of opportunities to learn was yet another theme that emerged from our data. The teachers addressed misconceptions which mostly emanated from language barrier; eliminated wrong answers with reasons and created a way for the learners to synthesise information. The opposite was confirmed during classroom observations when the learners had returned from the summer camps.

The last theme that emerged from the data was assessment strategies. On-going assessment came out as one of the strategies which could be employed by teachers for improving results. The observations we made showed that this is one technique all teachers in the camps used. Learners were exposed to past examination questions and had to write assessment exercises

and tests. These exercises also gave the teachers an indication that most of the learners in the camp lacked sufficient background knowledge linked to certain concepts.

In terms of establishing the worthiness of the opportunity created for the Grade 12 progressed learners in bridging the knowledge gap during the teaching and learning of two science subjects, the project achieved this objective to a less extent. Table 1 gives the results of the progressed learners from the ten schools.

Table 1: Results of progressed learners for the 10 schools

School	Life Sciences % pass rate	% of progressed learners who passed	Physical Sciences % pass rate	% of progressed learners who passed
A	42.7	6.9	25.8	2.0
B	41.1	5.7	43.3	3.7
C	37.6	5.8	45.9	3.8
D	34.4	4.6	33.7	2,1
E	51.8	7.8	43.3	3.2
F	34.1	4.0	42.0	2.9
G	41.3	6.6	29.1	1.1
H	38.8	4.7	36.5	1.9
I	41.7	3.8	30.1	1,3
J	36.4	2.7	28.6	1,2

As can be seen in Table 1, some progressed learners indeed contributed to the pass rates of indicated schools. It can be said that assistance rendered to progressed learners in the science camps might have helped in them passing. Though the percentage pass rates for the two subjects are not that high, there is a substantial number of learners who passed. As can be inferred from Table 1, progressed learners did far better in Life Sciences than Physical Sciences. In her 2017 Matriculation announcement speech for the 2016, the Minister of DBE alluded to the fact that the North West province had the second highest percentage pass rate of progressed learners at 61.1% and congratulated efforts made by the provinces.

For the summer camps, observations revealed that teachers drilled learners for examinations. Focus was on drilling even though we as researchers assert that drilling learners for examination purposes is a not good pedagogic practice. The finding that drilling was commonplace is therefore rather disappointing and brings disquiet surrounding ‘best practices’ which teachers in poor performing schools might want to adopt. Pertaining to promotion of good learner performance of progressed learners, the summer camps achieved this part-objective to a moderate extent. We say so because learners were taught skills such as question interpretation and identification of the demands of the question, including critical aspects which learners need to know when responding to a question. That to us could promote good learner performance hence the quirky conclusion that the objective was moderately achieved. Interviews held with teachers and learners as well as document analysis provided evidence for us to reach the decision of moderate achievement of the objective. For that reason, we concluded that these results are fairly encouraging.

5. Discussion of Findings

The finding that the planning of the camps was good and well-thought out is in agreement with Antink-Meyer et al.'s (2014) findings which showed that planning plays an important part if the outcomes of a project are to be fruitful. The finding that putting progressed learners into camps was an alternative solutions which could alleviate the DBE's concerns over progressed learners lowering down the pass rate for individual subjects and the overall pass rate for the province has important implications. However, this result has not been previously described. When it comes to teachers in the camps, one can tell that issues of subject management and leadership were not a problem. However, the teaching approach utilised during the summer camps - drilling - contradicts the essence of good and efficient pedagogic practices. This approach is similar to the one used in a study by Williams, Ma, Prejean, Ford and Lai (2007), which aims at addressing the misconceptions, eliminating wrong answers with reasons and creating a way for the learners to synthesise more information in the hope of also inculcating interest in science subjects. Questions remain lingering about the efficacy and the extent to which such an approach could be perceived as participatory, robust and sufficiently interrogative in the discourses of science pedagogy (Antink-Meyer et al., 2014) through camps.

Regarding process evaluation, it can be argued that the implementation process of the intervention went well. The finding that everyone was on task all the time and no time was lost is also encouraging. However, the findings regarding product evaluation were a mixed bag, some disappointing and some promising. This is common in the evaluation of projects as highlighted by Zhang et al. (2011). Finally, the CIPP model enabled the researchers to evaluate the intervention's needs assessment and planning, monitor the process of implementation, and provide feedback and judgement of the intervention's effectiveness for continuous improvement. Indeed, as suggested by Stufflebeam & Stufflebeam (2007), the CIPP model was a good improvement- and accountability-oriented evaluation tool to address the 2015 NSLA framework objectives.

In conclusion, the purpose of the study was to establish how worthwhile the opportunity created for the Grade 12 progressed learners was in bridging the knowledge gap during the teaching and learning of two science subjects and in contributing to the promotion of good learner performance in one district of the North-West province of South Africa. The CIPP evaluation model which emphasises 'learning-by-doing' was uniquely seen as suitable for evaluating the winter and summer camp intervention as well as teaching after the camps and utilised as the theoretical framework for the study. Regarding the purpose of the study, we concluded that the project achieved this objective to a lesser extent given the results presented in this article. Pertaining to promotion of good learner performance of South African Grade 12 progressed learners, we established that the intervention achieved this part-objective to a moderate extent. In future investigations, it might be possible to follow the teachers who were teaching in the camps to identify the practices they employ in their everyday teaching. Some of these teachers' practices might be categorised as best practices which the study sought to establish. The study recommends that progressed learners need continuous and special attention not just winter and summer camps which are two-week interventions.

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PEOPLE FIRST: THE DECOLONISATION OF HUMAN RESOURCES PRACTICES IN HIGHER EDUCATION INSTITUTIONS IN GHANA

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Abstract
There is no model for human resources management in the public higher education institutions in Ghana and for that reason human resource practices follow what was inherited from the colonial masters where the needs of staff are not so much of a priority. Instead of developing and managing human capital for retention the colonial human resources practices inherited by the higher educational institutions focus mostly on recruitment and placement of staff with less interest in strategies to train and develop them to be the human capital bases for the institutions. In an era of war on talent, most higher educational institutions loose the most knowledgeable and experienced academic employees because of lack of strategies to train, nurture and retain them. In Africa, organisations that want to be ahead of others should put the needs of employees first. This paper advocates for an African value of putting people first in human resources development and management to retain human capital. As a human resource practitioner in a public higher education institution in Ghana for two decades this researcher has realized the need to make a paradigm's shift to people-centred human resource practices. That is, the institutions should decolonize human resources practices in the higher education institutions by recognising the value of academic employees as a strategy to make them more committed to the employer. The study employed qualitative research method in the form of interviews in data collection. It revealed that making human resources more people-centred can ensure staff commitment, increased productivity and retention; things institutions cannot take for granted.

Keywords: human capital, people-centred, decolonisation, Africanisation, colonialism, paradigm's shift, retention.

Introduction

The higher education institutions in Ghana do not have their own model for human resources management. In the absence of such a model human resource practices in Ghanaian public higher education institutions follow western human resources culture and practices, i.e. what was inherited from the colonial masters where the needs of academic staff are not so much of a priority compared to the institution's agenda. Instead of developing and managing human capital as asset for retention and sustainability the colonial human resources practices inherited from the West focus on recruitment and placement of staff. Public higher education institutions in Ghana, particularly the universities seem to be less interested in strategies to train and retain human capital in the form of experts, researchers and best academics who could carry and maintain the image of the universities as institutions of higher learning. In an

era of war on talent, most universities could often lose the best, knowledgeable and experienced academic employees because of lack of strategies to train, nurture and retain them. Very often such best brains can be poached by other universities which provide academic employees with better conditions of service.

In Africa, organisations, including higher educational institutions that want to be ahead of others put the needs of employees first and this is what Ghanaian public educational institutions such as the universities have to do in order decolonize their human resources practices. This paper advocates for an African culture of putting people first in human resources development and management in Ghanaian higher education institutions, particularly the universities as a strategy to realise the commitment of staff and retain them as human capital base for the institutions. As a human resource practitioner in a public university in Ghana for over two decades this researcher has realized the need to make a paradigm's shift to people-centred human resource practices. That is, to decolonize human resources practices in the public higher education institutions in Ghana to arrive at a situation where employees are valued, recognised and made aware that they are indeed part of the institutions they work for. The study employed the qualitative research approach in the form of interviews in data collection. The analysis of the data revealed that making human resources more people-centred can ensure staff commitment, increased productivity and retention, things higher educational institutions such as the public universities cannot take for granted.

Theoretical Framework

This paper is grounded in the African philosophy of *Ubuntu.* The term *Ubuntu* is a Zulu word meaning humanness, love, kindness, support or cooperation. Ubuntu is seen as traditional African concept which in English translation means "humanity towards others" 'I am because we are; a person becomes human through other person'. It also means a person is a person because of other persons (Boaduo & Quan-Baffour, 2011, Poovan, 2005; Mbigi, 1997). The philosophy of Ubuntu indicates that a person is a person through other persons and no one is an island unto himself. *Ubuntu* is uniquely and proudly African and its origins can be traced back to the traditional indigenous societies living in South Africa where the people led communal lifestyle (Broodryk, 2002). Traditionally, African communities lived together and shared symbiotic relationships with each other. Broodryk (2002) and Mbigi and Maree (1995) share the common belief that the origin of *Ubuntu* lies in communities which were underprivileged, poor and could not survive on individual efforts alone. No man is an island unto himself and in order to survive the members of the indigenous and rural African communities shared basic human needs such as shelter, food and water. Poovan (2005) affirms that *Ubuntu*, originated from Nguni language family, which comprises of Zulu, Xhosa, Swati and Ndebele. *Ubuntu* as a philosophy and praxis developed along deep spiritual lines within the traditional indigenous African family system. *Ubuntu* has become a way of life that Africans believe in, trust and practice in their daily interaction with others (Pooven,

2005). Nelson Mandela (2006), described *Ubuntu* as a philosophy constituting a universal truth, a way of life, which underpins an open society.

The philosophy of *Ubuntu* portrays an African world view of unity, respect, care and love for fellow human beings no matter where they come from. As humans we lead gregarious lives where we are connected to others (Quan-Baffour, 2014). This is an affirmation of the fact that one is a human being because of being with other human beings. In practical terms without others we cease to be human. Human life is defined in terms of our relationship with others hence the needs to cooperate, share, love, respect and have compassion for others. To be human is to affirm one's humanity by recognising the humanity of others in its infinite variety of content and form (Quan-Baffour, 2014). The individual is not just a social being but a being inseparable from the community. Individuals are born into the community and they are physically, spiritually and emotionally attached to the community and will always remain part of that community till death.

Louw (2006) asserts that *Ubuntu* inspires us to expose ourselves to others; to encounter the differences of their humanness, so as to inform and enrich our own. This indigenous philosophy illustrates how the individual African is anchored with a community and connected to the members of the community (Poovan, 2005). In other words, if we are to be human then we need to recognize the genuine otherness of our fellow citizens, acknowledge the diversity of languages, histories, values and customs; all of which constitute the African society (Louw, 2006).

The philosophy of *Ubuntu* (humanness) has important implications for human resources management in higher education institutions in Ghana. It implies that Africans should look at whether what they are doing will enable or empower the community around them and help it to improve. The philosophy indicates that if an organisation treats its employees humanly they are likely to reciprocate by being committed, loyal and performing better. The *Ubuntu* philosophy implies that one can only increase one's good fortune by sharing with other members of the society and thereby also enhancing their status within the local communities (Broodryk, 2005). This therefore simply means orgainisations like the universities which want to be ahead of others need to embrace their staff, especially academics, treat them humanly to ensure their commitment and loyalty to the employer**.** Under African governance and management practices, respect, dignity, caring, and sharing are considered critical values that build African communities (Bekker, 2006) and Poovan et al., 2006).

The fundamentals of sharing, love, cooperation and compassion are prevalent in most African communities because true Africans do not discriminate against anyone in terms of language, tribe, religion or background. The attributes of *Ubuntu* show that an African society, which is humanist in nature, is also more community-based and socialist than Western society. Socially, organisations such as higher educational institutions may be motivated to train their employees using *Ubuntu* as a philosophy, because doing so can help African organisations to develop a better understanding of African society and their roles as an integral part (corporate

citizens) of that society. The positive attributes of *Ubuntu* also demonstrate what an organisation can gain in terms of understanding the seriousness of embracing a corporate conscience that is in line with African society (Kangaude-Ulaya & Khomba, 2013).

African culture is very different from Western cultures in many ways; which implies that in an African framework, social and cultural linkages are considered to be a key determining factor for the success of any organisation that operates on the continent (Karsten & Illa, 2005; Mangaliso, 2013).

The theory has lessons for human resources management in institutions of higher learning in that it is people who work to bring about production hence people must come first, before productivity, products, and profits. Once people have been given priority and are treated well in their daily endeavours, productivity, products, and profits may automatically be realized (Kangaude-Ulaya & Khomba, 2013).The Ubuntu philosophy encourages people to work hard within their communities/organisations as a team. In an African organisation, efficiency and competitiveness can be achieved by an emphasis on social well-being rather than on purely technical rationality. By seeing people as humans whose efforts increase productivity workers will be proud to be part of the institution and work with dignity because they are not regarded by management just as numbers.

The emerging African human resources management practices should regard the higher education institution such as the university as a community of people made up of workers with a common goal. An African '*Ubuntu*' management system must recognise the significance of group solidarity that is prevalent in African cultures acknowledging that an African leadership style involves group and community supports, sharing and cooperation. Ubuntu-based leadership dictates sharing burdens during hard times, because by doing so, suffering is also shared and diminished (Mbigi & Maree, 2005).

What is distinctive about the Ubuntu philosophy is the premise of a short memory of hate (Mazrui, 2001). Africans teach children to communicate effectively, reconcile, and find ways to cleanse and let go of hatred and give children the skills to do so. The *Ubuntu* approach to life enables people to express continued compassion and perseverance within communities and institutions (Kangaude-Ulaya & Khomba, 2013). Thus both employers and employees should live and work as families where conflicts could be solved peacefully or amicably for the sake of the institution's progress.

In this regard African human resource practices that should be grounded in compassion, love, cooperation and humanness should apply the philosophy of *Ubuntu* with its original good intentions (Tambulasi & Kayuni, 2005). The application of the *Ubuntu* philosophy should be in harmony with the good governance principles of institution of higher learning. Human resources practitioners and employers must not divorce their human resources management from the teachings of *Ubuntu* or pay lip services to it.

In Africa, the traditional heritage in many regions reflects the cultural norms of working together, developing a sense of co-operation, and helping one another in times of adversity and prosperity. Supporting the family is a symbol of solidarity and the interests of the family are always a priority (Mwenda & Muuka, 2004). Thus, if an organisation can function as a kind of community or family, similar employee values can be harnessed through the development of that sense of honour and good relationships with employees, as family members of the organisation.

Problem Statement

In the wake of competition (war of talent) universities face the challenge of retaining the best academics. If universities are to retain the best academic staff then they need to Africanise their human resource practices. This study was set up to investigate the ways and means of Africanising the human resource practices in order to retain their best academics.

Objective of the study

The objective of this study was to explore African human resources management practices that recognize the values of employees make academics more committed and remain with the employer.

Research questions

This study aimed to provide adequate answers to the following research questions.

- What are the practices of human resources in higher education institutions in Ghana?
- In which way can human resources practices in higher education institutions in Ghana put people first?
- How can human resources practices in higher education institutions in Ghana be decolonized?

Assumptions

The study was based on the following assumptions:

- Human resources departments in higher education institutions in Ghana follow the colonial practices which are not in tandem with African values.
- Decolonization of human resources practices in higher education institutions in Ghana can mend employer-employee relationship because the latter may be treated humanely and that can increase their commitment to the employer.

Research Design and Methodology

This was a qualitative research study which took the form of ethnographic investigation. Ethnographic study seeks and explicates the experiences of the participants in order to bring out meanings they assemble to specific issues (Johnson & Christenson, 2000).The ethnographic approach allows participants to talk freely and candidly about their lived experiences and that can enrich the data collected for the study.

The Research Design

From the stand point of the interpretivist paradigm truth is negotiated through dialogue because there is no single way of arriving at the truth. The researcher therefore employed the interpretivist paradigm which is in line with the philosophy of *Ubuntu*; the conceptual framework for the study, and the ethnographic approach to data collection. The philosophy of *Ubuntu* is aligned to interpretivist view point in that humanness can only be expressed through social interaction i.e. dialogue where participants are allowed to discuss their experiences of a particular situation. It is through good human interaction that academics in the public higher education institutions such as the universities and their employers can understand the needs of each other.

Ubuntu practice deals with good human interaction and relationship and this can be realised through the qualitative – ethnographic research methods. Through genuine human interaction based on dialogue the experiences and the perception of the people being studied can be captured in order to obtain an accurate 'measure' of reality. In practical terms a researcher can only solicit meanings from those being studied; he or she cannot impose it (Wiserma & Jurs, 2005).

Population and Sample

This study was on the public higher education institutions in Ghana but for logistic and time constraints the researcher focused on three public universities, one (1) from the coastal area and two (2) from the hinterland. It was assumed that the human resources practices in the three (3) public higher education institutions were similar to the other seven (7) and the findings of the study from the three (3) could be of value to the rest. The researcher used simple random sampling technique to select the three (3) public universities as sites for the study. The researcher used the same method to select ten (10) academics and human resources staff (made up of the lecturers, senior lecturers, professors and assistant registrars) from each of the three (3) universities, making the total participants thirty (30). The researcher used the fallowing eligibility criteria to select the participants. The participant in the study should be;

- academic staff members and human resource staff (i.e. lecturers, senior lecturers, professors or assistant registrars)
- at the particular institution for at least four (4) years.

The above criteria were used in order to include only participants who were deemed information rich so that reliable data could be obtained for the study.

Validity and Reliability of Instruments

By validity it is meant the extent to which research findings accurately represent what is actually happening in a given situation while reliability relates to the credibility of findings (Welman et al, 2006). Thus, the use of faulty research procedures and data collection instruments can undermine both validity and reliability of research findings. In this study the

researcher took some measures to ensure that both validity and reliability were achieved. In doing so the researcher undertook a pilot study where her data collection instruments were tested on three (3) neutral people randomly selected from one University of Technology. The University was not one of the three selected as sites for the study. Two of the participants in the pilot study were senior academics and one assistant registrar for human resources. Based on the feedback from the pilot study the researcher refined her interview items to make them more focused and without ambiguities. After refining the items she gave them to one senior researcher for further scrutiny before she used the instruments for data collection. The above measures were undertaken to ensure validity and reliability in both the processes and the data collected from the field.

Data Collection

Data were collected through semi-structured interview items with the selected participants. The collection of data which lasted three weeks covered the following items;

- Human resources practice in public universities in Ghana
- The ways and means of putting people first in human resources practices
- How human resource practices can be Africanised or decolonised.
- Views of participants on how they expect human resources to work for them

Data Analysis

After the face–to- face one on one interviews the researcher pruned the data to ensure that incomplete information was deleted. The researcher perused the data and picked up specific ideas that emerged from the interviews. She then arranged the text under four (4) main items used in the interviews. Using the interpretive approach the researcher analysed the data manually and wrote her report.

Results and Discussion

The study was conducted to find out how human resources practices in public higher education institutions, particularly the universities in Ghana, could be decolonised. To solicit the views of the staff both academics and human resource personnel on the topic 30 information rich employees were selected from three public universities in Ghana and were interviewed. The researcher arranged the responses provided by the participants under specific themes, analysed, interpreted and discussed them as follows:

Theme 1: Human resources practices in public higher education institutions in Ghana

Although the 30 participants were interviewed individually they seemed to corroborate in their responses. For example 28 of the participants (80.4%) agreed that public higher education institutions such as the universities follow the colonial human resource practices where issues about employees are dealt with through the top down approach.

The participants agreed in their responses that the human resource departments do not involve academics in finding out their views on issues affecting them. As one participant

who was a senior academic from one of the public higher education institutions said, reproduced verbatim;

> *I have worked in three public universities throughout my 20 years academic career and have observed that human resource departments do not consider academic employees as part of decision makers. They only recruit and place us to work and focus on clerical issues pertaining to annual leave, resignation and retirement.*

The top down approach which is a colonial legacy of human resource practices in public higher education institutions in Ghana are illustrated by the above responses from the participants. The responses indicate that a clear majority of the participants 80.4% (i.e. 28) in public higher education institutions see themselves alienated by the colonial human resource practices that do not put people first. The top-down approach to human resource practices which do not seem to recognize employees as important role players in the institution's decision making curtail loyalty among employees in general and academics in particular.

The 6% (N=2) said they were not happy with the human resource departments in their universities because as they echoed; the human resource sections 'seem to own the universities'. The two participants, one of them an assistant registrar, agreed in their responses that the human resource departments of higher education institutions are too powerful, earn too much salary but do little to project the image of the institutions and the interest of academic employees .

Theme 2: Strategies to put people first in human resource practices

All the 30 participants (100%) agreed in their responses that the human resource departments of the public higher education institutions should put their employees first. However, regarding how this could be achieved the participants were divided in their responses. Twenty two, (22) of the 30 participants (i.e. 73.3%) agreed that to put people or employees first the human resource departments of public higher education institutions such as the universities should always solicit the views of their academic employees on issues that affect them as employees. One participant, a senior academic, seemed to have summarised the views her colleagues when she said:

> *We should be consulted on all major issues that affect our welfare and that of the universities. It is through discussions and interaction that our input for the advancement of the institutions can be realized. Academic employees will always show loyalty when they see themselves as part of the institution.*

The information gathered from the respondents indicate that to make academic employees more committed and loyal to the employer they should feel part of the institution and not just mere workers who only render services for payment.

The other 8 (i.e. 26.6%) of the 30 participants share the view that human resource practices should adopt African approach where community members and members of an organisation or their representatives do need analysis and sit down with the employer to discuss the way forward to advance the goals of the institution . The views of this second group of respondents resonate the first, the majority (N=22), in that they all advocate the need for a dialogue between employers and employees. Such a dialogue could be a break away from the colonial top down human resource practices where academic employees have no input in human resource matters affecting them.

Theme 3: Africanisation of human resource practices

Regarding strategies to decolonize or Africanise human resource practices participants agreed in their responses that the human resource practices can Africanisse their practices by putting people first. Sixteen (16) out of the 30 participants went further to clarify the above response by adding that putting people first means human resource activities should be people-centred, humane, loving, co-operative and supportive.

Fourteen (14) of the 30 participants also agreed in their responses that in order to Africanise their practices human resource departments and practitioners in higher education institutions should often interact with academic employees or their representatives to get their views and inputs on employee wellness.

The above responses indicate a clear consensus among the participants the need to create a warm relationship between human resource practitioners and academic employees of public higher education institutions. As two of the participants, an assistant registrar and a lecturer agreed; reproduced verbatim.

> *We are Africans and we expect the employer to see us as such. In the African way employees need to feel at home in the institution they work for. We should be seen as part of the family of the particular institution and not strangers.*

The above sentiment expressed by the two participants epitomises the discontentment of human resource practices in the public higher education institutions. It is clear from the responses above that the time is up for the colonial top down human resource management style to give way to the people first approach as an Africanised strategy to retain human capital and expertise in the public higher education institutions in Ghana .

The last item requested participants to provide any suggestions on how they thought human resources could best work for them in order to improve human resource management practices in the public higher education institutions in Ghana. The main suggestions made by the participants are listed here below.

- Human resource practitioners should always see academic employees as part of the institution and not just employees selling their labour.
- The colonial human resource practices where human resource departments and personnel see themselves as employers and not employees should stop.

The above view points and suggestions tell that all is not very well with regards to human resources practices in most public higher education institutions because some human resource personnel regard themselves as the employers and not as employees of the institutions. The perception of the 'boss' and the 'subordinate' between human resource departments and academics in higher education institutions in Ghana can be removed if human resource practices adopt African philosophy which puts people first.

CONCLUSION

Public higher education institutions in Ghana were modeled on British higher education system and their human resources practices are no exception. In this era of competition for best academic employees Ghanaian higher education institutions should, as a matter of urgency, decolonise their human resource practices. This paper advocates for human resource practices that are based on African values of humanness, compassion, love, respect and cooperation i.e. putting people first. The paper concludes that in order to train, nurture and retain the best academic employees human resources practices in public higher education institutions in Ghana should be people-centered. That is, they should base their human resources practices on African values of humanness, compassion, love, cooperation, and respect for their academic employees – that put people first if they are retain the best academics.

Recommendations

Based on the findings of the study the following recommendations were made for higher education institutions in Ghana:

- A joint committee made up of representatives of academic and human resources employees should be set up in all higher educational institutions which will discuss pertinent issues of concern for the employer to provide amicable solutions which may ameliorate negative impact on the institution.
- Human resources departments in higher education institutions in Ghana should adopt African values of *humanness* as basis of their practice in order to make employees feel part of the institution they work for.

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FACTORS CONTRIBUTING TO INSTITUTIONALISATION OF THE AGED IN OLD PEOPLE'S HOMES IN ZAMBIA: PERSPECTIVES OF THE AGED

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Abstract
The study explored factors that contributed to institutionalisation of the aged in old people's homes in Zambia from the perspective of the aged. The study was guided by continuity theory. It was a survey using a mixed method approach in which both quantitative and qualitative data was collected. The study population included the aged in all 9 old people's homes in the country. A sample of 165 respondents aged 60 years and above residing in the homes was purposively selected. A researcher-administered questionnaire was used to collect data. The findings of the study established that factors that contributed to institutionalisation of the aged in old people's homes included lack of family members to take care of them, abandonment related to illnesses and old age, destitution, harassment arising from suspicion that they were practising witchcraft and disability. The paper recommended that the capacity of old people's homes should be enhanced and strengthened so that they provide adequate care to the aged who may not have families to take care of them; there was need to introduce adult education programmes in form of retirement education and financial literacy to teach people how to prudently use financial resources to avoid future destitution; and there was need for the government and other stakeholders to embark on community sensitisation and design programmes to educate people, especially the young, on the need to develop a more positive attitude towards the aged, treat them with respect and dignity and not harass or abandon them.

Keywords: Institutionalisation, the aged, old people's homes

Introduction
Old people's homes are institutions in which needy aged persons are cared for. In Zambia old people's homes are a post-Second World War phenomenon. In 1948 the British colonial government in the then Northern Rhodesia established the first home for the aged in the country, which was Mitanda in Ndola (Kamwengo, 2001). However, the home admitted only non-Africans; white pensioners who did not want to go back to Europe. The colonial government felt that Africans should be looked after by their families. Elderly Africans who could not work on account of age or disability were repatriated to their villages or homes of origin in the rural areas. After Zambia's independence, nonetheless, the homes were extended to Africans (Kamwengo, 2001; 2004). There were 9 old people's homes in Zambia at the time of this study.

Kamwengo (2001) explains that although institutional care of the aged was discouraged in Zambia, the government decided to retain the homes for the aged as it realised three issues: firstly that there would always be some people in institutions of care because of factors such as childlessness and cultural taboos associated with ageing; secondly, there would be some people who may not be able to trace their families or remember their villages mainly because of urbanisation or illness; and thirdly, that there would always be some people without

families to look after them. This implies that the phenomenon of old people's homes is part and parcel of the living arrangements for the aged in Zambia and is likely to remain a permanent feature.

Statement of the problem

Although old people's homes, as a form of institutional care, had existed in Zambia since the post-Second World War, there was no known study undertaken to establish factors that had contributed to the institutionalisation of the aged in old people's homes from the perspective of the aged, hence the relevance and significance of this study.

Purpose of the study

The purpose of the study was to establish factors that led to institutionalisation of the aged in old people's homes in Zambia.

Literature Review

Literature that was reviewed in this study covered the following aspects: who an aged person is, population ageing, implications of population ageing, institutional care and the concept of old people's homes, advantages and disadvantages of institutional care for the aged and factors contributing to institutionalisation of the aged.

Who is an aged person?

Defining an aged person is seemingly not easy because society defines the concept differently depending on the context. For example, Kamwengo (2001) defines an aged person as one who is 65 years and older while the Zambian National Policy on Ageing (2013) defines an aged person as a male or female who is 60 years or older. Hurlock (1980) explains that age 60 is usually considered the dividing line between middle and old age, although it is also recognised that chronological age is a poor criterion to use in marking off the beginning of old age. This is because there are such marked differences among individuals in the age at which ageing begins. Hurlock further explains that because of better living conditions and better health care, most men and women do not show the mental and physical signs of ageing until the mid-sixties or even early-seventies. He further explains that for that reason, there is a gradual trend towards using 65, the age of retirement in many businesses, to mark the beginning of old age.

Literature, for example, Kamwengo (2001), Zambian National Policy on Ageing (2013) and Hurlock (1980) indicates there is no universal definition of an aged person as the concept is both socially and contextually oriented. However, this study adopted the United Nation's definition of an aged person, which stipulates that persons aged 60 years or over are considered elderly. This is also in line with the Zambian National Policy on Ageing. Further, in this study the terms aged, aged persons, older persons, elderly persons, older people and senior citizens were taken to mean the same and, therefore, used interchangeably.

Population ageing

Population ageing is the process whereby older people, as individuals, account for a proportionally larger share of the total population (World Population Ageing, 2007). According to Age and Security (2008), globally the population is ageing and the number and proportion of older people is increasing. The world is experiencing a rapid demographic transition, as people have fewer children and live longer. Populations are ageing in all countries, including the developing world. It has been projected that by 2050, less developed regions will have a population age structure similar to today's developed world, with almost

equal proportions of over 60 and under 15. Already, two-thirds of the world's older people live in developing countries. By 2050, this will increase by 80 per cent.

Age and Security (2008) further states that the number of people aged over 60 in the developed world was predicted to rise from 375 million in 2000 to 1,500 million in 2050. Even in developing countries with relatively young populations, the proportion of older people will rise significantly as a result of declining fertility rates and rising life expectancy. In sub-Saharan Africa too, the number of people aged 60 and over will more than double in the next 30 years despite the impact of HIV/AIDS on life expectancy at birth. By 2050, nearly one in four people in Asia and Latin America and one in ten in sub-Saharan Africa will be over 60.

Mapoma (2013) points out that, like other developing regions, Zambia is also currently experiencing population ageing. He explains that projections in his study have shown that the growth rate of people aged 60 and above was ranging between 2.5 and 3.3 per cent per annum for the period 2000 to 2015. He adds that from 2020 to 2050, the population of older people will grow between 2.5 and 5 per cent per annum, respectively. Mapoma states that by 2050, there will be approximately 38 million people in Zambia and that about 8 per cent or 3,040,000 of these will be aged 60 and above. He concludes that in general terms, although Zambia's population will remain predominantly young, the number of older people will continue growing.

Kamwengo (2004) asserts that people are ageing in a situation where the extended family, which is the main organ for social and economic organisation, is weakening because of the strains caused by urbanisation, industrialisation, mass education and deteriorating economies. However, this assertion is contradicted by Mapoma's (2013) findings which established that failure to care for the elderly in Zambia was not necessarily due to the weakening of the extended family system but economic factors. Mapoma explains that families were failing to look after or support older people due to their constrained socio-economic status and not necessarily that they were unwilling to do so.

Implications of population ageing

Growth in the numbers and proportions of older persons can be expected to have far reaching economic, social and political implications. In many countries the number of older persons is growing faster than the number of people in the traditional working ages. This has led to many governments considering increasing the statutory ages at retirement in an effort to prolong the labour force participation of older persons and improve the financial sustainability of pension systems. At the same time, population ageing and growth in the number of persons at very advanced ages, in particular, puts pressure on health systems, increasing the demand for care, services and technologies to prevent and treat non-communicable diseases and chronic conditions associated with old age (World Population Ageing, 2015. Namakando (2004) asserts that the implication of the projected population growth among the aged is that Zambia will have to contend with the burden of chronic diseases and disabilities, which predispose the older people to depend on others for activities of daily living.

Institutional care and the concept of old people's homes

Traditionally, care of the aged in all societies around the world has been the responsibility of family members and within the extended family home. Increasingly in modern society, however, care of the elderly is now also being provided by the state and/or charitable

institutions. The reasons for this change include decreasing family size, the greater life expectancy of elderly people, the geographical dispersion of the family and the tendency of women to be educated and work outside the home. Although these affected European and North American countries first, they are now increasingly affecting Asian and African countries also (Hendricks & Hendricks, 1981). This has implications on living arrangements and provision of care and services for the ageing population in that more and more resources will need to be allocated towards the general welfare of the aged.

Institutional care is when individuals spend a bulk of their sleeping and walking time in a setting which is not their home (Higgins, 1989 cited in Oldman & Quilgars, 1999). The literature reviewed shows that the concept of institutional care for the aged has various connotations and forms, depending on the specific purpose they are serving. Mentioned in the literature as forms and models of institutional care for the aged, include old-age homes, nursing homes, care homes, residential homes and senior homes. In the Nertherlands, for example, two broad categories of long-term care facilities for the elderly are distinguished, and these are nursing homes and old age homes. Elderly people who live in the first category of care facilities are physically and/or mentally ill and need special medical and nursing care. Older persons living in the second category of facilities do not need this special type of care, but only help with activities of daily living (Steverink, 2001). In Zambia institutional care for the aged entails the care provided to elderly persons in old people's homes or homes for the aged and, not necessarily nursing homes as is clarified by Kamwengo (2001:83) who states:

> Institutional care for the elderly in Zambia is limited to the services provided by homes for the aged. In the past, institutional care included services provided by the nursing home. But since the only nursing home in Lusaka and the geriatric centre in Ndola stopped functioning, the only serving institutions for the elderly have been the homes for the aged.

In a study on the quality of life of the elderly living in institutions and homes in Zimbabwe, Nyanguru (1990) asserts that as a result of a declining rural economy and the lack of an adequate social security system in urban Zimbabwe, many of the nation's elders faced severe economic hardships. He explains that they were without resources to pay rent or buy food, clothing and other necessities. Many elderly people reported that they had no one to look after them and that they slept in the open. Those who were lucky had to be placed in institutions for the aged. In the same study, Nyanguru reports that there was an increasing lack of accommodation and rising levels of incapacity and loneliness among the elderly. He further reports that there was a growing consensus among service professionals and community leaders as well as the elderly themselves, about the need for an institutional care system.

Advantages and disadvantages of old people's homes

Literature on institutional care for the aged reveal that there are both advantages and disadvantages of old people homes *vis-à-vis* the provision of care and services to elderly people. Hurlock (1980) points out that while many elderly people may rebel against giving up their own homes and going into an institution, there are certain advantages to this type of living. He goes on to outline the disadvantages of this kind of living arrangement. His summary of conclusions is provided in Table 1 below:

Table 1: Advantages and disadvantages of institutional care for the aged

Advantages	Disadvantages
• Maintenance and repairs are provided by the institution. • All meals are available at reasonable costs. • Provision is made for suitable recreation and amusement. • Opportunities are available for contact with contemporaries with similar interests and abilities. • There is greater chance for acceptance by contemporaries than with young people. • There is elimination of loneliness because people are always available for companionship. • It provides opportunities for contacts with contemporaries which the aged usually do not have if they live in their own homes or in the homes of grown children. • Holiday celebrations for those with no families are provided. • There is opportunity for prestige based on past accomplishments that would not occur in groups of younger people.	• It is more expensive than living in one's own home. • Like all institutional food, it is less appealing than home-cooked food. • There is close and constant contact with some people who may be uncongenial. • The choice of food is limited and often repetitive. • The location is often some distance away from shops, amusements and community organisations. • The location is usually at some distance from family and friends.

Source: Hurlock (1980:438)

Hurlock (1980) further points out that the aged who live in old people's homes, have recreation provided for them that are suited to their physical and mental abilities. He adds that those who live in their own homes or with a married child have fewer opportunities for recreation, especially if their economic status is poor or if failing health or transportation problems prevent them from participating in community-sponsored recreational activities.

Factors contributing to institutionalisation of the aged

The literature has revealed that the aged move to institutional homes due to a number of factors. Five Steps to Entry into Residential Aged Care (2011) highlights that while older people living in care homes in the United Kingdom had different reasons for entering care, they did have one particular characteristic in common, which was the inability to perform certain activities of daily living. It explains that people entering care homes generally did so because they were no longer able to live independently.

Hendricks & Hendricks (1981), on the other hand, state that quite often older people living out their years in some kind of institution were those who had no other recourse. They explain that these were the socially disadvantaged who had previously lived alone and were without close family ties, although serious health problems may also lead to the admittance of other residents. They further explain that entry to a home normally followed increasing mental or physical incapacity. Böckerman, Johansson & Saarni (2011) postulate that determinants of institutionalisation of the aged in Finland were very much in line with the existing body of knowledge; namely that older, poorer, single and less healthy individuals were more likely to be institutionalised.

Lam, Chi, Piterman & Lauder (1996) point out that there were three major social factors that influenced the decision making process towards admission to institutional homes in Hong Kong. These were absence of help, request for placement by the elderly themselves and the emigration of close relatives. Lalan (2014) also sought to establish reasons why the aged had moved into old people's homes in India. He proceeded to interview 40 elderly persons living in one of the homes in New Delhi. He established that most (40%) of the respondents had moved into the home because of strained relationships with their sons, while 30% had nobody to look after them. Twenty five per cent had no sons and, therefore, in order to avoid living with their married daughters, they move to an old people's home. The least (5%) wanted to have an independent and peaceful life.

Bergeron (2001, cited in Dubey, Bhasin, Gupat & Sharma, 2011) states that in India the role of families in taking care of older persons had declined due to structural changes which had taken place in Indian society and the concomitant disintegration of the joint family system which had resulted in the rejection or neglect of the aged. He explains that people went to institutions mainly because they had no relatives to care for them.

Zhan, Feng & Luo (2008) established in their study, that the second most frequent reason for institutional placement of elderly persons in China was their level of disability. They explain that some elders needed around-the-clock care after a major stroke or illness while others needed regular or constant medical attention that the family members were unable to provide.

Perold & Muller (2000) indicate that in South Africa old age homes came into existence because of various social problems including loneliness, economic and housing problems, deteriorating mobility of the older persons and lack of family and other support systems for them in the community. Kamwengo (2002) adds that in South Africa admission to the homes for the aged was based on age, inability to look after oneself, being disabled or lacking accommodation.

Furthermore, Nyanguru (1991) states that the reasons for admission into homes for the aged in Zimbabwe were varied but that the major issue for European was security. He points out that most (49 %) of the elderly had found it unsafe to live alone as they had been targets of break-ins and robberies in their houses and some had even been murdered. Some elderly people reported that they had built security fences around their homes, but this did not give them the security they needed. They, therefore, moved to old people's homes where they believed they would be secure. Oluwabamide & Eghafona (2012) established that in some rural communities in Africa, older people were often accused of practising witchcraft. They point out that younger members of such communities often called older people witches and wizards that and this was one of the factors that made them (older people) withdraw from other members of the community.

The literature reviewed has indicated that there are various factors that contribute to institutionalisation of the aged in different countries and contexts. It has, however, also established that there are few studies on institutional care of the aged in Africa in general and Zambia in particular, possibly because the practice is not so widespread. This study, therefore, sought to provide some insights into factors that contributed to institutionalisation of the aged in the Zambian context from the perspective of the aged themselves.

Theoretical Framework

The study is grounded in continuity theory. This is a theory of adult development which proposes that in making adaptive choices middle-aged and older adults attempt to preserve and maintain existing psychological and social patterns by applying familiar knowledge, skills and strategies (Kelly, 1993). The theory suggests that maturing persons will develop certain habits, preferences and commitments that become part of their personalities. Therefore, when an individual grows older, there will be continuity of that personality. This means that the individual self or personality remains consistent despite life changes. Continuity theory emphasises that the foundation of earlier life experiences such as skills, personality traits and dispositions, creates a repertoire of coping strategies that older individuals can call on to adapt to age-related changing circumstances (Blackburn & Dulmus, 2007).

The basic premise of continuity theory is that each individual develops a personality over the course of a lifetime that is a stable feature of their individuality, which affects how they react to events. This implies that individuals attempt to maintain personality continuity as they age (John, 1984). Continuity theory explains how people adapt to their own ageing. It posits that the elderly try to preserve and maintain internal and external structures by using strategies that maintain in this way the continuity. In later life, adults tend to use continuity as an adaptive strategy to deal with changes that occur during normal ageing (Drăghia, 2009).

Continuity theory is relevant to this study in the sense that it is reminding us that although the aged in institutional care moved from their previous dwellings, which were significantly different from their new situations, their basic personalities, values, interests and related aspects remained fairly consistent. For example, from the religious perspective, the aged may maintain their church affiliation and denominations they belonged to before moving to old people's homes and may still want to identify with these denominations. Similarly, those with specific skills and are still energetic, may wish to continue practicing them and even pass on to others, given the opportunity and means to do so. The implication is that caregivers and other stakeholders should be able to identify skills and interests that the aged may already possess and create an environment in which they would put them to use in order to live more productive lives.

Methodology

The study was undertaken in all 9 old people's homes in Zambia as a survey using a mixed method approach. The sample comprised 165 respondents aged 60 years and above residing in the homes. The respondents were purposefully selected based on their ability and willingness to participate in the study. A researcher-administered semi-structured questionnaire was used to collect data due to low literacy levels among most of the respondents. The questionnaire contained open-ended questions, which generated qualitative data and close-ended questions, which generated quantitative data. Qualitative data was

coded and thematically arranged and presented in narration form while quantitative data was analysed, calculated and presented in frequency and percentage tables.

Study findings

The study findings are presented under the following sub-themes emerging from the data analysis: background characteristics of the respondents and factors that contributed to institutionalisation of the aged in old people's homes in Zambia.

Background characteristics of the respondents

A total of 165 aged respondents residing in old people's homes in Zambia participated in the study. Table 2 below shows the distribution of the respondents by province, old people's homes and gender:

Table 2: Distribution of respondents by province, old people's homes and gender

Province	Old People's Home	Gender		
		Male	Female	Total
Copperbelt	Chibolya	10	11	21
	Chibote	8	5	13
	Mitanda	9	9	18
	St. Therese's Village	9	9	18
Lusaka	Divine Providence	9	8	17
North-Western	Nkulumazhiba	2	8	10
Southern	Maramba	27	15	42
Western	Kandiana	9	3	12
	Likulwe	6	8	14
Total		**89**	**76**	**165**

The Copperbelt province had the majority (70) of the respondents. The Southern province was second with 42, followed by the Western province with 26 and then Lusaka with 17. North-Western province had the least (10) respondents. It should be noted that the Copperbelt province had 4 old people's homes while the Western province had two. The rest had one each. Furthermore, 89 of the residents in old people's homes were males, while 76 were females, meaning that there were more males than females residing in the homes.

Age of respondents

Table 3 below shows the age distribution of the respondents:

Table 3: Age of respondents

Age Range		Frequency	Percent
	71 years and above	102	61.8
Valid	60-70 years	34	20.6
	Total	136	82.4
Missing	Not stated	29	17.6
Total		**165**	**100.0**

One hundred and two (61.8%) of the respondents were aged 71 years and above, while 34 (20.6%) were aged between 60 and 70 years. The average age of the respondents was 77.24 years with the oldest being 99 years and the youngest being 60 years old.

Nationality of respondents

Establishing the nationality of the respondents (aged) residing in old people's homes was considered a necessary part of background information and as it gave an idea of the origin of the residents. Table 4 below shows the nationality of the respondents:

Table 4: Nationality of respondents

	Frequency	Per cent
Zambian	150	90.9
Angolan	6	3.6
Malawian	2	1.2
South African	2	1.2
Zimbabwean	2	1.2
Congolese (DRC)	1	0.6
Mozambican	1	0.6
Polish	1	0.6
Total	**165**	**100.0**

As is shown in Table 4 above, old people's homes did not only accommodate Zambian nationals but also those from other countries within Africa and beyond. However, the majority 150 (90.9%) of respondents were Zambians.

Factors contributing to institutionalisation of the aged in old people's homes in Zambia

This section presents the findings on factors that contributed to institutionalisation of the aged in old people's homes in Zambia from the perspective of the aged living in these homes. Table 4 below shows the factors:

Table 5: Factors contributing to institutionalisation of the aged in old people's homes

Factors	Frequency n = 165	Per cent
Lack of family members	70	42.4
Abandonment related to illness and old age	35	21.2
Destitution	32	19.4
Harassment	16	9.7
Disability	12	7.3

Table 5 above indicates that lack of family members was the major factor that contributed to institutionalisation of the aged in old people's homes in Zambia as 70 (42.4%) of the respondents indicated that they had no one to take care of them. Thirty five (21.2%) indicated that they were abandoned by their families on account of illness and old age, while 32

(19.4%) attributed their moving to old people's homes to destitution. Sixteen (9.7) of the respondents stated that they had suffered harassment on suspicion that they practised witchcraft. Twelve (7.3%) mentioned disability as a factor that led to their institutionalisation. The factors are described and illustrated below:

Lack of family members

Lack of family members was the first factor that contributed to institutionalisation of the aged in Zambia. The respondents stated that they had no one to take care of them because they had lost all family members or could not trace them and, therefore, the only option was for them to move to old people's homes. For example, a female respondent at Chibolya old people's home said:

I lost my husband and all my five children. So I had no one to take care of me. That is how I approached my pastor and explained my situation to him as I was having difficulties. The pastor then brought me here and this is now home.

A male respondent at Maramba old people's home also put it as follows:

I lost touch with my people in the village when I moved to town to work a very long time ago. I stopped writing letters to them when I started working on the farms. So I had nowhere to go after retirement as I could not trace any one of them.

Abandonment related to illness and old age

The second factor that contributed to institutionalisation of the aged was abandonment related to illness and old age. The respondents indicated that they had been ill and hospitalised for a long time and that family members who had been visiting and supporting them eventually stopped doing so and abandoned them. One male respondent on a wheel chair at Chibolya old people's home explained:

I was admitted to Liteta Leprosarium in 1963, a year before we got independence. I was discharged from there in 1980 after a doctor from the UK certified that I was completely cured of leprosy and could not transmit it to others. However, after noticing that no one had been coming to visit me, they sent me to Social Welfare in Lusaka, who sent me to Matero Aftercare, a transit home. In 2000, I was sent to Chibolya home, where I have been ever since.

A female respondent at Divine Providence home also said:

I was very ill and hospitalised in the university teaching hospital for four years and when I was discharged I had nowhere to go. I could not trace any of my relatives as they all had abandoned me. When I was in hospital no one ever visited me. So Sister brought me to Divine Providence on the recommendation of the Minister of Community Development Madam Catherine Namugala. Both my legs were amputated at the hospital.

Destitution

The respondents indicated that they had no means of livelihood and survival, resulting in their moving to old people's homes. A male respondent at Divine Providence home made the following statement:

I had nowhere to go after losing my employment. I, therefore, became a destitute. I had no money and no house. I started loitering until one priest who had earlier known me heard of my situation. He then brought me to this place.

Additionally, a female respondent who was living at Divine Providence home with her husband said:

I came to this home with my husband. We had nowhere to go after he stopped work in Mazabuka. We got stranded as he could not find another job. So we were brought here by Social Welfare. We thank God that the Sisters allowed us to live here.

Harassment

Harassment of the aged by communities in which they lived was the fourth factor that contributed to institutionalisation of the aged. The respondents reported that they had suffered harassment and abuse in their communities after being accused of practising witchcraft. For example, a female respondent at Nkulumazhiba old people's home lamented:

...they tied my legs, put me in a sack and were about to throw me into the Kabompo river after accusing me of practicing witchcraft. This followed the death of one of my grandchildren. Some good Samaritans rescued me and that is how I ran to this home. I will never return to the village. I am very happy here.

Another female respondent at Maramba old people's home explained that she had been accused of practising witchcraft and chased from her village. She started sleeping in the bush with no one to assist her. She then decided to approach some church members who took her to Maramba. She said, "I was a very sad person with a lot of body pains, but the government has really helped me. I am very grateful."

Disability

This fifth factor that contributed to institutionalisation of the age was disability. The respondents indicated that they found themselves in old people's homes because they were unable to take care of themselves due to disability. One female respondent at Likulwe old people's home explained:

I was incapacitated after suffering from leprosy for a long time and could not engage in productive activities or take care of myself. So I was brought me here where I have been living all along.

Additionally, a wheel chaired male respondent at Mitanda old people's home said:

I came to this home because of disability. I used to work as a truck driver but was involved in a road traffic accident and lost both my legs. I was treated at Mansa General Hospital but the condition did not improve. I was then transferred to Ndola Central Hospital where I was admitted for one year. After being discharged I went back to Mansa, but life became difficult as I could not look after myself. So the Social Welfare brought me to Mitanda, whose existence I was already aware of as I used to pass near here as a driver.

Discussion of Findings

This study sought to establish factors that contributed to the institutionalisation of the aged in old people's homes in Zambia. The findings indicated that lack of family members to take care of the aged was the first major factor that contributed to their institutionalisation. This finding is in consistent with Nyangulu (1990) who asserts that many elderly people in Zimbabwe had reported that they had no one to look after them and that they slept in the open and those who were lucky had to be placed in institutions for the aged. This is, however, in

contrast to Five Steps to Entry into Residential Aged Care (2011) which postulates that the major reason for institutionalisation of older persons in the United Kingdom was inability to perform certain activities of daily living.

The second factor that contributed to institutionalisation of the aged in old people's homes was abandonment related to illness and old age. The study established that some aged persons were abandoned by their families on account of being ill and hospitalised for a long time. Findings from this study agree with Mapoma's (2012) who posits that family abandonment is very common in Zambia and is seen both as a cause and effect of the challenges facing older persons.

The third factor that contributed to institutionalisation of the aged in Zambia was destitution. The respondents pointed that they had lacked even the most basic necessities of life and subsistence, which rendered them helpless and vulnerable. The only option they had was institutional care. The finding on destitution is consisted with Nyanguru's (1991) study which established that the majority of African and Coloured elderly persons in Zimbabwe had entered old people's homes because of destitution. He, however, also clarified that the European elderly did not move to the homes because of this factor but other considerations such as safety.

Furthermore, Nyangulu (1990) points out that as a result of a declining rural economy in Zimbabwe, many of the nation's elders faced severe economic hardships and that they were without resources to pay rent or buy food, clothing and other necessities. The National Policy on Ageing (2013) states that the social and economic conditions, including changing values and urbanisation have resulted in families being unable to care for their vulnerable members. It further states that the influence of Western culture, which has emphasised the nuclear family, has to a large extent, contributed to the weakening of the extended family system in Zambia and this has left those vulnerable older persons in a state of destitution. It, therefore, advocates promotion of institutional care for senior citizens who cannot be supported by their extended families**.**

The fourth factor which was cited as having contributed to institutionalisation of the aged in Zambia was harassment. The aged reported being harassed and abused in communities they lived following accusations that they had been practising witchcraft. This is consistent with Mapoma (2012) who explains that abandoning older relatives is a practice that has, to a large extent, been influenced by the community especially in instances of tramped up accusations that they are practising witchcraft.

The fifth factor that contributed to institutionalisation of the aged in Zambia was disability. Some elderly persons reported having been incapacitated by illnesses, such as polio and leprosy and accidents and could, therefore, not take care of themselves and neither were their relatives prepared to look after them. This finding is in agreement with Zhan, Feng & Luo (2008) who established in their study that the second most frequent reason for institutional placement of elderly persons in China was disability.

Conclusion

The study concluded that factors which contributed to institutionalisation of aged in old people's homes namely, lack of family members, illness, destitution, harassment, abandonment by family members and disability as well as projections on population ageing

were indicators that institutionalisation of the aged in Zambia was likely to continue. The study also concluded that institutionalisation would remain one of the living arrangements for the aged in the country, owing to the enduring nature of the factors contributing to this phenomenon. This implies that residents of old people's homes ought to be provided with necessities of life and services such as food, clothing, medical care, leisure, spiritual support, counselling and education to enable them live more meaningfully and productively in line with continuity theory.

Recommendations

Arising from the findings the study recommended that the capacity of old people's homes should be enhanced and strengthened so that they provide adequate care to the aged who may not have families to take care of them. It also recommended that there was need to introduce adult education programmes in form of retirement education and financial literacy to teach people how to prudently use financial resources to avoid future destitution. The study further recommended that there was need for the government and other stakeholders to embark on community sensitisation and design programmes to educate people, especially the young, on the need to develop a more positive attitude towards the aged, treat them with respect and dignity and not harass or abandon them.

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TVET LECTURERS TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK) IN SOUTH AFRICAN TVET INSTITUTIONS: A CASE STUDY IN AUTOMOTIVE REPAIR AND MAINTENANCE TEACHING

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Abstract

Technology provides the means through which technical vocational education can improve the TVET sector in Gauteng – South Africa. The success of technology integration in VET depends largely upon TVET lecturers: professional knowledge, pedagogical and technological knowledge and the relationship between their beliefs about these constructs. In this paper qualitative data was used to examine how TVET lecturers knowledge and beliefs influenced their technology integration practices in the teaching of Automotive Repair and Maintenance. Interviews were used to collect data from twelve TVET lecturers teaching Automotive Repair and Maintenance in four TVET colleges in Gauteng. The study found that specific characteristics or behaviors related to each of the technology integration components of TK, TCK, and TPK that impacts on successful planning and implementation of TVET lecturers' technology-enhanced lessons.

Keywords: Technological; pedagogical; content; technical; vocational education

Introduction

According to (National Centre for Vocational Education Research, 2013) Vocational Education and Training (VET) can be defined as post-compulsory education and training, excluding degree and higher-level programs, delivered by further education institutions that provide people with occupational or work-related knowledge and skills (p. 119). Technical Vocational Education and Training (TVET) is an integral component of the South African education system. It is one of the three major sectors of education and training in South Africa designed to meet the skills shortages in South Africa. Technical vocational education that is offered at TVET colleges plays a pivotal role in the attempt to meet the skill shortages and drive the economy of the country. It is important to ensure that vocational education programs provide real world skills required by the private and public sectors. The curriculum of Technical and Vocational Education Training (TVET) is based on a vocation e.g. Automotive Technician and this play an important role in producing skilled and semi-skilled manpower for the country.

According to (Taylor 2011) the current TVET lecturers' cadre in South Africa are ill prepared to deliver the new curriculum hence the poor results in the TVET sector. Many TVET lecturers enter the sector with rich content knowledge of a particular trade or vocation and it is assumed that they bring with them knowledge of the tools and the technology of that industry was from the workplace. With regard to lecturing compenticies it cannot be assumed that lecturers have developed sufficient pedagogical knowledge to inform their teaching practices, let alone the technological knowledge required to integrate technology with their

pedagogy (Wheelahan and Moodie, 2010) Therefore, this paper aimed to explore the vocational pedagogy and instructional issues by investigating the integration of technological, pedagogical and content, which is currently receiving great emphasis in the educational world.

Problem Statement

Technical vocational education (TVET) that is offered in TVET Colleges plays a crucial role in the endeavor to meet the skill shortages and drive for the economy of South Africa. Since TVET studies reside in TVET colleges its effectiveness and its quality should be given priority to ensure the production of human capital. Previous research related to training effectiveness and its quality did not emphasize on the pedagogic and didactic processes such as teaching and learning. Poor student results in the sector can be attributed to the lecturers' capacity to deliver the theoretical and practical components of the national (NCV) curriculum to students. Due to the poor training of TVET lecturers from previous education system (Taylor, 2011), there is great need for TVET lecturers to be competent in both content and pedagogic aspects of their teaching and learning process . This paper is based on the hunch that the current TVET lecturers lack technological and pedagogical content knowledge in their teaching practices. This hypothesis is supported by the ministry of education when mandating higher education institutions to work with TVET colleges to empower TVET lecturers in pedagogic aspects. Hence this paper sought to explore the vocational pedagogy and instructional issues by investigating the integration of technological, pedagogical and content knowledge, which is currently receiving great emphasis in the educational world.

Purpose and objectives of the paper

The purpose of this study was to investigate the teaching practices and understandings of lecturers' technological pedagogical and content knowledge (TPACK) in Automotive repair and maintenance subjects/course at TVET colleges in Gauteng. In light of the above research the objectives of the study were identified as follows: RQ 1 What are the TVET college lecturers' practices of technological pedagogical and content knowledge in the teaching and learning of Automotive repair and maintenance? RQ 2 How do TVET lecturers apply TPACK to enhance their teaching of Automotive repair and maintenance?

Literature review

TPACK constructs and their application in the TVET sector

Pedagogical knowledge refers to teachers' knowledge about the processes of teaching and learning (with or without technology) and how it is realized to achieve educational purposes, values, and aims. A teacher with 'deep pedagogical knowledge understands how students construct knowledge, acquire skills and develop habits of the mind and positive dispositions toward learning' (Mishra and Koehler, 2006). The need to strengthen TVET pedagogical practices has emerged for several key reasons. As the TVET sector is called upon to deliver more ambitious government objectives, the need for more complex pedagogies to address the needs of diverse students from various backgrounds is paramount (Guthrie et al..,2006; Wheelahan, 2010). The vocational sector's close association with the workplace makes it more complex than academic teaching in that it involves working with multiple clients, in

multiple contexts and across multiple learning sites. The TVET lecturer's role has therefore extended to developing industry partnerships and working collaboratively with specialist service providers.

Lecturers in the TVET sector are recruited based on their content knowledge, which is being taught in colleges. It is assumed that lecturers begin their teaching career with rich content knowledge of a particular trade or vocation bringing with them knowledge of the tools and the technology of that industry. Their content knowledge is often highly specialized technical vocational knowledge. Changes to the industry over time, signal the importance for TVET lecturers to regularly update their content knowledge (Toner, 2005; Wheelahan and Moodie, 2010). Many lecturers may not have this required knowledge if they have been removed from that industry for many years (Cornford, 1999). Therefore, there is a pressing need for TVET lecturers to develop industry currency and apply this updated knowledge to their teaching (Corbel, 2013).

Lecturers' content knowledge (for industry) and lecturers' content knowledge (for teaching) presents certain pedagogical challenges specific to the TVET lecturer. It requires the TVET lecturer to re-contextualize their implicit content knowledge into explicit knowledge forms so that it can be taught (Robertson, 2010). According to Salter and Bound (2009), research on content knowledge in the TVET sector is limited. While the TPACK model acknowledges the importance of content knowledge, the heavy involvement of industry in the TVET sector may generate considerable epistemological debate as to who determines the content that is to be taught. As most technologies are not developed for teaching or educational purposes, the teacher's role is to repurpose them for educational purposes (Koehler et el…2014). In the TVET sector, the definition of technology needs to be expanded to include specific technology, which refers to equipment, and machines, which are used to perform certain tasks in the workplace (Guthrie et al., 2009).

Lecturers need the pedagogical knowledge to teach the content. A recent report into the quality of teaching in TVET recommended the commissioning of research into the development of pedagogical content knowledge in different fields or disciplines to develop a distinct TVET pedagogy (Wheelahan and Moodie, 2010). Both Wheelahan (2010) and Robertson (2010) address the need for teachers to have strong pedagogical content knowledge. The calls have come from a renewed focus on the quality of TVET lecturers. Even South Africa according to (Taylor 2011) the current TVET lecturer cadre is ill prepared. He furthermore, he added that until recently in South Africa 'there was no training base for TVET college lecturers' and there has never been a concerted effort to develop a new pipeline of lecturers. So far, recruitment has been ad hoc, and colleges are often forced to appoint lecturers from the ranks of their own graduates because no other trained personnel are available. In an informal qualification audit undertaken by DHET, it became evident that current lecturers have an array of qualifications, ranging from those with formal teaching qualifications or degrees to those with trade qualifications/trade theory qualifications or industry credentials, but no teaching expertise, and vice versa (SADTU, 2011).

TVET lecturer's beliefs about technology and pedagogy

The TPACK framework supports teachers to move beyond their traditional, pedagogical and epistemological practices towards more constructivist uses of technology in teaching (Chai et

al., 2013). Examining lecturers' core beliefs about teaching, learning and knowing about technology may be just as important as they tend to shape their teaching knowledge and practices (Bates and Maor, 2010). A gap in the research reveals those lecturers' beliefs, in general, have received less attention than beliefs associated with technology. Fundamental beliefs about teaching and learning may shed more light on teachers' technology integration practices than beliefs about the technology itself (Kim et al., 2013).

Teachers' beliefs about technology have been reported as having a critical influence on their practices with technology (Inan and Lowther, 2008; Palak and Walls, 2009; van Braak, Tondeur and Valcke, 2004), in particular, their attitudes towards technology (Kotrlik and Redmann, 2009). Even Zhao and Frank (2003) suggest, "unless a teacher holds a positive attitude towards technology, it is not likely that he or she will use it in teaching".

Methodology

A qualitative case study approach within an interpretive paradigm was used to guide this research project to explore in-depth FET/TVET lecturers' TPACK in Engineering and Related Design (ER&D). Opie (2004) and Merriam (2009) assert that a qualitative case study is an exhaustive study of a certain phenomenon, where a phenomenon is studied in detail to provide more thorough explanations of the processes and relationships related to that phenomenon. A case study approach also has disadvantages. The case study approach does not allow for generalisations because it focuses on a particular situation, therefore the results of a case study cannot be generalised to other situations (Descombe, 2007). However Descombe argues that the results of a case study can also be applied to situations having similar characteristics as the one under study, in this case, Automotive repair and maintenance teaching in FET colleges.

A case study helps researchers to explore a certain phenomenon in its context using different data collection methods (Baxter, 2008). The researcher chose a case study approach because it is most suitable to help him explore the understandings of FET college lecturers' practices of TPACK, specifically in South African FET/TVET colleges. This study focuses on a single case study in order to study the practice of vocational pedagogy in technical vocational education. A case study therefore provides the best scope for answering the researcher's questions. Golofshani, (2003) argues that a case study allows multiple data collection methods and these methods enable validity through triangulation (Descombe, 2007). The researcher therefore decided to use the case study approach in this study to ensure validity.

Face- to -face interviews was conducted so as to produce data about the teaching practices processes related to curriculum delivery. This represented a conversation with purpose, which was organized by asking and answering questions. Interviews were one of the main data collection techniques the researcher used in this study. It was also established that it would assist towards a better understanding of the lecturers TPACK and their competencies. These interview sessions , was recorded, in order to be replayed to establish a pattern that will explore the beliefs and experiences of the lecturers regarding their use of technology in teaching.

Population and sampling

For the purpose of this study the researcher used the purposive sampling method to identify twelve TVET lecturers from four TVET colleges who were Engineering and Related Design (ER&D) specialists teaching Automotive repair and maintenance. Purposeful sampling was used in this study because it ensured selection of samples that were information-rich with respect to the purpose of the study (Gall et el.., 1996; Cohen, Manion and Morrison, 2000). Three lecturers teaching Automotive repair and maintenance from each campus were observed while facilitating Automotive repair and maintenance and later interviewed. Lecturers who were sampled had taught the subject at the college for two or more years. These participants were familiar with the curriculum, and experienced in offering Automotive repair and maintenance.

Results and discussions

The researcher conducted face – to face interviews with the twelve TVET Gauteng lecturers. The interviews with lecturers were recorded and then transcribed, after which a sequence of repeated themes was extracted in relation to the TPACK theories presented in the literature review. Themes were derived from data obtained to answer RQ 1What are the TVET college lecturers' practices of technological pedagogical and content knowledge in the teaching and learning of Automotive repair and maintenance? RQ 2 How do TVET lecturers apply TPACK to enhance their teaching of Automotive repair and maintenance?

The researcher then analyzed the interviews for a second time with the purpose of verifying the themes found in the first analysis. The themes were then used for reporting the results. In reporting themes from the analysis, quotes were cross-referenced back to the researcher's original transcripts. The lecturers' responses to the interview questions were then mapped out according to the TPACK knowledge domains, and are reflected in Table 1.

TABLE 1: Lecturers interview responses related to TPACK domains

TPACK component	THEMES
Technological knowledge (TK)	Use of ICT tools for lecturing
Technological pedagogical knowledge (TPK)	Lecturer ICT integration competency affects teaching
Technological Content knowledge (TCK)	Smart Technologies enhance auto-motive repair and maintenance

The table above represents lecturer's interview responses that generated the different themes according to TPACK knowledge domains. From the general coding categories identified from the data of the twelve participants, TPACK characteristics were identified and arranged into the three technology structures of TPACK as identified by Koehler and Mishra (2008). When the lecturers were asked the following questions: what do you feel are the most important technological competencies for you to properly use technology in lecturing?; how can you evaluate your own competencies in ICT integration in automotive service and repair; do you know how to select effective teaching opportunities to guide student thinking and learning in automotive repair and maintenance; what do you know about technologies that can help you to present your content knowledge?; what type of technologies you use to enhance your teaching of automotive repair and maintenance. The FET lecturer's responses produced the following themes which are discussed below:

Theme 1 - Use of ICT tools for lecturing

ICT in lecturing has become a teaching tool in the 21st century. TVET lecturers in this study noted that they understood the TVET colleges' mandate to develop and promote teaching and learning using the integration of technology. Equally, they acknowledged some pressure to participate in a technological world as the way of the future, for both lecturers and students; particularly in Gauteng as illustrated by a lecturer (006) from TVET College 2 who said this "We must be able to use a computer". Consistent with lecturer's conceptions of technology integration from the lecturer's responses in this study it was reasoned that technology opened up the student's world by providing a rich source of knowledge and information. This was common with many lecturers whose responses were: use of video demonstration (003), use of overhead projectors (006), use power point + tutorial videos + OHP (005), this was in keeping with previous studies where vocational education and training teacher is called upon to deliver more ambitious government objectives, the need for more complex pedagogies to address the needs of diverse students from various backgrounds is paramount (Guthrie et el…,2006; Wheelahan, 2010). For some TVET lecturers, reasons for teaching with technology were for personal enjoyment I guess I enjoy technology "yes I think I do, I do, I definitely do" whilst lecturer (004) from TVET college 2 felt "we don't have much technology in our college, we still lack these in lecturing", in this study lecturers did indicate, limited exposure to the use of technology for teaching.

Theme 2 - Lecturer ICT integration competency affects teaching

Lecturer ICT integration competency is essential in TVET institutions; FET lecturers articulated their competency levels when asked "what do you feel are the most important technological competencies for you to properly use technology whilst you are lecturing? FET lecturer (003) from TVET College 1 replied: "well first of all you must be educated in computers, you must be able to set up power – points and if those things are not available, it is not that easy, if you haven't got the experience to make use of decent and proper transparencies". Still revealing their TK competency level lecturer (011) from institution 4 commented: "One must be able to use power-point. One should be able to operate video equipment and also, maybe an overhead projector and "Yes I have the necessary skills, I have been trained." (010) what do you feel are the most important technological competencies for you to properly use technology in lecturing?; how can you evaluate your own competencies in ICT integration in automotive service and repair; do you know how to select effective teaching opportunities to guide student thinking and learning in automotive repair and maintenance; what do you know about technologies that can help you to present your content

knowledge?; what type of technologies you use to enhance your teaching of automotive repair and maintenance. Most technologies are not yet developed for teaching or educational purposes, the teacher's role is to repurpose them for educational purposes (Koehler et el..,2014). In this study the findings for TVET teaching, the definition of technology needs to be expanded to include specific technology, which refers to equipment, and machines, which are used to perform certain tasks in the workplace (Guthrie et al.., 2009).

Theme 3 - Smart Technologies enhance automotive repair and maintenance

TVET lecturers are of the opinion that the integration and the matching of the correct technology for the teaching of auto-motive repair and maintenance enhance their lessons and these are regarded as smart technologies. Data projectors + computers, power point presentations including Wi-Fi environment, constitutes smart technologies for teaching and learning. To quote a lecturer's (012) from TVET college 4 commented: "Technologies add value to my teaching I have even introduced students to it because most of the times I bring my own modem and show them that they can get anything from the internet. I use that to download them then I introduce them, I say that if you are using technology they are very useful, they say that they are very strong education tool". Whilst lecturer 5 from TVET college 2 felt "With this technology competency, when you are talking about this it is so far important so to use technology to impart this knowledge to your students because sometimes if in automotive, like if we were dismantling which we call an engine or doing some practicals if the students are seeing that in the video and therefore the student tend to concentrate on that and do everything of….". Lecturer (001) from TVET college 1 acknowledged that his students were advanced with technology and they bring these to lectures "Knowing that my students are advanced with technology and they are on their cell phones on a regular basis, I try and use a lot of video and the data projector, if needs be sometimes they use their cell phones as well to do research." On the contrary lecturer (010) from TVET College 4 cited, "accessibility and flexibility and flexibility as reasons for using technology in the teaching automotive repair and maintenance." In this study it could be seen that smart technologies enhance automotive repair and maintenance there is not enough evidence relating to the way technology enhanced lessons. TVET lecturers in this study still use traditional technologies such as data projectors and power-point presentations and videos in TVET colleges without exploring technologies that are relevant to automotive repair and maintenance such as simulation ,training boards etc.

Recommendations

This paper was guided by a framework for understanding FET lecturers' knowledge in terms of their integration of TPACK (Mishra and Koehler, 2006). This framework\model was grounded in understanding that quality teaching does not occur unless the three bases of technology, pedagogy, and content knowledge co-exists in a particular context. The TPACK framework allows close examination of lecturers' existing structures of knowledge and the complex relationship between their technology, pedagogy and content knowledge. It does not however explicitly deal with the instruction of technical vocational education and training. In the instruction of Technical Vocational Education and Training (TVET) "the issue is no longer a decision whether lecturers should integrate technology into their existing practices but rather how to use technology to transform teaching and create new opportunities for learning" (Angeli and Valandides, 2009). Technological tools are 'not in themselves

transformation mechanisms, or vehicles for change'; rather, they are tools 'invoked by its users to reconstruct the subject matter from the knowledge of the teacher into the content of instruction' (p. 157). A model therefore should provide an analytical lens through which TVET college lecturers can conceptualize the relationships between technology, pedagogy and content matter thus improving their curriculum delivery and implementation of automotive repair and maintenance hence improving their NC(V), Engineering and Related results. Therefore it is imperative to propose a dedicated model for TVET this could be termed the TVETPACK model, which speaks to Technical Vocation Education and Training in general.

Conclusion

This study suggests that if TVETPACK is promoted as a model for teachers to think about combining pedagogy, content and technology knowledge, it would be practical to acknowledge their efforts to develop constructivist, student-centred practice. Most importantly, it could be valuable as a means for identifying training needs. Lecturers could use the model to identify and reflect on their beliefs and their teaching knowledge as well as their professional development needs (Anderson et al., 2013). The development of TVETPACK could also be aligned with other frameworks such as the recently released VET Capability Framework (IBSA, 2013) which provides a common language for the knowledge, skills, behaviours and attitudes that practitioners are supposed to display when they are performing well in their roles. TVETPACK focuses on the knowledge and the skills lecturers need to get to the point where they are perceived, or perceive themselves as performing well in their roles. TVETPACK highlights the potential to redesign professional development programmes, inform teacher education programmes and enrich teachers' and students' lives.

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EDUCATION IS POWER: ADULT AND COMMUNITY EDUCATION AND TRAINING AS AN EMPLOYMENT TOOL FOR WOMEN, IN LUSIKISIKI, EASTERN CAPE PROVINCE

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Abstract
Lusikisiki is a rural area in the Eastern Cape of South Africa. Most of the women in the area lack education and skills for employment. Education is the best tool for employment and without basic knowledge and skills, women in rural communities might be condemned to perpetual poverty. Again, they might not be able to participate in the socio-economic activities of their respective communities. This paper explored how basic education can be used as a tool for employment among rural women of Lusikisiki by equipping them with basic knowledge and skills for livelihoods. A qualitative research approach in the form of a case study design was used for the study where data were collected through semi-structured interviews. A sample of 25 participants was purposively selected for the study. The results indicated a lack of education among rural women due to some obsolete cultural practices and perceptions which result in unemployment. Based on the findings the paper recommends that unemployed rural women should be equipped with basic knowledge and skills to enhance their livelihoods.

Keywords: skills training, unemployment, poverty, livelihood, women.

INTRODUCTION AND BACKGROUND

Globally, education is used to transform the conditions of people to enable them to live better and productive lives. The current government of South Africa sees education as the best tool to equip its citizens with basic knowledge and skills for better livelihood. Apartheid gave black citizens inferior education and many were denied educational opportunity altogether. Rural women particularly were affected greatly hence, most of them are unemployed. For instance, Aitchison (2006) attests that 4.7 million adults (16% of the total population above the age of 15) are illiterates because they do not have any schooling. Aside this number of illiterate adults is a group of a further 9.6 million (32%) who did not complete primary school. This situation is a problem because women cannot access work without basic knowledge and skills and could be cut off from socio-economic activities. Education is the best tool for social and economic transformation and yet many black South Africans are denied education (Baatjes, 2008). This unemployment situation poses a threat to social cohesion unless rural women are liberated from the problem of illiteracy. Between the periods of 1995 to 2003, unemployment in South Africa grew by 47 per cent to 62.8 per cent (Kingdon & Knight, 2007; Banerjee et al., 2008). In 2008, unemployment grew to 33.4 per cent. Again, it grew from 33.4 per cent to 36.5 per cent in 2010 (Verick, 2012). Currently, unemployment rate still is around 25 per cent (Anand et al., 2016). The statistics above is done to the denial of basic education to black South Africans.

The Bantu education system which was established in 1953 aimed at giving the indigenous people inferior education as compared to their white counterparts. According to Dlamini (1990), Bantu Education was structured to provide cheap labour for white farmers and businesses. The blacks were taught to be "Hewers of wood and Drawers of water" (Dlamini, 1990, p. 72). This left the South African parents with two options: exposing their children to the inferior Bantu Education system or giving them no education at all. Troup (1976) reports that only one African child in every two of school-going age was actually attending school. Many parents were willing to take advantage of the little education that they could get from the inferior Bantu Education system (Troup, 1976). There might be parents and learners who question the logic of enrolling for an inferior education which cannot offer you a job. This lack of knowledge and skills condemned many rural women to perpetual poverty and total reliance on government for survival because they might not be able to participate in socio-economic activities of their communities. This condition under which rural women live call for Adult and Community Education and Training (ACET) programme to equip women with basic knowledge and skills for livelihood.

The lack of basic education could keep rural women in perpetual poverty. The governing party of the country, African National Congress [ANC] (1994) wanting to provide a better life for all South Africans, developed policies that placed emphasis on community development, through basic education (Victoria, 2014). There are millions of people ages 15 to 24-year-olds who are not employed and lack education and training and 3.4 million of these unemployed are concentrated in the countryside (Victoria, 2014). The high numbers of rural women who lack education, training and employment make it practically impossible for the current Post-school Education and Training System to offer satisfactory places to the majority who seek access to education. To solve the problem there is a need for an expansion of intake of people into the education system. The announcement regarding the establishment of Community Colleges is, therefore, a step in the right direction. The community colleges can enroll both youth and adults who require basic knowledge and skills for living (Victoria, 2014).

Problem Statement

A lack of basic education results in unemployment, poverty and social malfunctions among rural women. Most women in the rural areas are unemployed and live in poverty due to lack of education (Mayer et al., 2011). Adult learning centres have been opened in most rural communities in South Africa to redress the injustices of the past by providing adults, mostly women, with basic skills for survival. The problem investigated by this study is, what are the effects of the ACET programmes on the socio-economic life of rural women in the Lusikisiki area?

Research Objective

The objective of this paper is to find out how basic education can be used as a tool to enhance livelihood activities among rural women.

Theoretical Framework

This study is grounded on the Human Capital Theory. This theory emphasises the importance of investing in education and training to increase the chances of individuals in securing jobs and get improved wages (Guvenen, 2009). Studies have revealed the positive effect of the Human Capital Theory. For example, (Lockhead, Jamison, & Lau, 1980; as cited in Adelore & Olomukoro, 2015) reveal that the investment in education gives the opportunity to secure

higher paying jobs and brings about a better economic growth. Such an investment, therefore, seems relevant in providing returns in the form of individual skills attainment, economic success and accomplishment (Blaug, 1970; 1976; Karabel & Halseu, 1977; Akintayo & Oghenekohwo, 2004; cited in Oyitso & Olomukoro, 2012). To see rural women succeed in employment and better wages there is a need for an investment in their education. Adelore and Olomukoro (2015) maintain that the Human Capital Theory emphasises the need to invest in education for better economic development such as employment and better earnings. In other words, this productive outcome of investment in education must be visible in the lives of rural women involved in ACET programmes. This, in fact, is in line with the definition given by Luthans, et al (2004) that human capital is an individual's knowledge, skills, and productive abilities.

Human Capital Theory is relevant to this study because it focuses on the importance of investment in the education of individuals, especially rural women. Investing in the education of rural women will ensure that they are gainfully employed and improve their socio-economic status. Adelore and Olomukoro (2015, p. 318-319) emphasise that without investment in human capital, skill will not be acquired, and if a skill is not acquired the authors of this paper maintained, there cannot be any meaningful employment. There is, therefore, a need to consciously invest in women with skill and knowledge through ACET programmes for employment. Arguably, it is through the attainment of knowledge and skills that rural women can create their own employment take control of their lives and engage in social and economic activities of their communities.

RESEARCH DESIGN AND METHODOLOGY

Research Design

A qualitative research approach in the form of a case study was designed for the study to explore the worth of adult and community education and training as a tool for employment. This design was appropriate because it dealt directly with the real life experiences of participants (O Cinneide, 2006) which are unemployment, lack of skills and poverty. This approach according to Nambinga (2009) qualitatively helps the researchers to discover information and knowledge about the nature of the reality of the phenomenon under study.

Data Collection

The investigators used interviews to collect data from women ACET learners. In the process of data collection, 25 women were purposively selected from a population of 116 to participate in this case study. The 25 women were purposively selected because as ACET learners they were information rich and as such could contribute immensely to the study. During the interview process, the researchers asked probing questions for a better response and to elicit more information from participants (Harrell & Bradley, 2009). The researchers used probing as a technique to validate the research instruments. The interviews conducted lasted over a period of five days, and each interview lasted 45 minutes. The interviews were conducted at selected centres. These centres were selected because they were appropriate and easily accessible to all participants. The researchers travelled to the centres to conduct the interviews. Interviews were audio recorded with the permission from the participants. These recordings were later played and transcribed into text by the researchers. Themes were drawn, coded and discussed (Nichols, Tacon & Muir, 2013). A good conducive atmosphere that allowed participants to freely express their feelings and behaviours regarding the issues being discussed was ensured (Holley & Steiner, 2005).

Ethical Considerations

The authors of this paper adhered to all research ethical protocols. They ensured transparency, validity and reliability of the study (Chaska, 2008). Ethical considerations according to Creswell and Clark (2011), encourages researchers to respect the rights, needs, values and desires of the research participants. As suggested by Welman, Kruger, and Mitchell (2005), the researchers put into practice all research ethics which included: the research participants' privacy and confidentiality, permission, informed consent, voluntary participation and right to anonymity. In doing so the researchers wrote letters to the Department of Education and the Department of Adult Basic Education and Training in the Lusikisiki district for permission to conduct the study. They waited for a response before the research study could commence. The research participants were informed of their voluntary participation and purpose of the study. They were also informed that they could pull out of the study at any time if they wish to do so. Participants were assured that the information relating to their identity will not be revealed to any person or organisation. Any information given will be strictly confidential.

Data Analysis

In analysing data the researchers followed Rabiee's (2004) framework of data analysis which provides a series of steps that helped the researchers to manage data more easily. Data analysis is an ongoing process which begins with the process of data collection. Maree (2007) affirms that in qualitative research, data analysis is an ongoing process which begins right from the time data were collected to the conclusion of the research. The researchers, therefore, collected data, read through and pruned them thoroughly and transcribed for analysis. The data were given codes and arranged under themes or categories. They were interpreted using comparison and pattern analysis to refine and relate categories or themes and using different views.

Presentation of Results

In this section we present key findings from interviews conducted with 25 ACET women learners. The paper reveals the following results:

- Insufficient Enrollment Space into the System of Education and Training.
- Lack of Interest in Adult and Community and Education and Training (ACET) programmes.
- High rate of unemployment.

DISCUSSION OF FINDINGS

The findings of any study depend on the responses of the participants and how the researcher interprets the data. For this reason, the respondent voice is very crucial in the discussion of the findings. These findings were arranged and discussed under three main themes.

1) Insufficient Enrollment Space into the System of Education and Training

The devastating effect of the apartheid education system left millions of South Africans illiterate. Therefore, after the apartheid regime, the South African education system and training could not enroll high numbers of people needing education. For this reason, many rural women do not have basic knowledge and skills for social and economic development. This shows that the current Post-school Education and Training system, with particular reference to ACET failed to provide satisfactory enrollment space to the majority of adults

who seek access to education. To solve the problem there is a need for an expansion of intake of people into the education system.

This enrollment problem was in fact affirmed by one of the respondents when she said:

> *Many of my colleagues are sitting at home because they could not gain admission due to insufficient space at this centre. The centres in this area are too small and this makes it difficult for others to be admitted. As a result, there are many women sitting at home doing nothing.*

The response above indicates the need for more ACET centres in the rural areas in order to accommodate women who require learning and training in basic skills to enhance their livelihoods. This response makes it evident that the Post-School Education System cannot absorb the majority of rural women who lack basic knowledge and skills. This high numbers of women who lack basic education have contributed to the high rate of unemployment of many rural women. Mayer et al (2011) confirm that there are many unemployed people whose levels of literacy are such that they are practically unemployable. This is due to the fact that adult women did not have the required skills relevant to the available jobs. Low level of literacy and unemployment can lead to perpetual poverty because of lack of skills among rural women. To address this problem more adult learning centres should be provided in the countryside communities.

Many people in the rural communities feel the ACET centres do not equip them with basic skills for employment. The responses of some participants below affirm this;

> *I am not actually learning skills to do my own work or run my own business like dress-makers, bakers or being an electrician. The centre only gives me a certificate that I can use to find jobs in the community but, it is very difficult to find a job.*

Another participant said;

> *We are having a subject Agriculture Science but, we are not doing any practical work that will help us acquire the skill better. We are only taught the theory aspect which makes us not to do very well on the farm. We also need computer skills that will help us well.*

Yet another;

> *If we can have computer skills training, sewing and baking at our centre then it will help us to do better. We don't have these training here but this is what we need to help us.*

From the above responses, it is clear that ACET learners need skills training for employment and to be self-employed. Providing rural women with computer training will be an added advantage as mentioned by a participant above. Rural women desire to live better productive lives through the training they anticipated to receive from ACET. Rural women need skills to generate income. The emphasis placed on adult literacy alone makes it difficult for adult learners to achieve their study goals. As affirmed by Leibbrandt et al (2010) and Mayer et al (2011) the education system through the establishment of ACET has not delivered the employment skills needed by women. As such ACET has failed to solve the problems rural women face which included a lack of skills, poverty and unemployment. Unemployment turns to bring with it a number of social anomalies. These include crime, drug and alcohol

abuse, poor health, loss of self-esteem and social discrimination. Therefore, rural women should be empowered to deal with the wide range of concerns and problems they experience in finding employment (Ngcaweni & Moleke, 2007).

2) Lack of Interest in Adult and Community Education and Training Programmes

Most of the women in the study area lack interest in ACET programmes because the programmes do not meet the learning needs of the women. A participant confirmed;

> *I am not actually learning skills to do my own work or run my own business like dress-makers, bakers or being an electrician. The centre only gives me a certificate that I can use to find jobs in the community but, it is very difficult to find a job.*

The participant here confirmed that the ACET centre does not provide the much-needed skills (Leibbrandt et al., 2010) for rural women. The centre seems to focus more on literacy and not job skills. As a result, the women lack interest in the ACET programmes. This indicates the need to transform ACET curriculum to suit the living needs of participants. In fact learners should be involved in discussing ACET curriculum. ACET providers should do needs analysis before offering particular programmes.

3) High Rate of Unemployment

Although adults attend ACET programmes free because of poverty many rural women are unable to attend classes regularly. There are some who cannot afford taxi fares to attend classes regularly. As one participant put it;

> *I am unable to attend classes because I am not working. I do not have money for transportation so most of us do not attend classes regularly.*

The response above indicates that ACET centres are far away from the learners. The centres are not easily accessible to the women. This makes most rural women learners drop out of their training. Education through ACET is the best means to change the status quo of rural women. When rural women acquire knowledge and skills, they will be in a better position for self-employment. The lack of accessibility to the learning centres could deny many women the opportunity to acquiring skills for employment. Without the needed skills rural women may remain unemployed and poor.

CONCLUSION

The study explored how basic education can be used as an employment tool for rural women by equipping them with basic knowledge and skills for livelihoods. Adult and Community Education and Training (ACET) has been established throughout the country to equip adults with basic knowledge and skills for employment. However, many rural women either drop out or do not attend because the programme does not meet all their learning needs. The paper concludes that for ACET to have more positive impact on rural women the programmes must be tailor-made to address the felt learning needs of the participants.

RECOMMENDATIONS

Based on the findings the researchers provide the following recommendations: ACET organisers should do needs analysis before drawing up curriculum. This may increase the patronage of the ACET programme. The programme of ACET should put more emphasis on practical skills training to empower rural women with skills for self-employment. ACET

centres should be opened in all rural communities to make basic education more accessible to those who need it most.

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TECHNOLOGY TEACHERS' INTERPRETATION OF THE CURRICULUM: A CASE STUDY OF SOUTH AFRICAN SCHOOLS

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Abstract
There has been ongoing debate and extensive discussion in South Africa on how Technology Education teachers interpret and implement Technology Education curriculum in schools. This descriptive case study research aim at investigating how the Technology teachers interpret the interrelationship between the Technology-Society-Environment (TSE) theme and the Technological Process and Skills (TPS) as well as Technological Knowledge and understanding (TKU) curriculum themes of the Technology learning area in South African schools. Data were collected in the form of classroom observations and interview from four teachers from different schools in Mpumalanga province. Teachers work schedules, learners' workbooks as well as their project portfolios were also observed for indication of how Technology Education curriculum was being interpreted by the teachers. The data were analysed using content analysis; codes were used to establish the emerging themes in line with the research questions. The findings of this study show that only in exceptional cases that the teachers make use of learner centred approaches in their teaching. It is evident from the findings that while teachers planned learner centred approaches in their lesson plans, learners themselves do not show any examples of such integration in their workbooks. Teachers' difficulties with specific knowledge areas of the Technology curriculum were discussed and recommendations were made.

Keywords: Curriculum, Technological Knowledge and understanding, Technological Process and Skills, Technology Education, Technology-Society-Environment

INTRODUCTION

Technology Education emerged as a subject in its own right in many countries around the world in the past three decades (Jones, Buntting, & de Vries, 2011). The subject's philosophy compared with other discipline is relatively young and its emergence comes from the background of technological practice and engineering (Jones, Buntting, & de Vries, 2011). Different bodies both globally and nationally have made efforts to develop policy related to the teaching and learning of Technology in schools, and to produce associated syllabus and supporting documents (American Association for the Advancement of Science, 1993; International Technology Education Association, 2000). The major goal of policy and syllabus documents is to ensure that all teachers engage their students in effective technology learning experiences that challenge them to think in-depth about relevant Technology content and processes in a learning environment that was founded on the contemporary pedagogical practices (American Association for the Advancement of Science, 1993).

Technology Education is a relatively new subject in the South African curriculum and was not being catered for in the general schooling system prior to 1998. Even with the introduction of Technology into the school system, there were no teachers to teach the subject because teachers did not have formal training in Technology Education. The department of education however, relied on pilot programmes run by non-governmental organisations (NGOs) to capacitate teachers in this subject area. Technology as a subject has concepts that

were new to teachers and somehow difficult to conceptualise, as it needed a background of mathematics, science and vocational subjects. Most teachers did not have the background in these subjects. This led to some schools not giving much priority or value to technology compared to mathematics and science (Williams, 2011). The subject's philosophy is still not that clear in many quarters as compared to science.

In developing countries of sub Saharan Africa, science and technology feature as central subjects in the school curricula (Hattingh, 2004). According to Cheek (1992), Science and technology have influenced the twenty-first century society to a considerable extent. A critical study of this group of subjects with related influences is known as Science-Technology-Society (STS). STS is viewed in literature as the study of how social, political and cultural values affect scientific research and technological innovation, and how in turn they affect society, politics, economy and culture (Cheek, 1992; Pedretti, 2003; Jones et. al., 2011). The scientific and technological innovations assist in realising existence of the socio-technological relationships between technical objects, the natural environment and social practice as centred in STS (Ropohl, 1997). Although Zeidler, Sadler, Simmons, and Howes (2005) argue that while STS emphasises the impact of scientific and technological development on society, its focus on the moral and ethical issues was not explicitly embedded in decision-making. In the past four decades, the STS approach has expanded to Science, Technology, Society and the Environment (STSE) to emphasize the environmental aspects (Predretti, 2003, Jones et al., 2011). The STSE programs interpret science and technology as socially embedded enterprises that promote the development of a technologically literate citizenry who are able to understand STSE issues (Predretti, 2003).

In the South African context, Science-Technology-Society (STS) forms part of the Technology curriculum as specified in the Revised National Curriculum Statements (RNCS), (2002) which was implemented in 2003. In the Technology curriculum, STS was referred to as Technology-Society-Environment (TSE), which involves teaching attitude and values towards technology (DoE, 2002b). The inclusion of TSE in teaching Technology have the potential of making the curriculum more relevant and learning more meaningful as it provides scope for teachers to engage learners with different real life contexts in constructing knowledge (Naidoo, 2010). Technological knowledge and understanding (TKU) comprises of conceptual knowledge while technological process and skills (TPS) covers procedural knowledge and their components. These three themes are conceptualised around the goals of the teaching Technology for Grade R-9. The realisation of the unique features and scope that form part of the official and intended curricula, need to be interpreted in an interrelated manner by the technology teachers.

From afore-going, it is not yet clear whether technology teachers are teaching Technology subject using integrative approach to realise the interrelationship of the themes from the TSE perspective. Therefore, this study's aim is to establish how teachers interpret and enact the interrelatedness of technology themes from the TSE perspective. In line with the aim, answers were sought for the following research questions;

- How do technology teachers interpret TSE in the technology curriculum?
- How do technology teachers link TSE to the other themes in technology?
- How do technology teachers approach the themes from a pedagogical perspective?
- What barriers do teachers identify in their intentions and attempts to teach the relationship between TSE and other themes? How could these barriers be addressed?

Theoretical framework

The study adopted and adapted Rogan & Grayson's (2003) theory of curriculum change to articulate the position of teachers' understanding about the integration of TSE theme with TPS and TKU themes during planning and teaching. This theory is based on the three constructs for analysing school implementation: (1) profile of implementation, (2) capacity to support innovation, and (3) support from outside agencies. (Rogan & Grayson, 2003; and Aldous & Rogan, 2009) identified sub-constructs within each construct. This study focuses on construct (1) the profile of implementation under the sub-construct science in society but contextualised as technology in society, detailed in its four levels of complexity in the Table 1. below:

Table 1. Profile of implementation contextualised as technology in society (*Adapted from Rogan and Grayson, 2003*)

Level 1	Level 2	Level 3	Level 4
Teacher uses examples and applications from everyday life to illustrate technological concepts. Learners ask questions about technology in the context of everyday life	Teacher bases a lesson (or lessons) on a specific problem or issue faced by the local community Teacher assists learners to explore the explanations of technological phenomena by different cultural groups	Learners actively investigate the application of science and technology in their environment, mainly by means of data gathering methods such as surveys Examples here might include an audit of energy use or career opportunities that require a technological background	Learners actively undertake a project in their local community in which they apply technology to tackle a specific need. An example might be on investigating the problem/need to bring solution to the community Learners explore the long-term effects of community projects. For example, a project may have short-term benefit but resulting long-term detrimental effects

The technology in society sub-construct is conceptualised around the three themes of the Technology curriculum with TSE as a focus point in the middle to show the flow of ideas through the themes. These themes are TKU (conceptual knowledge), TSE (technology society and environment) for attitude and values and TPS (procedural knowledge) with their different components. The three themes are conceptualised around the broad aims of the Teaching Technology subject for Grade R-9 of the Curriculum assessment and policy statement (CAPS). The realisation of the unique features and scope that form part of the official and intended curricula, need to be interpreted and enacted in an interrelated manner by the technology teachers. The CAPS technology curriculum framework lies with the intentions of the curriculum designers and the case to be measured. The framework is intended to describe the technology curriculum and its level of implementation with a particular focus to TSE.

METHOD

Research design

The research design for this study is a descriptive and interpretive case study that is analysed through qualitative methods. Multiple-case studies (comparative) were applied in the study to obtain an in-depth analysis.

Sample

The subjects of this study were four technology teachers from four different schools in Mpumalanga district of South Africa. Purposive sampling was adopted in this study in order

to provide sufficient insight and understanding of the enquiry in this study. These teachers' experiences ranged from 12 to 26 years. These teachers were chosen based on the fact that they have in-depth knowledge about the knowledge of planning and teaching the Technology learning area in South Africa.

Data collection instruments

The main data collection techniques used in this study were semi-structure interviews, non-participatory classroom observations as well as the document analysis.

Semi-structured interviews

Semi-structured interviews were used in this study in order to enable the researchers to formulate the questions and modify them to suit the context as new information emerged during the interviewing process. The interviews were conducted for approximately 30 minutes with all the four participants. Teachers were first asked about their experiences about technology education and their awareness of the themes in the technology curriculum. The questions then explored teachers' understanding of the relationship that exists among technology education themes in the curriculum. Later they were asked about their interpretation of technology, society and environment theme and the roles that they think this theme plays in teaching technology. The interviews also explored what students should be learning in technology and how the subject should be taught in schools.

Non-participatory classroom observations

Non-participatory classroom observations were carried out in order to evaluate learners' involvement and engagement during technology lessons. The first author visited the participating teachers a week prior to the observation sessions to become familiar with their environment and to interact with them. Lessons lasting for 45-60 minutes were observed as scheduled in the school time so there was no obstruction to the normal running of the school timetable. The observations helped in triangulating the interviews data.

Document analysis

Document analysis of the teachers' lesson notes (worksheets and or activity sheets) were carried out to identify any evidence of addressing the TSE in the planned activities. The researchers also looked at the type of work produced by the learners in the technology learning area, i.e. project portfolios and their workbooks to establish the interrelatedness of the themes in which the learners were engaged in.

Data Analysis

In this study, the data collection and analysis went hand in hand in an iterative manner in that the results of the analysis helped in guiding the subsequent collection of data. The researchers audio-recorded the interviews, transcribed and coded the content based on interview questions and responses. The researchers used codes to establish the themes categories in line with the research questions. The theme categories identified were; teachers' experiences of technology subject, interpretation of the technology concepts, planning and preparation of technology activities and barriers encountered in integrating the themes.

RESULTS

Investigating teachers' interpretation and their understanding of interrelationship of the Technology-Society-Environment (TSE) theme with the other technology curriculum themes

revealed their difficulty in talking about a subject that is just gaining its feet within South Africa context. Teachers used their experiences in and out of school to construct their interpretation of technology education curriculum.

Teachers' experiences of technology subject

Technology teachers talked about technology in terms of the subjects that they teach. They expressed what they and their students enjoy most about technology, they also explained their difficulties in teaching the subject. For example, participants' responses to the interview question on their experiences about planning and teaching technology in their classroom are presented below;

Researcher: Can you please tell me about your experience in planning and teaching technology in your classroom?

Teacher 1*: Technology is the most interesting subject, teaching technology is very simple when we have the relevant resources. I think technology also links with what learners are doing at home.*

Teacher 2: *It is very difficult, most of us do not understand the concepts of technology because the subject is still new we struggled a bit but as years go by we were able to do the right thing may be the right thing at least simpler. We now knew how to explain to the learners how these concepts, and know how to prepare for the lesson properly.*

Teacher 3: *Ok, my experience in planning and teaching technology in my class, I usually focus on the three themes. I make sure that the AS (assessment standards) are informed by the three technological themes.*

Teacher 4*: Umm…the experience I have is that most learners enjoy doing technology as a subject. Before I go to class to teach I make sure that I plan very thoroughly and I know my things very well because it might happen that I find these intelligent learners who ask me different questions then I plan very well but the challenge is sometimes you find that we do not have much resources, so we improvise sometimes.*

Further evidences from the document analysis also revealed teachers' experiences with teaching technology learning area. For example, in the case of **teacher 1**, the researchers analysed the work schedule for Grade 7, the lesson plans, the learners' written work, and the project portfolios. The results of the analysis of teacher 1's documents showed that teacher 1's work schedule contains substantive evidence of each of the categories of information, concepts, principles; approach to the nature of technology inquiry; relationship to everyday life as well as image of technology. Further document analysis revealed that information in teachers' lesson plans presents some technology information and concepts in relation to Technological Processes and Skills (TPS); and Technological Knowledge and Understanding (TKU), but none on TSE. The aspects of TKU are dominant in both lesson plan and learners' workbooks. In conclusion, the learner's exercise books, the project portfolios and the teacher's lesson plans did not have any contextualising references that conform to the TSE theme. This could mean a lack in the interpretation of the work schedule content when developing the lesson plans and the learners' activities that need to be contextualised with reference to TSE.

Teachers' interpretation of technology concepts

Teachers highlighted some of the difficulties they encounter in understanding and teaching the concepts of mechanisms in the topic systems and control of technology. The following comments reflect the views of all of the technology teachers to the interview questions *"What is your interpretation of technology, society and environment (TSE) theme in technology education?"* and *"what role does TSE play in planning technology activities?"*

Teacher 1*: As learners know that they are busy, teaching technology helps us in the community. The learners must be fruitful in their community to do things on their own not to buy. TSE helps us to understand what is happening in our society.*

Teacher 2: *My interpretation on this is that learners must know the technology they are familiar with today and how it was done, before the impact of this change to the society also if the environment how does it affect the environment now and before and also the bias part of it if favouring them now or before. TSE plays a very important role though our learners they do not know the things done long ago our learners cannot be able to match what was done before because they have no idea of what happened before*

Teacher 3: *TSE theme in technology curriculum focuses on the impact, biasness in particular society and environment. TSE enables us to recognise and identify the positive and negative impact of technology in society and environment so as to improve people's quality life and come up with strategy for reducing any undesirable events.*

Teacher 4*: My interpretation is that the TSE is whereby we talk about the indigenous thing whereby we have to involve things in fact they say technology it was there before is an olden thing even if they have not used it but it was there the olden people know this thing very well. Technology enables the learners to be aware that the nature should not be disturbed and again they are familiar with the environment and they make sure that they should not harm the environment and the people around it.*

Both teachers 2 and 4 managed to describe the relationship that exists among the themes in technology while teachers 1 and 3 did not clearly describe their understanding of the relationship that exists among the themes. While teacher 2 articulated her understanding of TSE without difficulty, she was not sure about the role TSE plays in the teaching of technology as she related it to history.

Further classroom observation confirmed that teacher 1's comparison of the role TSE plays in her teaching and what is happening in society was not in line with the lesson that she presented during observation. Teacher 1 taught these concepts out of context, though she tried to clarify the concepts from the beginning and gave relevant examples but failed to link with the context. Although it was a small-scale observation, one might suggest that this could apply to other lessons, as she mentioned during the interviews that she had a problem when it comes to machines.

On the other hand, during the lesson observation in a Grade 9 class, lasting an hour, teacher 4 brought a bicycle to class. Her lesson was about mechanisms with the emphasis on gear systems. She engaged the learners in identifying the different gear systems of the bicycle and in drawing them on their worksheets. Although her lesson was more of learner centred

approach, which paid more attention to the knowledge component than on demonstrating the interrelationship amongst the three technology themes.

During the classroom observation for teacher 3, he taught his learners about mechanisms and their mechanical advantage. The focus was on levers. The teacher assisted in the development of understanding of the concept by setting a context in which levers are utilised to lift loads. However, he lost the opportunity of making learners aware of the impact of levers in their real life context. He could have expanded on the lifting of loads using high technology of which learners should be aware, but the lesson focused more on the means used in indigenous technology to move a heavy load. Of all the observed lessons, only teacher 3's lesson presentation mentioned indigenous technology (a component of TSE) as the context of the lesson.

Planning and preparation of technology activities

The following responses to the interview question "*what kind of activities do you give to your learners?*" reflect the kind of activities teachers engage their learners in and out of the classroom.

Regarding preparation for teaching, teacher 1 affirms that technology is an interesting subject to teach provided there are relevant resources as the nature of the subject links with what learners are faced with on a day to day basis. She conceded that:

Teacher 1: *When we plan technology, we find it difficult because it needs resources and it needs more work that is practical.*

Teacher 1 further described the process of planning her classroom teaching as follows.

Teacher 1: *I focus on the learning outcomes and assessment standards focusing on the learning content and learning context, aims and objectives and also considering integration of other learning areas and taking into consideration the duration of the lesson as important. The other aspect I consider is prior knowledge as linking prior knowledge and learning context helps learners to understand better.*

The expression above shows that *teacher 1* found it difficult to plan, and cited the lack of resources and practical kits.

Looking at planning further**,** teacher 2 describes the way she plans activities for teaching as follows;

Teacher 2: *I usually check the policy documents on the themes and check the assessment standards. Then I have to look at first the main assessment standard, then I will go and check with the other themes that one has to match with this assessment standard and I am correlating with them in designing for instruction.*

Teacher 2 identifies objectives as the way to check whether the themes are properly covered. She describes this process as follows. "*I always, but sometimes when you teach the learners one of the themes when interacting with learners if one of the themes fails the objective is not achieved".* She pointed out that the objectives are derived from assessment standards.

Teacher 3 explained his experiences in planning as follows;

Teacher 3: *My experience in planning and teaching technology in my class, I usually focus on the three themes described in the technology curriculum. I make sure that the assessment standards are informed by the learning outcomes and the learning outcomes are derived from the three technology themes.*

Teacher 3 describes the extent to which he engaged TSE when planning as follows; "*In designing my instruction I normally engage learners in TSE in my teaching and learning activities because this theme addresses day-to-day problems in the society*".

Teacher 4 explains her experience in planning and teaching technology as follows:

Teacher 4: *The experience I have is that most learners enjoy doing technology as a subject. When I attend to them, I make sure that I plan very thoroughly and I know my things very well because it might happen that I find these intelligent learners asking me different questions. Then I plan very well but the challenge is …sometimes you find that we do not have much resource so we improvise something…when designing for teaching and learning I make sure that I am familiar with TSE (theme) so that I may be able to impart this knowledge to learners.*

Teachers 2 and 4 understood how technology activities are to be planned in an integrated manner as described in the lesson planning processes. Teacher 4 could not clearly describe or explain her planning of technology activities. None of the four participants was clear on how to engage TSE during planning.

Barriers encountered in integrating the themes

Teachers identified the following barriers during the interview sessions;

Teacher 1 indicated that the barriers that she experienced in interrelating the themes are too few periods, a shortage of learning materials and limited resources.

Teacher 1: *There more barriers because first learners are divided into three groups gifted, average and those needy and we know that technology has lesser number of periods. Minutes are very short, the more you teach and time is running out and there is a problem of learning materials … if we have more material that enable learners to do practical that would help those needy learners.*

Teacher 2 does not have a problem with planning but the main problem is when dealing with difficult concepts and conceptual content in technology. Being clustered with teachers who themselves are not trained to teach technology but are teaching it in their respective schools, is not helpful.

Teacher 2: *There are barriers … sometimes it come to this one - the second one - technological knowledge and understanding, as I have said, something that I do not understand becomes difficult to pass the knowledge to learners. And even if I want to prepare the lesson, I get stuck because I do not have more information. Sometimes the textbooks are problematic they do not give us more information. Sometimes you get stuck when you look for help and you tend to overlook such. In our cluster most teachers will tell you [switched to her*

mother tongue] leswi hina ahi switivi leswi swa matechnology vo hi nyika leswi ahi switivi [meaning this technology is just allocated to us and we do not understand its content] so you find that you are a group of people who do not know anything…. We as technology educators, we normally do not get enough training in this regard (referring to interrelating the themes).

Teacher 3 identifies a barrier in a lack of proper training in interrelating the themes.

Teacher 3: *We as technology educators, we normally do not get enough training in this regard (referring to interrelating the themes).*

Teacher 4's barriers are resources and difficult concepts such as mechanisms.
Teacher 4: *Number one is the lack of resources; we do not have resources to teach technology as a subject in our school. For instance, when we want to make … mechanical system, we did not have resources to make those driver and driven gears. Instead, we improvised by drawing it on the chalkboard. Since … is a practical, it needs something that … we must cut until they understand.*

Suggested solutions to these barriers:
Teacher 1 spends extra time with weaker learners after school. Teacher 2 thinks a solution is to re-train technology teachers through further studies. Teacher 3 suggests that schools be supplied with the required resources in technology. He also suggested the establishment of supporting teams starting from school level up to district level conduct workshops led by experienced and well-trained teachers to deal with technology education related problems. Teacher 4 currently deals with barriers of lack of resources by giving tasks and small projects to learners to do at home.

DISCUSSION OF FINDINGS

This study explored how the technology teachers interpret the interrelationship between the Technology-Society-Environment (TSE) theme and the Technological Process and Skills (TPS) as well as Technological Knowledge and understanding (TKU) curriculum themes of the technology learning area in South African schools.

The data analysis revealed that work schedules and somewhat project portfolios contain some unifying concepts across the technology themes. However, teachers find it difficult to understand some concepts in the Technology curriculum. The analysis revealed that there was little mention made of societal issues that reflect the aspects of TSE, and this posed a challenge for some teachers in the sample. Despite teachers being familiar with the themes in the Technology curriculum, some are not sure of what the role of TSE is in planning and teaching. This might be a reason why Technology concepts are being taught out of context and as a result affect learners' conceptual understanding of the content being taught.

The analysis further revealed that although all the documents promote learner involvement in learning concepts to the level of concrete understanding (somewhat), both novice teachers and one experienced teacher did not emphasise the context to show the influence of TSE in their planned activities. What the experienced teachers claimed during interviews on the planning process, did not translate into activities that allow learners to grasp the nature of technology.

Selecting subject matter and implementing it is core to planning and teaching. The analysis revealed that the teachers' curriculum documents in both categories somewhat contain specific objectives or outcomes, but setting the context is poorly addressed in their planning. The teachers in both categories view the pedagogical approaches in the technology curriculum differently. For this reason, the realisation of the interrelationship of themes are explained differently during the interviews. The observations reveal that the teachers used different approaches for the different aspects, and that none of them operates on Level 3 of the construct of implementation, which would give a true integration of themes and satisfy TSE theme of the curriculum.

The analysis reveals that there were more failures than successes in integrating the themes. Some of the failures were attributed to planning and lack of support from the school's authorities in providing re-training programme for Technology teachers so that they can understand the subject matter better. The rest of the barriers for effective Technology teaching and learning in schools are lack of instructional materials that can be used to enhance teaching and learning processes, lack of proper training in interrelating the themes as well as having to deal with difficult concepts in the technology curriculum.

CONCLUSIONS AND RECOMMENDATIONS

This study established that teachers need assistance beyond their qualification to interpret and teach the Technology curriculum successfully. The participants expressed their frustrations with the policy and subject content issues to such an extent that something ought to be done about the status of Technology teaching in the sampled schools. This study reveals that there are no enough support programmes to support teachers to understand the subject adequately. There is a need to base Technology teaching on real life or authentic context or technological practice. It is clear from the study that the teachers require appropriate support to interpret the Technology curriculum documents and to translate them into classroom teaching. The insight gained in this study, about the way teachers interpret and enact the integration of Technology subject themes, could be seen as the springboard for the Department of education support staff and Higher Education institutions. In order to design support programmes that will equip pre-service and practicing technology teachers to understand better the content and the dynamics of the subject that are useful in the classroom environment.

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CAN LECTURERS REFLECT ON AND IN THE USE OF MOODLE PLATFORM ON STUDENT SUCCESS?

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Abstract:
An important development in higher education is the demand to adopt new educational technology and information to frame student success. In response, Moodle Learning Management Platforms (LMP) provide informal and formal curricula which brings challenges to lecturers and they seem reluctant to embrace it for student success. This article presents a qualitative critical action research of three out of eight lecturers. Purposive with convenience sampling were used to choose the three most accessible lecturers who were teaching science modules. The article aimed to explore lecturers' reflections on the impact of Moodle curricula on student success. The lecturers' reflective activity and one-on-one semi-structured interview were utilized for data generation. This was driven by two research question namely: what are lecturers' reflections on and in the use of Moodle curricula to attain student success? and why do lecturers reflect on and in use of Moodle curricula using particular ways to attain student success?. Inductive and deductive processes were used to ensure qualitative guided analysis of the generated data. Triangulation, transferability, dependability, confirmability and credibility was maintained to ensure trustworthiness. The study concluded that lecturers were using formal reflections to be more familiar with formal curriculum than informal curriculum of Moodle, and this impaired student success. Consequently, this article recommends lecturers to use reflective process to align informal with formal Moodle curriculum in order to attain student success.

Keywords: curriculum, Moodle, reflections, science modules, student success

Introduction

The ever changing conditions on political and socio-economic status reshape higher education institutions (universities) around the world (Africa, Asia, Australia, the United States and Europe), and this pressures higher education management to adopt emerging LMP such as Moodle, Blackboard and others for implementation of curriculum in order to attain student success (university throughput or outcomes) (Waghid- & Davids, 2016). Note that, "Institutions, educators and students in higher education are increasingly challenged by governments to contribute to national economic achievement. One aspect of this challenge is a drive to improve student success" (Zekpe & Leach, 2010, p. 166). In response to this, universities in developing countries like South Africa, Ghana, Nigeria, and others have adopted Moodle LMP to manage teaching and learning of modules. Moodle is a free-open-source software LMP which stands for Modular Object-Oriented Dynamic Learning Environment used for teaching and learning of module content (formal curriculum). It is designed for social constructivist learning (Informal curriculum) (Jackson, 2017). In other

words, Moodle LMP consists of both informal curriculum (horizontal curriculum) and formal curriculum (Vertical curriculum) which plays a major role to drive teaching and learning in order to attain student success (Anderson, 2016; Khoza & Mpungose, 2017). Surprisingly, the lecturers' lack of bringing an alignment between these two Moodle curricula has had negative impact on students success, and is becoming the world wide challenge that is required to be tackled in order to enhance quality, effective teaching and learning process, especially of science modules (Khoza, 2017). As a result, the next section presents the literature on understanding of student success, Moodle curriculum, and reflections as depicted in figure 1 below

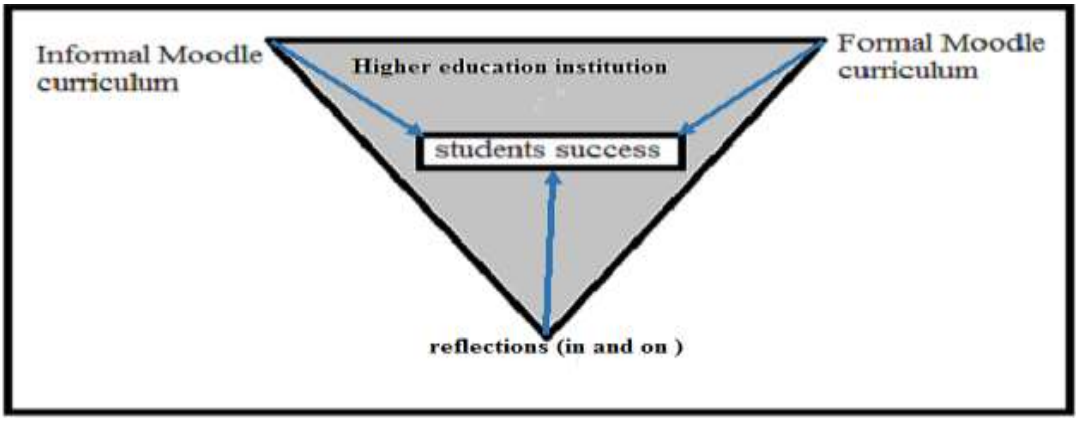

Figure 1: Main pillars framing student success

Student success and Moodle

The literature indicates that in the past few years, student success was not the priority over any other matter in most HEIs but the issues of high figures of enrollment, student grants, infrastructure, and other measurements of success were given the priority (Espinoza-Herold & Gonzalez-Carriedo, 2017). According to Zekpe and Leach (2010) students success is recently at the centre and becoming the major issue in higher education policies because universities are now funded based on graduation rates, retention, time to degree completion, postgraduates degree completion, job placement and other measures. As a result, student success is referred to as a favorable or desirable student outcome, which may be seen through student retention (re-enrolment of students), educational attainment (degree complete), academic achievements (cum laude and summa cum laude), student advancement (getting jobs you were trained for) as well as holistic development (intellectual, social, ethical, physical, spiritual development) (Cuseo, 2007; Espinoza-Herold & Gonzalez-Carriedo, 2017). This suggests that students' success is about embracing the personal development of students in order to address the goals of higher education. Khoza (2017) assert that one of the ways to put the students' best interest first is to create the social platform/programs/practices (informal curriculum) where students can bring in their social experience in order to unpack the module content (formal curriculum) for their own academic excellence. As a result, one way of improving student success in this digital age, is for HEIs to invest in educational technology (LMPs) like Moodle, and students (digital natives) often do enjoy Moodle LMP more than lecturers (digital immigrants) during teaching and learning

(Bates-, 2016). In other words, Moodle LMP consist of informal and formal Moodle curriculum.

Informal/horizontal Moodle curriculum

Informal/horizontal Moodle curriculum places the student at the centre in order to address the student success/needs, teaching and learning is driven by learning outcomes (goals achieved by student at the end of programme) (Bernstein, 1999; Hyland, Kennedy, & Ryan, 2006). In other words, a student controls teaching and learning by actively engaging in the process through sharing of ideas. According to Govender' and Govender- (2014) facilitation of the content is done on an online Moodle platform where students can use their experiences to unpack the science modules content like acid reaction (Physical Sciences), geometry (Mathematics) and organic molecules (Biology). In other words, software resources like Moodle LMP is actively used to engage students to socially construct their own ideas through social experiences shared during teaching and learning (Khoza & Mpungose, 2017). Executing of assessment is linked with learning outcomes such that it addresses the module learning outcomes such as allowing the discussion of assessment tasks (discussion forums), and workshops (peer assessments) (Anderson, 2016; Black & Wiliam, 2009). According to Khoza (2017) lecturers facilitate activities from informal Moodle platform which are student-centred, and they are developed to address student needs in order to attain student success. All the above assertions from the literature (informal Moodle curriculum) seem to make the move to address the current discourse of helping students to succeed, and this suggests that the informal Moodle curriculum (Moodle LMP) is one of the preferred curricula to be used in order to embrace students success. Be that as it may, lecturers are also required to be aware of formal/vertical Moodle curriculum which forms the basis of any other curriculum in HEIs (Schubert, 2009). As a result, the following section will discuss formal/vertical Moodle curriculum.

Formal/vertical Moodle curriculum

Formal/vertical Moodle curriculum places the module or the subject at the centre during teaching and learning process, and it address the needs of the module offered (Berkvens, van den Akker, & Brugman, 2014; Bernstein, 1999). These studies further lament that, the teaching and learning process is driven by objectives, defined as goals attained by the lecturers at the end of each programme/lesson. In support of this assertion, the content is prescribed and sequentially followed step by step from the module outline (planned curriculum) based on specific discipline such as Curriculum Studies, Social Science, Engineering, and others (Khoza & Mpungose, 2017). Moreover, teaching activities are lecturer-centred, done on weekly bases, and this allows lecturers to use face-to-face teaching and learning platform such as lecture halls in order to address the module needs (Zekpe & Leach, 2010). Further to this, Khoza and Mpungose (2017) aver that hardware resources such as data projectors, laptops, desktop computers and others are used to assist lecturer to instruct

(lecturers' character) students of what to do following a certain structured patterns. Assessment of learning "tries to summarise the student learning at some point in time and it has been described as end-of course assessment" (Hyland et al., 2006, p. 21). The literature on formal Moodle curriculum indicated above suggests, that this curriculum is only consistent with lecturers needs, the module needs and excludes the needs of student (student success). In other words, it is the basic normativity that lecturers are employed by the university as technicians to deliver the module content (Msibi & Mchunu, 2013). This suggests that lecturers go to lecture halls to deliver and deposit the content to student without engaging them (student experiences for their success). As a result, this then contradicts with informal Moodle curriculum, and this may hinder student success. In response to this contradiction and confusion between two Moodle curricula (informal and formal), reflection is termed to be the solution (Dewey', 1933).

Reflections

According to numerous studies (Boud, Keogh, & Walker, 2013; Dewey', 1933; Khoza & Mpungose, 2017; Pedro, 2005; Schön, 1983; Van Manen, 1991) reflections are regarded as a processes or activities that are central to developing and improving practices in finding the solutions that hinders student success. Further to this, the concept of reflection-on-action and reflection-in-action was introduced in defining reflection phenomenon during teaching and learning of modules in order to attain students success (Schön, 1983). Studies sees reflection-on-action as the process of reflecting effectively on the past experience, and it calls for practitioners (lecturers/teachers) to reflect to see if their practices are aligned to studies/policies of the profession/university in order to support student success. Reflection-on-action is also called formal or vertical (Khoza, 2017). This suggests that this reflection seeks that lecturers reflect on all formal Moodle curriculum signals (objectives, hardware resources, face-to-face platform, assessment of learning, physical permission, character as an instructor, content-centred activities, weekly programmes and science module content) (Berkvens et al., 2014). Furthermore, Reflection-in-action can be defined as the capacity of a practitioner (lecturer) to think and react quickly, within any given present moment, when faced with any perplexing circumstances (Schön, 1983). This reflection is also termed to be informal or horizontal reflections (Khoza, 2017). Moreover, this reflection requires lecturers to reflect in informal Moodle curriculum signals such as learning outcomes, software resources, online platform, assessment as learning, financial permission, character as facilitator, student-centred activities, daily activities and science module content (Berkvens et al., 2014; Bernstein, 1999). Therefore, this discussion on reflection emphasises the use of both reflection in-action and on-action which addresses the module need (formal Moodle curriculum) and student need (informal Moodle curriculum) in order to attain the positive student success as depicted in the figure 2 below. Thus this study seem to be influenced by curriculum spider-web conceptual framework which address the concepts of curriculum.

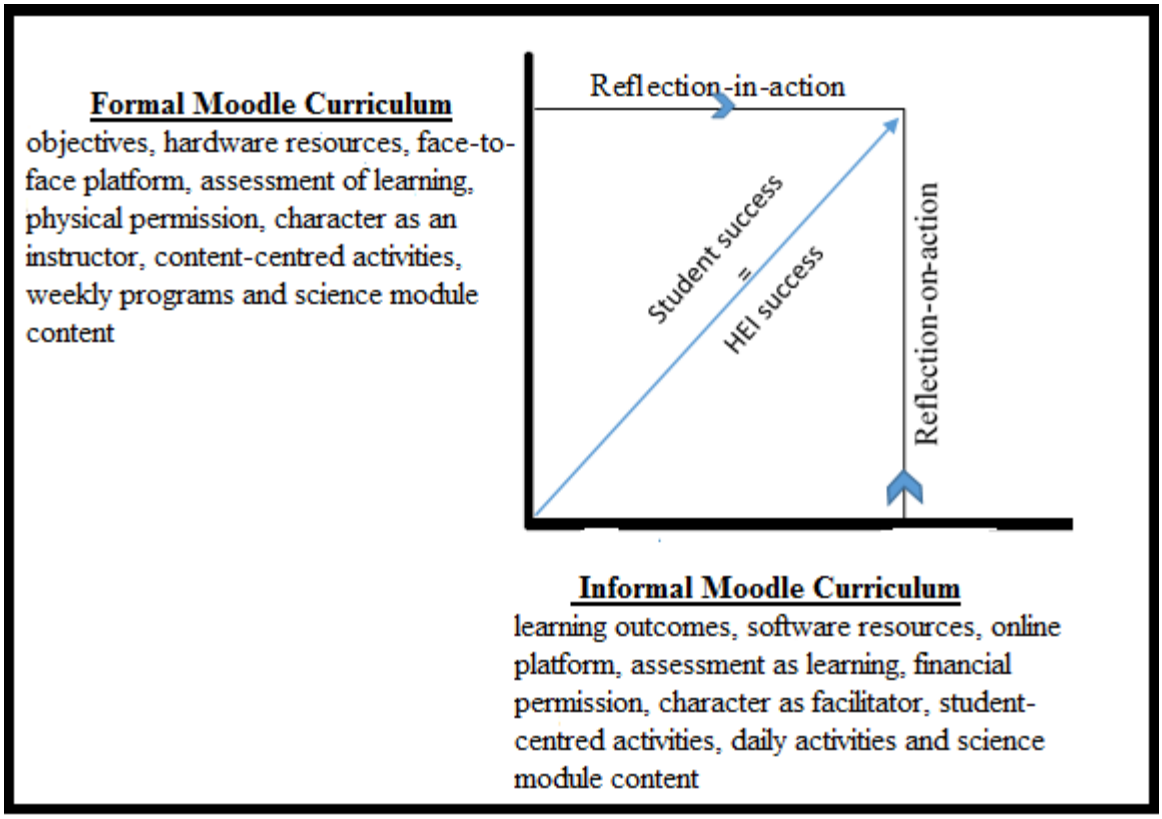

Figure 2: Attainment of student success

Research purpose/objectives

Therefore, this article intends to explore lecturers' reflections on and in the use of Moodle curricula to attain student success.

Research questions

From the lecturers reflections the following two research question were answered:

- What are lecturers' reflections on and in the use of Moodle curricula to attain student success?
- Why do lecturers reflect on and in use of Moodle curricula using particular ways to attain student success?
  1.

Research design and methodology

Paradigm and style

This is a critical action research study of three lecturers at a South African university. The main purpose of the critical paradigm is to interrogate the phenomenon which in turn may transform the participants (Ramrathan, 2017). Action research deals with a specific context, which may not represent the whole population, with an aim to create a reliable generalisation (McNiff, 2013). However, transferability remains a possibility. Action research is subjective

but in-depth, open-ended, exploratory and transformative in nature; it is conducted on entities in their own natural settings where lecturers research their own practices with the aim of improving their teaching situation (McNiff, 2013; Ramrathan, 2017). A combination of the critical paradigm and action research is important for this study because it is transformable, holistic, explorative and contextual in its nature (McNiff, 2013). In other words, lecturers may transform the way they use Moodle LMP in order to attain student success. Moreover, the study used a critical action research process in order to help the participants to learn to plan, implement, observe, and reflect on their behaviour in order to improve their practices (McNiff, 2013). The data were generated from the reflection stage as the final stage of action research.

Sampling

Purposive sampling was used in selecting the only three academics from the population of eight lecturers who used Moodle in teaching science modules at a South African university. Purposive sampling is useful for selecting a specific group with specific unique qualities (Creswell', 2013). The three lecturers were teaching science modules namely Physical Science, Biology and Mathematics. Creswell' (2013) reveals that convenient sampling is referred to as a process of choosing a smaller, more manageable, number of participants who are easily accessible to take part in a study. As a result, I conveniently chose only lecturers who were teaching different science modules using Moodle, who were easily accessible, and who were available to participate in the study.

Ethical issues

The names of lecturers as participants were not revealed because of ethical considerations, as suggested by Cohen, Manion, and Morrison (2013). Informed consent and ethical clearance were acquired and obtained in terms of confidentiality, voluntary participation, and withdrawal whenever they felt the need. Lecturers were made aware of issues of benefit and anonymity in such a way that acronyms (Lecturer 1, 2 and 3) were used instead of their real names. The ethical clearance certificate was applied and obtained from the local ethical guidance committee of the university.

Data Generation

Methods used in this study for data generation were reflective journal, and one-on-one semi-structured interviews. The participants kept reflective journals, which they generated and used during their teaching of science modules using Moodle LMP. Thirty minute interviews with each of the participants were conducted twice within which the participants were asked to reflect, through writing, on their use of Moodle LMP. The different questions asked: for example, who advised you to use Moodle LMP? (reflection-in-action); what

books/studies/content do you read on the use of Moodle LMP? (Reflection-on-action); and sub-questions for probing were also used (Creswell', 2013; Ramrathan, 2017). The interviews were used to add some sub-questions in order to probe for more data and rephrase the questions where necessary in order to accommodate those participants with a tendency to avoid certain questions (Cohen et al., 2013).

Trustworthiness

Multiple sources of data were used for the purpose of enhancing authenticity of data and achieving measures of trustworthiness, and an audio-tape was used to record the interviews for ease of transcription (Ramrathan, 2017). Therefore, the five processes of trustworthiness were involved and observed in this study namely: triangulation (different data sources used), transferability (finding will be beneficial or applicable to others), dependability (direct quotations from participants), confirmability (findings confirmed by participants) and credibility (same sources of data used for similar results) (Cohen et al., 2013).

Data analysis

Moreover, the study utilised qualitative guided analysis, where themes and categories were set while some emerged from the literature and generated data in terms of data analysis, this study used inductive analysis where two themes and categories emerged from the data and literature (Table 1) (Christiansen, Bertram, & Land, 2010). The codes used for data analysis in theme one were formal Moodle curriculum (driven by reflection-on-action), and informal Moodle curriculum (driven by reflection-in-action) (Khoza & Mpungose, 2017).

Findings

Table 1. Themes and categories

2. Themes	3. Categories
1. Formal Moodle Curriculum	4. Objectives, hardware resources, face-to-face platform, assessment of learning, physical permission, character as an assessor, content-centred activities, weekly programs and science modules
2. Informal Moodle Curriculum	5. Learning outcomes, software resources, online platform, assessment as learning, financial permission, character as facilitator, student-centred activities, daily programs, and science modules

Theme1: Formal Moodle curriculum

According Jackson (2017) and Bernstein (1999) formal Moodle curriculum is referred to as a curriculum that allows lecturers to use Moodle LMP only for teaching the module content such as science modules; and this curriculum is also called performance, collection, or vertical curriculum. Note the following accounts of lecturers teaching science modules (Physical Sciences, Biology and Mathematics) after they reflected on their action (teaching of modules using Moodle).

Lecturer 1 accounts reflects that, '*Moodle LMP is just been adopted by the university in 2010, it was optional to be used for teaching, and it was made compulsory in 2016 after the university have realized that most lecturers do not use it up to its maximum potential to promote student success. Thus, I started using it in 2016 and my main focus was only to display Biology module content (human anatomy) using my desktop computer having a logon function for password…I found it challenging to engage student on Moodle platform… I prefer using giving lectures in the lecture hall (face-to-face) since I can easily reach my targets (objectives)'.* Further to this Lecturer 2 further articulated that, *'I am not use to this Moodle LMP…I always consult Moodle training guide on how to use Moodle activities to teach laws of momentum in Physical Sciences (mechanics)… I was using Moodle quiz and assignment activities driven by the content uploaded on Moodle LMP, and quiz activities was done on weekly basis…'.* Whereas, Lecturer 3 stated, *'I only uploaded the content that is going to be assessed during examination including the scope, and also instruct student to download those readings. For instance, I normally upload content on Algebra (various ways of solving for x in a given equation which will be asked during examination)… I accommodate all of kind of student using different transport mode to come early to attend my lecture to avoid disturbance (lecturer controls teaching)'*

Theme2: Informal Moodle Curriculum

Informal Moodle curriculum places the student at the center of teaching and learning process (social constructivism) (Khoza, 2017). Remember that informal Moodle curriculum is also termed as competence (integrated or horizontal) curriculum having its own signals (Learning outcomes, software resources, online platform, assessment as learning, financial permission, character as facilitator, student-centred activities, daily programmes, and science module content) (Bernstein, 1999; Hoadley & Jansen, 2013). Note that only one lecturer reflected in this theme since all others were not familiar with the use of Moodle LMP.

The all other two lecturers remained silent, but Lecturer 3 reflected that, *'It is interesting to use Moodle platform because my teaching of science content like chemical change in chemistry is made easy, controlled and led by students during discussion in Moodle forum activity…Moodle helps me to track the percentage of each student participation… online platform makes teaching simpler to me since it allows to me upload videos about a certain science content for students to construct their own understanding in order to achieve learning outcomes(social constructivism)….I find it appropriate that only registered student can have access to Moodle LPM and can receive any massages (announcement activity)…the*

university made it easy to provides each students with Wi-Fi (wireless fidelity) so that it can be easy to access internet for Moodle LMP to download slides….workshop Moodle activity was used to engage student to assess each other before they can sit for any other assessment task…Moodle LMP platform allows me to accommodate all kind of students abilities in learning because I am able to upload science module content using any file format such as PDF, MS word, PowerPoint, Videos and others facilitated on daily basis…I was happy to notice that alignment of learning outcomes with the science content helped my student to pass with flying colours in my module…I allow students actively engage in all module activities on daily basis for holistically development '.

Discussions of findings

The findings appear to suggest that Moodle LMP provides both informal and formal Moodle curriculum with its signals addressing the module need and student need/success respectively (Hoadley & Jansen, 2013). However, from the findings the majority of the lectures appear to be well grounded on formal Moodle curriculum (traditional teaching) which is lecturer-centred and driven by the science content during teaching and learning. The teaching of science modules in this curriculum is driven by formal Moodle curriculum signals (Objectives, hardware resources, face-to-face platform, and assessment of learning, physical permission, character as an assessor, content-centred activities, weekly programmes, and science module content) (Berkvens et al., 2014; Bernstein, 1999). This suggests that lecturers are basically focusing on the teaching/delivering of the prescribed science module content from the module outlines, books and other readings. The taught content influences the assessment of learning, and lecturers were employing face-to-face platform rather than the online platform so that they can have control of all teaching and learning activities (Khoza, 2017). Moreover, the informal Moodle curriculum seems to drive lecturers to deliver the content using Moodle without engaging students to unpack the content for their success in Higher education.

On the contrary, Moodle LMP is designed for social constructivism where lecturers should provide a platform for students to interact, engage, participate, and share ideas/opinions about the module content being studied (Jackson, 2017). This Moodle LMP provides informal Moodle curriculum with its horizontal signals (Learning outcomes, software resources, online platform, and assessment as learning, financial permission, character as facilitator, student-centred activities, daily programs, and science module content) (Hoadley & Jansen, 2013). However, only one lecturer lamented on the proper impact of informal Moodle curriculum by addressing all these signals in order to engage students in unpacking the science module content in order to attain student success. Findings from this curriculum indicates that using Moodle LMP to unpack the content helps students to succeed because their needs are prioritised so that they can excel in their academic progress. Be that as it may, it is still clear from the findings that most lecturers can hardly use emerging LMP which is aimed at

addressing student success in HEIs, and one of the reasons is the issue of digital immigrants (lectures) versus digital natives (students). In other words, lecturers needs training before the use of Moodle LMP, whereas student are able to engage with Moodle LMP without any training rendered. Therefore, the literature indicated that any problems faced by lectures in education (reluctance to embrace and balance Moodle curricula), can be solved by the process of reflection (reflection in and on action). This suggests that lecturers can used reflection-on action which address the formal Moodle curriculum and reflection-in-action which address informal Moodle curriculum to balance the two curricula for student success. In other words, the use of Moodle LMP in teaching science seek lecturers to intertwine the use of both Moodle formal and informal curriculum because they seem to unpack the content of modules while addressing the social needs of students. This suggests that lecturers should reflect on their teaching and learning practices in order to master and align both formal and informal Moodle curriculum signal in order to attain student success.

Conclusions and educational implications

This study concludes that lecturers should use reflection-on-action and reflection-in-action to master and align Moodle informal with formal curriculum respectively in order to attain student access in terms of graduation rates, retention, and time to degree completion, postgraduates' degree completion, job placement, and other measures. Alignment of these two Moodle curricula includes lecturers having the best science content knowledge and adequate computer skills to integrate content with Moodle LMP to serve the purpose of social constructivism pedagogy in HEI for student success. Thus, reflection-on-action and reflection-in-action of Moodle is a common intervention in addressing all challenges facing the HEIs with its policies on the use of emerging LMP such as Moodle. The findings further conclude that the lectures' usage of Moodle LMP in teaching science modules was driven by formal Moodle curriculum more than informal Moodle curriculum. This study consequently recommends the use of reflection-on-action and reflection-in-action to align these two Moodle curricula for easy attainment of student success in higher education.

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VIDEO CONFERENCING AS A STUDENT SUPPORT STRATEGY IN DISTANCE EDUCATION: THE CASE OF UNISA ADULT EDUCATION PROGRAMME

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Abstract
Student support forms an integral part of distance learning in many higher institutions. It provides students with the necessary supports to enable them to complete their education programmes on time. The programme is delivered through the ODL mode, which poses challenges to many students. More so, worldwide, video conferencing has become one of the most common student support strategies in ODL. However, students' experiences in the use of this strategy in an ODL institutions in South Africa, still remains to be established. Thus, this paper investigated students' experiences of video conferencing as a support strategy in ODL institution of higher learning. A qualitative and exploratory research approach was used in this study. Focus groups and interviews were specifically used for data collection. The findings reflect positive experiences of support from lecturers using video conferencing. There were, however, some weaknesses in the strategy delivery such as the logistics and poor attendance of students due to lack of adaptation to innovation in teaching and learning. Based on the findings, recommendations were made on how to improve video conferencing as a support service or strategy for students studying at ODL institutions.

Keywords: Video conferencing, teaching, learning, student support, strategy, distance education

INTRODUCTION

ODL is becoming a worldwide mode of learning in higher institution of education. However, its effectiveness requires the use of several students' support strategies. Apparently, video conferencing seems to be the student support strategy of option globally. The African Virtual University (AVU)–Kenya, Nairobi indicates that, the learners interact with tutors and other students mainly via the videoconference (VC) technology with the augmentation of e-mail. The University reports that there is significantly increase access to quality higher education and training through the innovative use of video conference (AVU annual report, 2011:3). At the University of Windsor (UWINDSOR) in Canada, VC offers a level of interaction among distant students and groups that is often necessary but not easily available through other mode. Although established as a residential university, VC at this university is available to the university community at no charge during regular business hours. At this university, VC technology plays an important role in establishing and enriching the academic, community, and professional networks involved in the teaching, learning, research, and administrative mission of the University (UWINDSOR, 2010).

The National Library of Medicine (NLM) in 2004, explored how videoconferencing and synchronous collaboration technologies, especially those using internet protocols (IPs), might be employed for distance education, either alone or in conjunction with other approaches.

Given the ubiquity of the Internet, IP videoconferencing technologies have the potential to reach more locations at lower costs than alternatives requiring the lease of land lines or satellite time. In addition, creating real-time learning experiences can be less costly and time consuming than developing self-instructional tutorials.

The above-mentioned institutions are merely examples of many users of VC around the world. Though there are several articles that touch on VC, such as 'Social communication networks and videoconferencing: Strategic management decisions in new organizational forms – the case study of Tertiary Education Linkages Project (TELP),' authored by Saunderson and De Wet (2005). 'Using videoconferencing to teach Nursing Management' based on a study conducted in KwaZulu-Natal by McInerney and Nkosi (2007) and, 'The use of synchronous videoconferenceng teaching to increase access to specialist nurse education in rural KwaZulu-Natal, South Africa' authored by Chipps (2010). Apparently, these studies focused mainly on nurses' perception of benefits and preferences for videoconferencing, nursing management, and expertise of tutors but none of these studies investigates ABET students' experiences of VC in ODL; how they experience video conferencing as support strategy in ODL?

No doubt, the above authors should be commended for their efforts, but one cannot help noticing the glaring gaps prevalent in all of these studies; other equally important aspects such as ABET students' experiences of VC in ODL; how they experience video conferencing as support strategy in ODL is overlooked. Therefore, based on the above literature review, I attempt to fill that gap because there is need for more research possibilities in the area of ABET students' experience and videoconferencing for teaching and learning to take place effectively.

VC is generally known as a two-way synchronous communication of sound and vision, the technology represents a powerful instrument for gathering people who are located in different geographical places, and it enables their communication in real time, including audio and visual connection (www.activecitizen.net). It is not the world's latest "hot" technology, according to Lawyer-Brook and McVey (2000) but it is the principle of synchronous online communication, which illustrates how active learning and community building happen through a videoconferencing system. Neuman (2003) reported that a technology used during the process of videoconferencing is called videoconference (VC).

Simply put, VC is the synchronous two-way connection of two or more locations through audio and video equipment that allows people in different locations to see and talk to each other. It may also support the electronic exchange of files, sharing of computer applications and co-working. Many ODL institutions are using videoconferencing as a method of extending their classrooms to students at different locations. Of all the distance teaching technologies, videoconferencing is the most similar to classroom instruction.

RESEARCH QUESTION

This study explored students' experiences in the use of video conferencing as support strategy in ODL. Hence, the addressed the question: how do student experience video conferencing as support strategy in ODL?

THEORETICAL FRAMEWORK

There are several potential emerging theoretical frameworks of ODL that are considered effective, one that has attracted a lot of attention is the Community of Inquiry (CoI) framework developed by Garrison, Anderson and Archer (2000). One of the elements of the framework, according to Gunawardena and Zittle (1997) is described as the ability of learners to project themselves socially and emotionally, who then are regarded as real people in mediated communication. To add to this notion, higher education has consistently viewed community as essential to support collaborative learning and discourse associated with higher levels of learning (Garrison & Arbaugh, 2007). Equally so, a sense of community can also be created through VC technology which incorporates the notion of social engagement of learners. Based on these facts, I argue that in order to offset some of the challenges faced by students in ODL, video conferencing can be used as teaching and learning mode to enable students to learn and be aware of what lies ahead.

The CoI framework is social constructivist in nature and grounded in John Dewey's (1938) notion of practical inquiry (Swan & Ice, 2010). In applying a community of inquiry framework in this study, my argument is that the Adult Basic Education and Training (ABET) students' experience video conferencing as support strategy in ODL investigated, and for this reason, interactivity should be central to this process. I see interactivity as an extension of the community of inquiry (CoI). This from an educational context, could be modelled by a group of students who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding. This sense of isolation according to Song, Singleton, Hill & Koh, (2004) has contributed to online learning's high attrition rate, estimated to be higher than that of face-to-face learning

METHODOLOGY

This study used qualitative research methods to investigate ABET students' experiences of VC in ODL; how they experience video conferencing as support strategy in ODL. Participants for the study were selected from a population of ABET students and lecturers of the University of South Africa. Purposive sampling methods were applied in this study to select 14 participants based on specific criteria such as: a minimum of three years' experience in ODL as a lecturer as well as first and second level students were sample from the department. A qualitative explorative (Creswell, 2007) method was employed in finding out what are the experiences of ABET students using VC and how they experience video conferencing as support strategy in ODL. The researcher deemed A qualitative and exploratory research approach the most suitable for the study because of its value in the research of this nature. De Vos et. al. (2005) refers to phenomenology as placing yourself in the participants' shoes to drive the essence of their experiences. Apart from describing the target/sampled group, the use of phenomenological approach enabled the researcher to

understand the participants' personal meanings they might construct from their 'lived experience' (Johnson & Christenson, 2000).

To ensure good reliability and validity though, qualitative research approach was used during data collection, being interviews whilst interviews better suited the need to find out more from the participants themselves, two interviews were conducted; one with the students and the other with the lecturers. In this study, I used purposeful sampling to select participants (lecturers and students) because of their exposure to or experience of the phenomenon under study (Ryan et al., 2007). Only one focus group interview was conducted using five participants (VC students) from UNISA.

The participants were self-selected by virtue of their position as lecturers and students at the institution "experiencing the phenomenon under investigation" (Giorgi in Van der Mescht, 2004:5). A request for an interview was emailed to three lecturers at ABETS who employ video conferencing as part of their support, to find out to what extent video conferencing assisted their teaching and learning, if at all. All three lecturers have been using VC for longer than 12 months, and it was deemed that they could provide an authoritative view on the experience of video conferencing on their teaching and learning, from ODL perspective. All three lecturers have both taught at a regular and distance institutions of higher learning. The six students selected have also studied both at regular and distance institutions.

The questions put to lecturers were not formally structured as all three interviewees knew the interviewer, and subsequently the interview was characterized by a more open conversation. They were however asked in particular about the advantages they thought they were getting from using video conferencing as part of their support strategy in ABET, and if any, if and how this translated into throughput. The use of open-response questions enabled me to engage in an in-debt probing (McMillan & Schumacher, 2006) following-up specifically appealing data that emerge in the interview and participants are able to give a fuller picture of their reality (De Vos, 2005).

DATA ANALYSIS

Data analysis was done using thematic analysis which entails the procedure of identifying patterns or themes within qualitative data (Braun & Clarke 2006). An inductive approach was followed where data was analysed by using the particular information gathered to construct themes (Creswell, 2009). Comparisons were drawn, similarities identified and a discussion of the research presented. After thorough reading through the mentioned text, the researcher organized the data and discovered the relationships or patterns through scrutiny of the data. Thereafter, the researcher made use of open coding methods and identified sub-categories that emerged from the texts under each theme and coded these according to the topics and sub-topics.

VALIDITY/RELIABILITY OF INSTRUMENT

It is essential that any tool used in a research study be both valid and reliable. This is possible only if the tool measures what it is intended to measure (Salkind, 2003). Most researchers are concerned with the accuracy and trustworthiness of instruments, data and findings in research

(Russell, 2000; Guion, 2002; Bogdan & Biklen, 1992). This is because it make researchers' evaluations more credible and, thus, provides information, which they may defend with confidence. The researcher designed the study to prevent other researchers from replicating the results of the findings. The methodology could be replicated but each context would yield the unique results. To get reliable and valid data in this aspect, the researcher defined his role and tasks that he had to carry out clearly. Interviews were arranged, conducted and directed. Responses from participants were written down. The researcher created conditions suitable for data collection by making the subjects feel at ease so that they could answer questions unhindered. The researcher took notes during the interview session. He wrote down what was said or reported during the interview by the research subjects. He wrote down statements and where possible some direct quotes from the research subjects. Statements and quotes illustrated participant meanings.

FINDINGS & DISCUSSION

In this section, students' experiences of video conferencing as support strategy in ODL are presented. The intention was to find out: - their perception, awareness and the suitability of using video conference in the university particularly in ABET department in relation to their teaching and learning. In addition, it was to see what difficulties student faces while learning through VC and what their perceptions look like concerning VC in ABET.

When asked to comment on the effect VC has had on students' relationships and lecturing in general, it emerged during the interviews that VC has opened up a new dimension of students' communication for Unisa. The participants reveal that lecturers and learner-experience was positive. The group perceived lecturer use of VC as a platform for equipping them to support and actively shape their students' learning and by so doing assisting their University to function in ODL. Teachers could use VC to introduce a task or sets of problems and then allow students to discuss and research to gain an insight or improve their perception of the problem at hand (Gage, Nickson, & Beardon, 2002)

One of the participants, who was supported by others, indicated that:

> *our experienced is that you can spend many hours with a written and verbal interaction, but the moment there is a VC showing how teaching and learning is taking place or about a certain area within Unisa we get tremendous response. You can just reach more than a thousand places further."*

Another participant added:

> *I've been working with students over the years in Unisa and we've always had a fairly good relationship with students until we brought in the use of VC as support strategy for the students and the response after that was great. The trust that was built within minutes between the students and Unisa was unbelievable.*
>
> *We never knew so much about distance education* noted another participant *neither did we get the full picture of Unisa as an ODL until we started attending VC.*

The study revealed that there was consensus about using VC to lecture in order to increased level of throughput.

> *Oh yes definitely. The way we are using VC, shows we are serious with our students, with our students, in our sessions, it shows that we're bringing Unisa to our students in a way that they've never seen us. You know, you never really see the inside workings and all the areas of expertise within the institution by just sitting in front of computer or sending a brochure. Showing all the centres of the institution with VC immediately creates trust because you are re-producing the real things of the institution.*

Other comments were that the lecturers might need VC to get into a student's world, as it is not only a part of their world, but is their language and they will feel heard if it is used as was mentioned by the participants. Three of the participants specifically mentioned the importance of being aware of VC when giving admission to study at the university. These comments serve as illustration:

> *"... it also closes the generation gap", "... we must face it – that's reality to them", and "... you've got to live with the times". This was all said speculatively, as not all in this group had had much experience using VC in the teaching and learning.*

The experience of some of the participants supports this speculation, as some have found that it has indeed been useful in teaching and learning being part of the support strategy provided by the university.

The findings from the study are confirmed by those from the literature which highlighted the roles that VC as a student support strategy in distance education play in establishing and enriching the academic, community, and professional networks involved in the teaching, learning, research, and administrative mission of the University (UWINDSOR, 2010:3).

> *VC facilities in tnisa are adequate and well maintained especially at the Pretoria campuses. Overcrowding is not a problem as several rooms are linked to the VC facilities.*

This confirms that class size and structure are not a problem to learners attending video conferencing. One of the participant thus remarked:

> *The classes use for VC are well felted and secured with the facilities well in place. We don't have to queue for minutes at the toilets.*

The findings from the study also revealed that the VC mode was prefer to the face-to-face by participants in teaching and learning. As noted by one of the participant. Geographically it does differ, but we find in the larger centres with fast learners, our students know a lot more

about our department and institution than we thought, and that information definitely comes from the VC.

> *We have seen the impact of VC in teaching and learning compare to a face-to-face basis, so we've decided to use VC to teach in ABET.*

However, the findings from the study revealed that some of the lecturers in the department do not have the necessary techniques or structures in teaching and learning using VC. In most cases top-down approaches were adopted. This approach never gave learners the opportunity to express their views in issues that concern their learning. This implies that there are still some lecturers who are still using the traditional way of teaching. This make those lecturers' teaching passive among learners. All the interviewed students indicated lecturers' personality, interactivity, and teaching style were more important than point of origin. They singled out the VC session on one of the modules because the lecturer frequently asked questions and specifically used what they know as a context for discussing what they don't know (the subject). All the students felt that lecturers could be more engaging and interactive and that having hands-on experience was needed in sessions related to using VC. In support of this finding, another participant shared the following:

> *My personal thoughts are that the impact of VC totally amazed me, that in a very short space of time you can reach so much students with information and have such a major impact on them sitting in front of you. I am surprised. I didn't think that the impact would be so big, so yes, it would be a continuous tool for us in the future. We encourage our colleagues never go teaching without VC.*
>
> *I think a VC is a way of cheating a face-to-face teaching. You're reaching volumes, and that's what it is all about. Because at the end of the day, if you want an increase in the throughput, depending on student's location and where they are, you will have to change the old way of doing things because of perception. So how can you not have the perception of ABET out there by having something that is specific and exactly in line with what ABET's perception is.VC gave us the opportunity to standardize teaching and make sure that it created consistency. And the results are also very consistent when we use VC."*

Also the findings from the study revealed that lack of technical skills in operating the technology was a problem both to the lecturers and the participants. Participants also indicated concerns regarding lecturers' lack of proper teaching styles that could assist them to understand concepts during VC presentations. This they also noted contribute to students' lack of proper learning styles and absenteeism from VC classes. It was evident from various participants' responses that they chose VC over various specific teaching methods medium presumably because of its influences, such as the nature of the technology and the size of the VC venue (crowd).

The study revealed that some lecturers do resort to other methods of teaching when using VC for teaching. They do not apply active methods like small group discussion because they simply are unable to integrate active methods with VC technology. This implies that the rules governing interaction could not be established before a session starts; thereby frustrating participants.

To reduce their frustration levels, participants suggested that reliable equipment needs to be available, which provides good sound quality and is supported by a fast connection. Rules governing interaction should be established before a session starts and finally, an appropriate teaching style is needed to suit the medium; lecturers may need to adjust their teaching style, providing explicit opportunities for discussion, and addressing all audiences. Participants indicated that they would like VC mode of support for teaching and learning in ABET modules and felt that the contents could be covered in greater depth, an indication of the time frame.

CONCLUSION

With reference to the problem statement, the final results strongly suggest that students has positive perception about VC. It has the ability to significantly influence their teaching and learning in the department, to such an extent that it changed perceptions about the institution as a whole and created greater confidence in the department. Nearly all the respondents from the study indicated that they welcome the strategy and that they would use the strategy's services should the need arise. In addition, it should be noted that the positive results were obtained despite few of the participants came into the research with a negative opinion about the institution in which the department operated. The researcher argues that in order to offset the many challenges faced by students in Unisa adult education; video conferencing can be use as teaching and learning mechanism to enable students to learn and be aware of what lies ahead. From this perspective, it would appear as though VC has the ability to affect emotions during the initial encounter with the institution, which in turn affect the formation of seriousness, to such an extent that it appears to increase throughput.

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CHALLENGES IN PROMOTING HEALTHY AND SAFE SCHOOL ENVIRONMENTS: A CASE STUDY OF SELECTED SCHOOLS IN THE EASTERN CAPE

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Abstract
This paper focuses on school governance and its challenges in promoting healthy and safe school environments in selected schools in the East London and Butterworth Educational district of the Eastern Cape. It is contrasted with the Integrated School Health Policy (ISHP), instituted across all South African Provinces, with specific focus on spatial density and sanitation. The objective was to ascertain whether schools were overcrowded, and if so, what the causes were, and whether schools had sanitation to cater for learners. The study was guided by the Health Promoting School, and the Socio–Ecological Frameworks, underpinned by the Whole School Development Framework. An in-depth literature review, focusing on the implementation of policies associated with health and safety was also done. The research was conducted at 6 schools: 3 schools in the Butterworth Educational District and 3 schools in the East London Educational District, as well as the district office in each of these two Educational Districts of the Eastern Cape. The design was a case study, and a qualitative methodology was used. The sample consisted of 3 members from each of the school governing bodies, that is, the principal, one other member of the school governing body and a member of the school management team at schools. 1 (one) official from each Educational district, also formed part of the sample. A non-probability, purposive sampling method was used. The instrument was semi-structured interviews. Various contributing factors were identified, such as the non – implementation of policies, the non - support from the DBE for schools and district officials, lack of infrastructure, lack of human and other resources, and vandalism amongst other. It is concluded that the DBE is capsizing its own objectives of ensuring healthy and safe school environments, due to lack of support in terms of adequate finance, infrastructure, lack of human and other resources. The DBE should reassess its support to schools and district officials.

INTRODUCTION/BACKGROUND

In South Africa (SA), many children suffer from ill health which is environmental related (Mathee, 2011). As a member of the World Health Organisation (WHO) and having pledged to put children first, the SA government has issued the Integrate School Health Programme (ISHP) at schools across all provinces in 2010. It has clearly specified implementation guidelines. A specific objective of the ISHP is to support the school community in creating a healthy and safe school environment for teaching and learning. In addition, schools are guided by their own school health policies to ensure the promotion of healthy and safe school environments.

Even so, many schools in the Butterworth and East London educational districts are characterised by disorderly school environments, inside and outside the school yards, broken windows, overcrowded classrooms and more, as reported in the media (Carlisle, 2014, Macgregor, 2014, Linden, 2014, Ntshobane and Majangaza, 2014). These conditions can have serious health and safety implications for all members of the school environment

(including learners and educators). It can lead to a host of illnesses and diseases, such as asthma amongst others (Mudarri, 2010). It can also be contributing factors that affects the psychosocial life of individuals through depression, despair and so on, and can result in consequences such as violence, bullying, substance use, and lack of academic achievement amongst others (Jamal*et al*., 2013). It is thus necessary to investigate the status quo, to understand why schools are in these conditions, with specific focus on spatial density and sanitation, since ISHP implementation guidelines have been provided. Schools are also governed by school health policies to ensure that school environments are healthy and safe.

PROBLEM STATEMENT

An unkempt school environment clearly indicates that there is a gap between policy and implementation (University of Western Cape (UWC), 2006;Waggie, Laattoe and Filies, 2013, World Health Organisation (WHO,) 2013), which is not only a national, but also an international problem. An occupational school health and safety audit completed by the Victorian Auditor- General's Report (2013) in Australia, for example, also found this gap between policy and implementation. This audit further found that few schools achieved full compliance and many needed considerable improvement to do so.

The ISHP has indicated roles and responsibilities for the implementation thereof for all the role players, such as at national level, necessary resources for implementation must be ensured amongst other duties. At provincial level, the key role is to secure the required financial, material and human resources and monitor implementation in the province; and at district level, amongst other duties, they must ensure progressive coverage of all schools and learners, starting with the most disadvantaged schools; down to SGB and their duties (ISHP, 2010). It is important to investigate whether there are challenges in providing a healthy and safe school environment, focusing specifically on spatial density and sanitation. Although well researched (Evans, 2006, Higgins, Hall, Wall, Woolner and McCaughey 2005), these conditions have serious long term health and safety consequences that urgently need to be corrected.

RESEARCH QUESTION

What challenges do school governance experience in providing healthy and safe school environments?

SUB QUESTIONS

- Do schools implement school health policies and programmes?
- How does school governance address spatial density?
- How does school governance address sanitation?

OBJECTIVES

- To understand what challenges school governance experience in providing healthy and safe school environments.
- To determine how school governance address spatial density.
- To establish how school governance address sanitation.

THEORETICAL FRAMEWORK

The theoretical framework for this study is a Health Promoting Schools and a Socio-ecological frameworks, underpinned by a Whole School approach.

HEALTH PROMOTING SCHOOLS FRAMEWORK

The Health-promoting Schools (HPS) framework provides a model for partnership working between health services, local authorities and schools. It is a multifaceted approach which endeavours to form supportive physical and psychosocial school environments that promote learners' ability to make healthy choices and to develop positive attitudes and relationships through life skills and to build links with the community (Tjomsland, Larsen, Viig, and Wold, 2009).

THE SOCIO- ECOLOGICAL FRAMEWORK

Briefly, the socio-ecological (S.E) framework assists to explicate factors which have superior organisations for health and health behaviour. It provides inclusive frameworks for understanding multiple and interacting determinants of health. Behaviour change is capitalized on when environments and policies support health (Jung-A, Jong, Myung, 2015).

WHOLE SCHOOL DEVELOPMENT APPROACH

The Whole School Development Approach focuses on creating change in a holistic manner of the entire school environment, learners, educators and all role players in the life of the school. It includes the surrounding physical school environment, as well as the psychosocial elements of ethos and school climate (Steward-Brown, 2006; Vreeman and Carroll, 2007, World Health Organisation, 2012).

LITERATURE REVIEW

There is no task more important than safeguarding the environment of children (World Health Organisation (WHO) (1960). Healthy Environments for Children Alliance (HECA) (2002) focuses attention on the school environment as one of the key settings for promoting children's environmental health, because good health is a prerequisite for education. Education is important for future employment opportunities and also increases one's knowledge, which in turn can improve health (Baum, 1994). Educational departments across the world have issued guidelines to schools to ensure healthy and safe school environments, South Africa not being the least of them. Schools generally are guided by health and safety policies which are executed by amongst others, the School Governing Body (SGB) (Parret and Budge, 2012). However, it is the principal who must ensure that staff implements these policies. In South Africa, it is a prime responsibility of the principal to ensure that a safe, nurturing and supportive environment is created that facilitates effective teaching and learning. (Department of Education (DoE), 2012).

Although the ISHP has been structured to ensure successful implementation, and although many challenges related to the previous school health programme, (such as poorly

constructed relationships among key policy actors, absence of policy translation process, resulting in insufficient capacity and resources among others)had been addressed in the ISHP of 2012 (Shung- King 2013), it is not without criticism. Mohamed, Struthers and Sanders (2013), criticize the ISHP by stating that it is not comprehensive. The authors opine that it has very little emphasis on health promotion beyond health education, and that implementation would require major financial and human resources. A further concern according to the authors is how schools and public health carers would manage the extra workload and human resources that are required to support school health.

Furthermore, many implementation challenges found by a study of the University of Western Cape (2006) that evaluated implementation of the ISHP, still exists. This was also found in a study in the Mpumalanga and Gauteng Provinces by Mohlabi, Van Aswegen and Mokoena (2010). Their findings are corroborated by Waggie, Laattoe and Filies, (2013). These challenges though, are not only experienced in South Africa. Basch (2011), for example, found that school health has also not yet been fully integrated in schools in America, and Hunt, Barrios, Telljohann and Mazyck (2015) who reviewed the literature on the whole school approach to school health policies, processes and practices, state that although literature suggests potential benefits, many common challenges are experienced, such as lack of clear leadership, administrative support, clear messages and communication channels to increase understanding and co-operation from school staff and the community, lack of funding resources and engagement by community health partners, which have to be addressed for implementation of policies and programmes to be successful. These are also some of Waggie*et al*.'s (2013) findings.

Literature on school governing bodies further indicate that many school governors lacked the skills necessary to execute their functions effectively, since these functions required specialist knowledge and skills (Xaba,2011; Xaba and Ngubane, 2010; Chaka, 2008). Even so, schools should do all they can to ensure health and safety of all on the school premises.

OVERCROWDED CLASSROOMS

An important element in the school environment is that of spatial density. Classes that do not take spatial density into consideration, and is overcrowded, have many negative consequences. Overcrowded classes could lead to physical health problems (WHO, 2012). Density leads to indoor pollution which has been linked to respiratory infections in children, and chronic illness such as bronchitis. It leads to increased aggression, hostility, movement and distraction (Allen and Hessick, 2011). Furthermore, it results in decreased social interactions, as well as lower academic achievement (Tanner, 2008); infectious diseases such as influenza spread more rapidly in schools than in other buildings, (Mudarri, 2010), making overcrowded classrooms very dangerous in terms of health, since it can lead to many long term health and safety consequences. The Victoria Institute of Teaching (undated) additionally claims that schools and classrooms can attain an emotional significance, and that space can be conceptualised as being an interaction between physical and social spaces.

Citing McGregor (2004), the author states that space is created by the social aspects and that it can indicate to learners about adult expectations and power structures.

Classrooms, therefore should allow learners plenty of space, according to Reggio Emilia (in Allen and Hessick, 2011).Classrooms that take space into consideration therefore, not only ensures good health and safety for learners, but will also curb disruptive behaviour (Allen and Hessick, 2011).

In South Africa, studies have focused on the negative consequences of overcrowded classes on academic achievement. According to Khumalo and Mji (2014), overcrowded classrooms are unsupportive learning environments. Bayat, Louw and Rena (2014), who investigated the confluence of factors impacting on underperformance at secondary schools in the Western Cape, concur. They recommend that the DBE decrease the teacher to learner ratio to 1 to 25 for academic achievement to be obtained. It also obstructs classroom management and discipline (Mustafa *et al.*, (2014), cited in Marais (2016). Furthermore, educators cannot pay attention to all the learners according to Kiggundu and Nayimuli, (2009), amongst others. Overcrowded classes therefore are detrimental to the health of learners and educators, as well as to learners' academic achievement.

SANITATION

Sanitation is equally important. According to UNICEF (1998) there exists a high prevalence of water and sanitation-related diseases, which causes many people, and especially children to fall ill and even die. A systematic literature review by Jasper, Le and Bartram (2012), of forty-one peer- reviewed articles and documents, concluded that studies showed higher rates of infectious, gastrointestinal, neuro-cognitive and psychological illnesses where learners were exposed to inadequate water and sanitation facilities. Such facilities were also the cause of increased absenteeism from schools in developing countries during menses. Their findings also reported a decrease in diarrheal and gastrointestinal diseases with increased access to adequate sanitation facilities in schools. It was also clear from the findings that safe drinking water and hygienic toilets that offer privacy to users had great potential to beneficially impact children's health.

Guidelines of Child- Friendly Schools (2006), therefore suggests that educators should work together with learners to prepare and carry out a plan for monitoring and keeping up facilities and helping learners to stay clean and healthy. Since many children in the research area hail from informal settlements, teaching children for example to wash their hands after using the bathroom facilities could greatly assist in health promotion.

METHODOLOGY

This study was undertaken in the qualitative interpretive paradigm, as it enabled the researcher to understand what challenges school governance experienced in promoting healthy and safe school environments with the focus on spatial density and sanitation.

RESEARCH DESIGN (CASE STUDY)

A case study research design was used. A case study's general objective is to develop as full an understanding of that case as possible (Silverman, 2013). It allowed the researcher to discover, for example how, and why things were as they were.

SAMPLE SELECTION

The researcher purposively selected three (3) schools in the townships of East London Educational District, and 3 urban-based schools in the Butterworth Educational District that reflected unkempt school environments, and the district office in each educational district.

SELECTION OF PARTICIPANTS

In each of the schools, the principal and one other member each of the school governing body (SGB), as well as a member of the school management team (SMT) were interviewed, since they govern the schools. 1 relevant district official in each Educational District was also interviewed, since they are tasked with providing support for the schools. Thus participants in the research study totalled twenty (20) people.

DATA COLLECTION STRATEGIES

Semi- structured, open –ended interviews were used (Maree *et al.*, 2010) to ensure that interviewees responded to the same central questions, allowing them to explain and qualify their responses (Leedy & Omrod, 2010).

DATA ANALYSIS

The researcher throughout the data process, read, organised, reduced and described the data, reflecting on similarities, differences, categories, themes and ideas, grouping it to see what patterns emerged as advised by (Henning *et al.*, 2004).

TRUSTWORTHINESS AND CREDIBILITY

To guarantee trustworthiness multiple methods of data collection was used. Three different members of the school governing body were interviewed and photographs were taken to ensure credibility. To gain a holistic view, district official in both Educational Districts were also interviewed. Interview questions were standardized by the Research Champion at Walter Sisulu University before being submitted to the supervisor. An electronic recording devise ensured that responses were those of the participants.

ETHICAL CONSIDERATIONS

All ethical principles were observed by firstly seeking permission from the Research and Ethics Committee of the University of Fort Hare. Permission was then sought from the Provincial Educational Department of the Eastern Cape.

PROTECTION FROM HARM

The information was kept strictly confidential by, for example, labelling each school in the East London educational district as school 1, 2 and 3 EL, to indicate the educational district, and the same in the Butterworth educational district. Principals were likewise labelled for instance as participant 1, 2 and 3. All audio recordings were treated in the same way and kept safely. Participants were informed of their rights, including that participation was voluntary and all signed informed consent forms. They were also ensured of their anonymity and were supplied with the researcher's contact details in case of queries.

FINDINGS

SPATIAL DENSITY (OVERCROWDED CLASSROOMS)

In response to how schools addressed spatial density, participants at all the schools indicated that this was a difficult task, and admitted that their schools were very overcrowded. At one school they were in excess of 600 learners above capacity. Attempts at some schools were made to address the over crowdedness of classes, by converting offices into classrooms, and at one school, a section of the library was converted into a classroom. Overcrowded classrooms is not only unhealthy, it is also very unsafe. As literature reflects, it leads to a host of physical health problems such as respiratory infections in children, and chronic illness such as bronchitis (WHO, 2012). It also leads to increased aggression, hostility, movement and distraction (Allen and Hessick, 2011), amongst others.

Lack of infrastructure is a challenge that contributed to the problem. In this regard, participants indicated that they do not get any active responses from the Department of Basic Education (DBE) to their request for more classrooms. Data from the district officials concur, and they state that the provision of infrastructure was a long process, since many role players such as architects and construction companies were involved that operated according to their own timeframes. This indicates a lack of clear planning, as companies should state when the task would be complete. Districts officials further stated that the funds that they received for infrastructure was also not sufficient to cater for the demand. The lack of infrastructure puts a strain on already strained existing ones, exacerbating problems in terms of health and safety

New housing developments in the researched area was also raised as a challenge, since these did not make provision for schools, so that there is an influx of applications to the schools which they cannot refuse, because parents became militant and rioted if their children were not admitted. This indicates that there is no comprehensive planning on the government side, which makes it difficult for parents and schools. It should be considered that these schools cater to the under-privileged communities, who are often not employed. Parents cannot send their children to schools that may be less congested, but further away from their places of residence. Though parents may have their children in school, the overcrowded conditions have repercussions, not only in terms of the learners' and educators' physical, but also their psychosocial health (Jamal *et al*., 2013).

The DBE redeployment and retrenchment of educators also adds to the challenges, because its policy on the number of learners at a school is dogmatic, and leaves schools without

educators, especially at high schools where learners followed different streams of subjects. This creates overcrowded conditions in classes, since learners are crammed into one class. At one school 96 learners were placed together in a class created to accommodate 40 learners, because of educator shortage. At another school, there were no chairs in the staffroom. The fact that the DBE is perceived as not responding to request for more infrastructure leaves staff feeling abandoned, and unappreciated, as, for example, at one school, there was not even a chair in the staffroom. Learners themselves cannot feel happy, since as for example, as reported by a participant, at one school learners had to stand and write their words, since there was a shortage of furniture in the class. This encourages disruptiveness in class (Allen and Hessick, 2010), and could lead to despair (Jamal *et al*. 2013).

SANITATION

FINDINGS

The findings overwhelmingly indicate that the schools under investigation are seriously challenged with regard to sanitation. These challenges are caused by the overcrowded schools, collapsed fences, vandalism, lack of finances, security guards and human resources.

DISCUSSION

Sanitation at the schools investigated is of a very poor standard and not as to be expected in terms of Policy. As pointed out in the literature, this is very unhealthy, (UNICEFF, 1998; Jasper, Le and Bartram, 2012). Over crowdedness at schools have a direct impact on the sanitation facilities, since schools do not have the necessary infrastructure to cater for the large number of learners. The collapsed fences, which are a result of community members cutting the fences and carrying it away to their homes, as well as criminals who break into the schools to rob them of any metal that they can find, exacerbate the sanitation challenges, since they rip out copper and metal piping, which is costly, because pipes have to be replaced. Often vandals just break the toilets and doors for no apparent reason, according to a district official participant. This scenario indicates that the health and safety of all on the school premises are being seriously compromised.

Schools do not have adequate security guards, since the DBE has placed a moratorium over the past ten years on the employment of security, and do not replace those who resign or retire, leaving the school open to criminals, which is dangerous for only two security guards. At one school in the area, the security guard was stabbed to death. According to one of the respondents, the security that are employed, (and often are not trained), fear for their lives. In terms of cleaners for the toilets, at all the schools, SGB only employed two people, and when the researcher perused the toilets at one of the schools, the stench of the toilets were unbearable, indicating that they were either not cleaned properly, or lacked detergents. Financial constraints to do repairs, was also a big challenge, since most of the people in the area are unemployed, and cannot support the fundraising efforts.

However, it should be said from the responses of interviewees, that at least 2 of the 6 (33, 3%) schools investigated, are making an extra effort to inculcate good sanitation habits in learners. At these schools, basins with water and soap are supplied for learners to wash their hands before eating, and after they have visited the toilet. One should also appreciate that the SGB of the various schools are working at employing people to keep the toilets clean. Data further indicate that SGB work tirelessly to repair broken toilets. Two of the schools also indicated that they were getting support from non-governmental detergent companies. However, even so, sanitation at these schools is definitely a health hazard.

The water crises caused by the drought in the Butterworth educational district should also not be used as an excuse for poor sanitation. It is still a health hazard, and indicates lack of strong management, because good management would have ensured that schools do have a backup system for such unforeseen eventualities as drought. The fact that learners just relieved themselves anywhere because of the lack of adequate toilet facilities, as indicated at one school, is very bad, as this could further spread germs. It is also condoning what learners were doing, because those in authority did not make adequate provision for this eventuality. Learners could get into the bad habit of relieving themselves just anywhere as is often witnessed in the community, putting the health of the whole community at risk. Schools are the places where, if learners are taught good sanitation habits, these habits could spread into the community.

CONCLUSION AND RECOMMENDATIONS

The objective of the study was to investigate what challenges school governance had in promoting healthy and safe school environments, and to ascertain how spatial density and sanitations were addressed at these schools.

The data indicates that the schools generally are inundated with challenges. Although they have the ISHP guidelines, three (3) of the six (6) schools investigated, did not have school health policies. There seems to be a breakdown amongst the key role players, either at provincial or national level. District officials who must ensure implementation of policies and programmes and give support to schools, are experiencing a shortage of human and other resources. These are to be provided by the provincial department. This constrains the service of the district officials, since one official has to service more than 300 hundred schools. This in turn constrains schools who are in turn frustrated, due to a lack of response to their requests for infrastructure, finance, and fencing, amongst others. The placing of a moratorium on the supply of security of the school for instance, also does not indicate seriousness in providing healthy and safe school environments, leading to the perception that the Department of Education does not address these matters.

It is clear that there is a need for clearer planning when communities are expanded. In addition to the building of houses, additional schools, and infrastructure; human resources (educators, and ground staff; security) and better fencing, (although to this end it seems as if fencing is being attended to in certain schools), should accompany these developments. Government needs to consider its planning vision and the impact of a lack of facilities on the development and health of children and staff at schools experiencing high spatial densities and poor sanitation. It is recommended that the DBE urgently pays attention to these

elements of the school environment, since they are important not only for physical health, but also for the psychosocial life of all on the school premises. As generally observed in the South African context, policy development does not adequately translate into effective implementation. This is also reflected in this study.

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ADDRESSING TEACHERS' ATTITUDES ON THE IMPLEMENTATION OF INCLUSIVE EDUCATION: A QUANTITATIVE STUDY IN SELECTED HIGH SCHOOLS IN EAST LONDON EDUCATION DISTRICT

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Abstract

This paper focuses on a quantitative study done in selected schools on teachers' attitudes towards the implementation of inclusive education. Despite efforts to ensure quality education for all learners through inclusive education in South Africa, indications are that many learners, especially those who experience barriers to learning, are still excluded from full access to quality and equitable education opportunities in mainstream schools. Research has shown that the success of inclusive education depends upon teachers attitudes. It also shows that attitudes can hinder the progress of the implementation of inclusive education. The paper draws on White Paper 6 which speaks to inclusion of children with disabilities in schools. As the legislative and policy framework for the implementation of inclusive education, White Paper 6 states that "a public school must admit learners and serve their educational requirements without unfairly discriminating in any way". The study is framed by Ajzen's theory of planned behavior, which suggests that an attitude towards behaviour is influenced by past experiences, previous knowledge and newly acquired knowledge. The paper reflects findings from a questionnaire circulated to 75 teachers at three selected high schools, using descriptive statistics to analyse the data. Findings showed that there is no relationship between attitudes based on factors, including class size, years of experience, inadequate resource, lack of adequate training but mainly influences negative on lack of support in implementing. The conclusion is that there is no relationship between attitudes and the factors identified except lack of support. This paper concludes with the recommendations on addressing teachers' attitudes in order to facilitate the inclusion of learners with disabilities in the classroom.

Introduction

Teachers' attitudes on inclusion of learners with disabilities have been found to be a crucial factor that impacts leaners' inclusion (Bender, Vail, & Scott, 1995). In a democratic society, students with disabilities should not be denied access to public education based on their disabilities (Leyser & Tappendof, 2001). It has been reported that teachers with more positive attitudes on inclusion have more confidence in their abilities and commitment to accommodate learners' needs in inclusive settings by adapting appropriate classroom materials and related procedures (Norwich, 1994; Campbell, Gilmore & Cuskelly, 2003). Teachers with more negative attitudes were found to have low expectations for individuals with disabilities (Wilczenski, 1993). Negative attitudes about children, learning, and schooling are likely to interfere with the teachers' support for and effective participation in inclusive settings (Brantlinger, 1996). The study focusses on addressing issue that causes these negative attitudes. It is also trying to find amicable ways of addressing attitudinal change in mainstream education.

Children with special educational needs are progressively being taught in mainstream schools throughout the world (National Council for Special Education, 2006). Research has shown that the success of inclusive education depends upon teachers' attitudes (Alghazo & Naggar Gaad, 2011). It is imperative to examine teachers' attitude towards the inclusion of learners with learning difficulties into regular classrooms. Many countries both developed and developing have adopted a policy of inclusive education/mainstreaming in their education policies. Nigeria, for example adopted the policy of mainstreaming in the National Policy of Education (1998). The Policy stipulates the integration of special needs learners into regular classrooms (Fakolade, Adeniyi & Tella, 2009). Special education has become central to the educational debates across Europe and the United States of America (Khoaneane & Naong, 2012).

Studies have been conducted to assess general teachers' attitudes towards inclusion and how their opinions affect the successful implementation of the process. According to Avramidis (2000), 'one of the main barriers to the implementation of integrating learners with significant disabilities has been identified as teachers' attitudes. The negative attitudes towards accommodating learners with special needs in mainstream classrooms are consequences of a variety of factors. Avramidis (2000) states regular teachers' attitudes reflect lack of confidence in their own instructional skills and quality of support personnel availability to them. Among others, a limited understanding of the concept disability, negative attitude towards persons with disabilities and a hardened resistance to change is the major barriers impeding inclusive education (Tirussew, 1999). Of particular concern is the fact that teachers' attitudes are seen as the decisive factors for successful inclusion.

The situation is not different in other parts of Africa, for instance South Africa also followed steps in adopting the policy of inclusive education/ mainstreaming in the education policy. Introducing White Paper 6 on Education and Training in a Democratic South Africa (Department of Education, 1995) which provides the framework for the implementation of inclusive education in all public schools (Tshifura, 2012). The South African Schools Act (Department of Education, 1996), states that: "A public school must admit learners and serve their educational requirements without unfairly discriminating in any way". The White Paper on an Integrated National Disability Strategy (Ministry in the office of the Deputy President, 1997). The National Commission on Special Educational Needs and Training and the National Committee on Education Support Services (Department of Education, 1997).

Given the above discussions, this study examined teachers' attitudes towards inclusive education in high schools in the Eastern Cape as part of the White 6 and Policy in South Africa.

Statement of the Problem

Swart, Engelbrecht, Eloff & Pettipher (2002) argued that attitudes play various roles in an individual's life. Harding and Darling (2003), states that teachers' attitudes are important in making any change. Hence, attitudes of teachers are paramount to the successful implementation of inclusive education. In addition, Valeo (2008) reported that the attitudes of teachers are a factor to the success of integrative practices in special education. As it has been argued that attitudes can hinder the progress of the implementation of inclusive education, it is important to look at and understand the factors affecting teachers' attitudes towards the implementation of inclusive education as it is essential in the accomplishment of meaningful transformation in the education system in High Schools.

Purpose of the study

As South African high school teachers' face challenges in implementing the policy on inclusive education, this study aims to unearth the factors affecting attitudes of teachers towards implementing inclusive education.

Objective of the study

To accomplish the above aim, the researcher formulated the following objectives:

Main Objective

- To investigate factors affecting teachers' attitudes towards the implementation of inclusive education.

  Sub- Objectives
  - To examine the effect of the years of experience towards implementation of inclusive education;
  - To examine the effect of inadequate training towards implementation of inclusive education;
  - To examine the inadequate support towards implementation of inclusive education;
  - To examine the effect of class size towards implementation of inclusive education and
  - To examine the effect of inadequate resources towards implementation of inclusive education.

Hypotheses Ho based on Objective

MAIN HYPOTHESES

- There is no significant relationship between factors affecting teachers' attitude and the implementation of inclusive education.

SUB HYPOTHESES

Hypothesis 1

- There is no significant relationship between years of experience and teachers' attitudes towards implementation of inclusive education.

Hypothesis 2

- There is no significant relationship between inadequate training of teachers' attitudes towards implementation of inclusive education.

Hypothesis 3

- There is no significant relationship between inadequate support and teachers' attitudes towards implementation of inclusive education.

Hypothesis 4

- There is no significant relationship between class size and teachers' attitudes towards implementation of inclusive education.

Hypothesis 5

- There is no significant relationship between inadequate resources and teachers' attitudes towards implementation of inclusive education.

Theoretical framework

The theoretical framework that guided this study is Ajzen's theory of planned behaviour (TPB), an extension of the theory of reasoned action (Ajzen, 1991). According to Ajzen (1975), attitude towards behaviour refers to the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour, in question. Assumptions derived from the theory are that theoretical variables of behavioural intention, that is, attitude towards the behaviour, the subjective norm and perceived behaviour control, should come together to estimate intention (Ajzen, 1991). This is a widely used theory to determine behaviour arising from attitudes and has been used in research involving attitudes towards individuals with disabilities. According to this theory attitudes develop reasonably from the beliefs people hold about the object of the attitude. Generally speaking, we form beliefs about an object by associating it with certain attributes that is with other objects, characteristics, or events. In the case of attitudes towards behaviour, each belief links the behaviour to a certain outcome.

Ajzen's theory suggests that attitudes towards behaviour are influenced by past experiences, previous knowledge and newly acquired knowledge (Ajzen, 1991). Attitudes play a significant role in determining behaviour, and it is therefore important to ascertain the factors shaping the attitudes of mainstream teachers as they attempt to include students with disabilities in their classrooms (Rodriguez, 2012).

This study addresses attitudes on inclusive education and uses the theoretical framework to interpret possible influence of past, previous knowledge and newly acquired knowledge. As mainstream of inclusive education is affected by teachers' attitudes, the study focusses on factors that may impact on attitude, including training, support, class size as well as resources.

Review of Literature

Opertti and Brady (2011), point out inclusive education policies worldwide usually focus on two concerns. One is the choice between special education and integration or mainstreaming, as well as the strategies and methods for progressively incorporating students with special needs into regular schools. The second is how to respond to the expectations and needs of targeted excluded groups mostly linked to ethnic, gender, cultural, socio-economic and migrant factors. In other words, it can be seen that an inclusive education policy is developed, firstly, to integrate special and regular education together in a unified education system, whereby the education of children with special needs is supported with appropriate facilities and resources so that they can learn alongside their peers. Secondly, an inclusive education policy is developed to integrate a diversity of learners from varying backgrounds to learn together. Hay and Beyer (2000) pointed out that inclusive education became internationalized in the sense that developed and underdeveloped countries adopted the movement towards inclusion.

The implementation of inclusive education policies has led to an increase in the accessibility of learners with disabilities in South African primary schools (Weedon, Riddell, Fuller, Healey, Kelly, Georgeson & Roberts 2008). However, despite efforts to ensure quality education for all learners through inclusive education in South Africa, indications are that many learners, especially those who experience barriers to learning, are still excluded from

full access to quality and equitable education opportunities in mainstream primary schools (Wevers & Geldenhuys, 2013).

South Africa has developed and successfully implemented inclusive education policies as previously mentioned. Education White Paper 6 provides guiding principles for the education system for South Africa and protects the rights of all people and provides equal access that allows full and equal participation in education to all learners in a single inclusive education system (Wevers & Geldenhuys, 2013).

Teachers form attitudes towards children with disabilities, and ultimately towards inclusion, based on a child's characteristics, the factors in the classroom, and their previous experiences (Leatherman & Niemeyer, 2005). Positive attitudes and beliefs combine to play a major part in supporting diversity in inclusive education (Booth & Ainscow, 2002). Successful inclusion may be dependent first, upon teachers' positive attitudes on the beliefs of disability and second, upon their perceived competence to deliver the lessons. A teacher with negative attitudes toward a learner's ability to learn is very likely to influence how that student is going to feel about his or her learning experience.

Research has suggested that teachers' attitudes might be influenced by a number of factors, which are in many ways, interrelated. These are discussed below.

Years of Experience

A study of Alghazo and Naggar Gaad (2011), showed that teachers with one to five years of teaching experience held significantly more positive attitudes towards the inclusion of learners with special education needs, compared to teachers with six to eleven years of experience and those with twelve or more years of experience. Similar studies were conducted in the United Arab Emirates (UAE) and found teachers with less teaching experience had more accepting attitudes of inclusive trends than their experienced teachers (Alahbabi, 2009; Dukmak, 2013).

Lack of Adequate Training

Research by Fakudze (2012) has revealed that the majority of the interviewed teachers in South Africa had not been trained in inclusive education whilst undergoing their initial teacher training. This explains their lack of clear and precise knowledge and understanding of inclusive education.

Lack of Support

Naicker (2008) states that support from district level can enhance a teacher's preparedness for inclusive education. Literature notes that collaborative administrative support is vital in order to monitor inclusive education policy implementation processes (Peters; Mackenzie, 2012).

Class Size

Large classes may be viewed as an obstacle to the successful implementation of inclusive education (Agran, Alper & Wehmeyer, 2002). As also reported by researchers such as (Avramidis & Norwich, 2002; Shongwe, 2005; Wylde, 2007), class size is a barrier to effective learning in an inclusive classroom. Large classes place an additional demand on teachers, while reinforcing concerns that all learners may not receive proper time or attention (Stoler, 1992; Van Reusen, 2001). The more learners with special needs in a class, the bigger

the challenge, learners need more one-on one time from the teachers (Avramidis & Norwich, 2002).

Inadequate resources

Koutrouba, Vamvakari & Theodoropoulos (2008) points out those schools with adequate and appropriate resources and material, and with adapted teaching material are instrumental in the development of teachers' positive attitudes in enhancing inclusive education. Many researchers including (Engelbrecht & Green, 2007). Florin (2008) and Stubbs (2008) emphasise that teaching resources and material, as well as the school facilities, are part of the contributing factors supporting inclusive practice.

Research design

This study adopted the quantitative design, as it employs survey methodologies and predetermined instruments for collecting data that can be analysed statistically. The approach is suitable for measuring attitudes and rating behaviours through standardised numerical scales (Creswell, 2009). Therefore, the study follows surveys because of the nature of problem statement which requires the researcher to measure the relationship among the variables statistically.

Population of study

The population of this study comprised a total of 75 inclusive education teachers from three high schools in Mdantsane and Newlands of which, school A consist of 23 and school B, 27 and school C, 25 teachers in Mdantsane and Newlands, East London Education District, Eastern Cape. I chose these three high schools as they were convenient in terms of geographical area.

Instruments

Melville & Goddard (2001), state that any device that researchers use for measurement is called an instrument. A questionnaire is an instrument most used in research projects. The study used a questionnaire as a way of obtaining information concerning the research problem.

Data analysis techniques

Sarantakos (2005) describes statistical techniques as methods of organizing and analyzing quantitative data. The data was analysed using descriptive statistics which involve computation. All hypotheses were tested at $P < 0.01$ *and* $P < 0.05$ level of significance. The SPSS (Statistical Product and Service Solution) was used to analyse the results. Although there were 75 respondents, 3 of the questionnaire were invalid as not all questions were answered.

The following section discusses results as per the questionnaire:

HYPOTHESIS ONE Ho1

There is no significant relationship between years of experience and teachers' attitudes towards the implementation of inclusive education.

Years of experience	Cor Coeff	P-value (Sig)	No.
My educational background and experience has helped me teach learners with special needs	.246**	.009	72
Teachers who are new in the teaching field are the ones with positive attitudes towards LSEN	.033	.732	72
Years of experience does not matter as long as training is provided for special needs	-.090	.338	72
Teachers with less experience have more accepting attitudes on inclusive education than their more experienced counterparts	-.042	.657	72
Teachers with 20 years' experience are more likely to be negative towards LSEN than those with less experience	-.127	.184	72

In this table the statistical significant level 0.01 level (2 tailed).

Table above reveals that there is no statistical significance between attitudes and years of experience, attitude score are as follows; (.009; p >0.01; .732; p> 0.01 ; .338; p> 0.01; .657; p> 0.01 .184; p >0.01).

Therefore, **Ho1** was accepted.

HYPOTHESIS TWO Ho2

There is no significant relationship between inadequate training and teachers' attitudes towards the implementation of inclusive education.

Inadequate training	Cor Coeff	P-value (Sig)	No.
I have been adequately trained to meet the needs of special needs learners	.213*	.025	72
I am provided with enough time in order to attend conferences/ workshop on teaching	.075	.428	72
I don't need training in order to	-.022	.824	72

teach

In this table there are two statistical significant levels 0.01 level (2 tailed) and 0.05 level (2 Tailed).

Table above reveals that there is no statistical significance between attitudes and inadequate training, attitude score are as follows; (.025; p>0.01; .428; p>0.01; .824; p>0.01).

Therefore, **Ho2** was accepted.

HYPOTHESIS THREE Ho3

There is no significant relationship between inadequate support and teachers' attitudes towards the implementation of inclusive education.

Support	Cor Coeff	P-value (Sig)	No.
A district based support team must assist the school with inclusive education challenges	.231*	.018	72
There should be an institutional level support team to assist teachers with learners with special needs	.233*	.020	72
There should be opportunities for networking between special needs school teachers and mainstream school teachers	.214*	.034	72

In this table there are two statistical significant levels 0.01 level (2 tailed) and 0.05 level (2 tailed).

Table above reveals that there is a statistical significance between attitudes and inadequate support, the attitude score is as follows; (.018; p>0.01; .0.20; p>0.01; .0.34; p>0.01).

Therefore, **Ho3** was rejected.

HYPOTHESIS FOUR Ho4

There is no significant relationship between class size and attitudes towards the implementation of inclusive education.

Class size	Cor Coeff	P-value (Sig)	No.
It is impossible to teach a class of 50 learners including learners with special needs	-.024	.802	72
To teach effectively, a class should not have more than 20 learners with special needs	.052	.597	72
The more LSEN's in the class, the less time given for other learners without special needs to be taught	-.025	.799	72
There should be not more than 2 LSEN in a class of 30 learners	.098	.299	72

In this table the statistical significant level 0.01 level (2 tailed).

Table above reveals that there is no statistical significance between attitudes and class size, the attitude score is as follows; (.802; $p>0.01$; .597; $p>0.01$; .799; $p>0.01$; .299; $p > 0.01$).

Therefore, **Ho4** was accepted.

HYPOTHESIS FIVE Ho5

There is no significant relationship between inadequate resources and attitudes towards the implementation of inclusive education.

Inadequate resources	Cor Coeff	P-value (Sig)	No.

District resources are available to assist with LSEN in my school	-.008	.929	72
There's sufficient funds and resources to facilitate effective teaching of LSEN	.024	.804	72
I am provide with sufficient material in order to make appropriate accommodation for learners with special needs	.135	.160	72
Adaptive material and equipment are easily acquired for meeting the needs of learners with special needs	.028	.768	72
It is necessary to have physiotherapist and psychologist in our school to help learners with disabilities	.127	.194	72

In this table the statistical significant level 0.01 level (2 tailed).

Table above reveals that there is no statistical significance between attitudes and inadequate resources, the attitude score is as follows; (.929; p>0.01; .804; p>0.01; .160; p>0.01; .768; p> 0.01; .194; p> 0.01**).**
Therefore, **Ho5** was accepted.

Discussion of findings

The findings show that there is no significant relationship between years of experience and teachers' attitudes towards the implementation of inclusive education. It further shows that there is no significant relationship between inadequate training and teachers' attitudes towards the implementation of inclusive education. On lack of support there is a significant relationship between lack support and teachers' attitudes towards the implementation of inclusive education. Although the null hypothesis states that there is no significant relationship, the p-value showed that there is a significant relationship. Therefore the null hypothesis is rejected. With regards to class size findings show that there is no significant relationship between class size and teachers' attitudes towards the implementation of inclusive education, as well as inadequate resources findings show that there is no significant relationship between inadequate resources and teachers' attitudes towards the implementation of inclusive education.

Conclusion

Findings reflect that there is no significant relationship between attitudes and the factors as identified except mainly for the lack support which showed that there is a significant relationship between attitudes and factors affecting implementation of inclusive education. This paper concludes that it is possible to include children with disabilities within the mainstream classes as the attitudes are not necessarily affected mostly by the factors highlighted. Despite inadequate training, inadequate resources, years of experience and large

class large sizes, the main factor that impacts on attitude towards the implementation of inclusive education is the lack of support from district and institutional level, and opportunities for networking.

Recommendations

Based on the research findings: the study makes the following recommendations: In this study the main focus was on the teachers' attitudes towards the implementation of inclusive education, as influenced by various factors as identified in the literature. The paper recommends that there is a need for adequate training and control of class sizes in the implementation of inclusive education. It also recommends that there should be adequate resource materials to facilitate the implementation of inclusive education. Mainly however, the visible support is required from the Department of Education through District Officials and at institutional levels through school management teams, school governing bodies and principals. The results of this study indicates that attitudes towards implementation of inclusive education, are influenced mostly though support by these structures (or the lack thereof). The Department of Basic Education should in line with Policy, embark on a strategy of lobbying support at the levels as identified.

Limitations of the study

This is a quantitative study, based on a closed-structured questionnaire and has not delved into the reasons for the lack of support by governance structures. It was also limited to schools in a particular Education District and cannot necessarily be generalized to other schools and education districts. Further studies on the area are also encouraged in terms of the type of support that is needed to implement inclusive education.

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UTILIZING MODELLING AND SIMULATION TOOLS IN TEACHING POWER SYSTEMS ENGINEERING

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Abstract
Today's power systems are complex, interconnected and highly robust. Modern power systems also require high efficiency and reliability coupled with low emissions and minimal environmental pollution. Blackouts and brownouts have grave spill over effects on the populace and therefore have lots of economic, social and political implications. In this work, the motivation for modelling and simulations as the method of choice to pass across key power system concepts at the undergraduate level is given. PowerWorld and Matpower are introduced as the preferred software and the experience gathered using these tools in teaching fourth year students in the Department of Electrical & Electronic Engineering Science at the University of Johannesburg is discussed. Complementary teaching actions like getting industry experts to speak to the students and organizing site visits to power stations and substations are detailed in order to give students the practical feel of power systems. Challenges encountered and recommendations to enhance the use of modelling and simulations tools in power systems education are discussed.

Keywords: Modelling and simulation, power system engineering, engineering educators, PowerWorld, Matpower.

Introduction

Recent developments in the power system industry have led to the need for smarter and more innovative ideas in the control and operation of today's power system. These developments range from ever increasing demand for electrical power by the world's populace to directives in most nations of the world for a massive reduction in harmful emissions and greenhouse gases (Nwulu & Xia, 2017). A number of developing nations are grappling with aging power systems and components and lack of capacity to finance expansion plans for generator, transmission and distribution facilities. On the education and training front, the massive incorporation of renewable energy sources into the grid, the advent of the smart grid, demand side management, internet of things amongst other cutting edge paradigms have led to significant challenges for power system educators and highlighted the need for a massive overhaul of teaching and learning methods in order to prepare students for today's modern power systems (Turner & Foreman, 2014). It is now widely accepted that concepts such as mathematical optimization, optimal control, telecommunications and power electronics have to be introduced into the power system curriculum (Greenhall et al., 2012).

South Africa is coping with the aforementioned challenges. However, in addition to those challenges South Africa still grapples with a general lack of skilled personnel in the engineering profession in proportion to the wider population (McKechnie and Bridgens, 2008). This is attributable in large parts to the low number of students with grades good enough for tertiary engineering studies and the historical education legacy in South Africa. There is thus a need for more engineers in South Africa (especially in the power sector). This

is in addition to the need for a holistic overhaul of power system engineering teaching and learning. To this end, it is believed that modelling and simulation which has played a crucial role in this regard in other countries (Turner & Foreman, 2014) will have immense benefits in the South African context. This paper therefore presents the motivation behind the heavy reliance on modelling and simulation in effectively teaching power systems at the University of Johannesburg. The paper is thus organized as follows: The next section gives a brief introduction to modelling and simulation. This is followed by a description of the power systems course content at the University of Johannesburg. The subsequent section details power flow analysis (an important topic in the course) and how modelling and simulation was used in explaining concepts better. The next section gives practical general lessons in teaching and learning as gleaned from the author's experience after which the paper is concluded.

Modelling & Simulation

The aim of modelling and simulation is essentially to replicate the behaviour of a physical system or phenomena. This allows for the analysis, prediction and control of the phenomena or system of interest. Typically, modelling and simulation makes use of computer programs or a suite of software and the underlying philosophy behind these programs is to enable the modeller focus on the system dynamics and not so much on coding (Turner & Foreman, 2014). It is however pertinent to note that the modeller is expected to have some knowledge of the software/computer program/coding language in order to successfully depict the phenomena or system of interest. In general there are two broad approaches to modelling and simulation. The first is event based modelling and the second is process based modelling (Hillston, 2017). Both approaches are briefly detailed below:

Event Based Modelling

This modelling framework caters for the different actions, procedures or events that can occur in a system or that happen when a natural phenomenon occurs (Hillston, 2017). The aim is to accurately depict these occurrences in order to glean underlying insights about causal factors and remedial actions (Hillston, 2017). This modelling framework has diverse applications in fields like telecommunications, aeronautics, computer networks, etc. This modelling technique also has applications in power systems engineering. A prominent example of this modelling approach in power systems is the Static Economic Dispatch (SED) problem (Nwulu & Xia, 2015).

Process Based Modelling

Process based modelling is simply modelling an order or sequence of inter-related events (Hillston, 2017). The individual events are separated by time and occur in either a sequential or random order. Deployment of this modelling framework abounds in the natural sciences, engineering, social sciences etc. Applications in power systems include power system outage and restoration studies, demand response modelling and control (Nwulu & Xia, 2015) amongst others.

Power System Analysis

The Power System Analysis course (KRL 4B21) at the Department of Electrical & Electronic Engineering Science, University of Johannesburg is a fourth year course meant to deepen the students understanding of concepts, components and systems that relate to a power system The students are expected to utilize this understanding in problem solving and power system analysis. The major pre-requisite of the course is Power Systems 3A which serves as an introductory course to general power system concepts and analysis. As conceptualized in the course's study guide, the students are expected to:

- Familiarize with basic Safety Issues relating to Power Systems
- Understand Power Systems as an integrated system
- Understand Components of a Power System & related issues
- Basic Hands on Practical Aspects in Power Systems.

The above serve as the course envisaged aims. From the four aims listed above, it is obvious that the first three can be reasonably achieved via formal lectures. The last aim (providing basic hands on practicals) is difficult if not impossible to achieve in the classroom and ideally requires hands on exposure of students to power stations, machinery, equipment or operational modalities of a power system. In reality this is not always feasible. The power system impacts heavily on society and the economy and requires high reliability, robustness and stability. Furthermore, downtimes (in form of blackouts or brownouts) are highly undesirable and unpredictable. All these factors conspire to ensure that real exposure to power system components isn't always possible and students often fail to tie theoretical concepts gleaned in class to practice. This has then made it imperative that power system educators effectively make use of modelling and simulation tools to combat the challenges they face in providing hands on experience to students. Power system educators also invest time and thought in other actions like inviting industry practitioners and experts to speak to students and organizing site visits to power stations and substations in order to give students the practical feel of power systems The course spans 14 weeks and the course's content per week is given in Table 1.

Table 1. Power Systems Analysis 4B course contents.

Week	Content
1	Introduction to Power Systems: Power Systems Overview, Safety in Power Systems
2	Basic Principles
3	Generator &Transformer Models; the per unit system
4	Generator &Transformer Models; the per unit system
5	Transmission Line Parameters
6	Line Model &Performance
7	Power Flow Analysis
	Recess
8	Unit commitment and optimal dispatch of generation
9	Balanced Fault
10	Symmetrical components and unbalanced faults
11	Transmission & distribution solid state

	controllers
12	Harmonics
13	Power system protection
14	Module review

SOURCE: 2016 Power System Analysis Study Guide, University of Johannesburg.

The course contents hitherto given in Table 1 are sub-divided into four outcomes. This ensures that interrelated concepts are treated together and explained clearly. Table 2 gives the breakdown of the outcomes, assessment criteria and methods.

Table 2. Module outcome contents, assessment criteria and method.

Module Outcome	**Description** ***(What the learners must be able to do.)***	**Assessment Criteria** ***(What action must be completed to show outcome achievement.)***	**Assessment Method** ***(How the outcome achievement action will be assessed.)***
A	Fundamental understanding of the following: • Power systems overview • Basic Concepts • Generators • Transformers	The student must demonstrate competency by passing tests	Tests
B	Fundamental understanding of the following: • Transmission Line Parameters • Line Model & Performance • Power Flow Analysis	Successful demonstration of the understanding of these concepts by passing tests.	Tests
C	Understanding of the following: • Optimal Dispatch of Generation • Balanced Fault • Symmetrical Components & Unbalanced Fault • Transmission line & distribution • Harmonics • Power system protection	Successful demonstration of the understanding of these concepts by passing tests.	Tests

D	Demonstrated ability to carry out assigned powersystems related tasks in the form of practicals.Also demonstrated ability for technical communication	Successful mastery in the use of PowerWorld and Matpower as evidenced from practical reports. Also demonstrated ability for technical communication as evidenced from practical reports.	Lab work+ reports

SOURCE: 2016 Power System Analysis Study Guide, University of Johannesburg.

The following table is an indication of the teaching methods applied to achieve the module outcomes:

Table 3. Teaching methods for each outcome.

	Module Outcome			
Teaching methods	**Outcome A**	**Outcome B**	**Outcome C**	**Outcome D**
Formal lectures	x	X	X	X
Lab work				X

To pass the course, each student is expected to get at least 50% in assessments for each outcome and failing one outcome means the student has failed the whole course. In this course, the two software tools for modelling and simulation are PowerWorld and Matpower. As a case study, we demonstrate the use of these tools on the power flow problem and highlight advantages of each tool. The next section briefly describes the power flow problem.

Optimal Power Flow

The power flow procedure is a fundamental and arguably the most popular tool in power system analysis. In essence it seeks to determine the voltage in every node/bus in a power system and the power flowing through transmission lines and transformers (Turner & Foreman, 2014). Each bus node can take three forms. They are either a slack bus, voltage controlled (PV) or a load bus (PQ). To obtain the node voltage and power flow, a system of non-linear equations is obtained and solved using iterative algorithms (Turner and Foreman, 2014). Popular iterative algorithms include the fast decoupled method, Newton Raphson method and the Gauss Seidel method (Zimmerman et al., 2011). Critical issues with the solution algorithm include computational speed, solution initialization, convergence, accuracy of solutions etc. Table 4 gives the different bus types in power flow studies.

Table 4. Various bus types and variables in power flow studies.

Type of Bus	**Variables**			
	P	***Q***	***|V|***	***Δ***

Slack	Unknown	Unknown	Known	Known
Generator (PV)	Known	Unknown	Known	Unknown
Load (PQ)	Known	Known	Unknown	Unknown

The power flow solution method (especially the two popular solution algorithms: Newton Raphson method and the Gauss Seidel method) can be taught traditionally in the classroom. However students barely understand the solution methodologies and fail to appreciate the algorithmic differences. When students don't understand the basics, they are unable to appreciate much more complex setup: with phase shifting and tap changing transformers amongst other advanced setup and topics. To aid students understanding of this concept amongst other important concepts, PowerWorld and Matpower are introduced as simulation tools of choice. The reasons for their choice and how to apply them are briefly detailed in the subsequent subsections.

PowerWorld

PowerWorld is a commercial, GUI based simulation software that models power system operation and components (Kaur et al., 2010). Ideally power systems have and operate in three phases. Since all three phases are assumed to be balanced under normal operations, it enables the power system to be modelled and analysed as a single phase. Single phase systems are represented graphically by one line diagrams which connect different power system components. The representation by one line diagrams and single phases are for ease of analysis as in reality the system is still in three phase (Turner & Foreman, 2014). Each of the components can be adapted and given their own custom configuration and various forms of analysis ranging from the simple (normal power flow) to the complex (fault analysis) can be performed. Figure 1 gives a sample one line diagram.

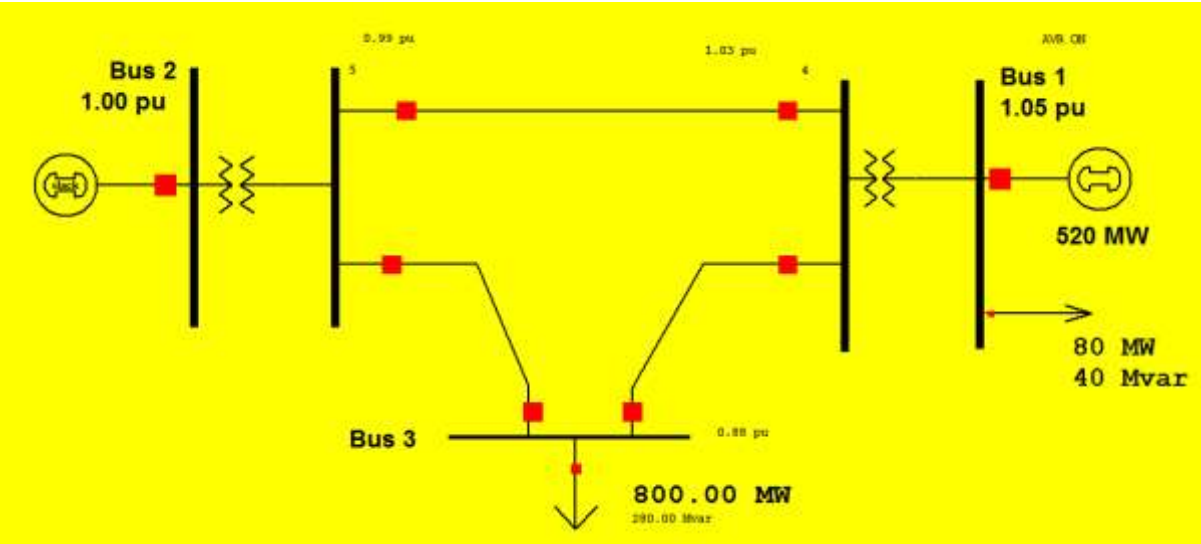

Figure 1. A one line diagram in PowerWorld (Liu &Gibescu , (n.d.))

An advantage of PowerWorld is the easy to use GUI and the fact that this enables the custom configuration of components with varying definitions. A power system can easily be built from scratch and an existing (or practical) power system can easily be modified or tweaked. The advantage is that students are not burdened with a steep learning curve when

familiarising themselves with the software. The GUI feel is intuitive and students in no time grasp how to use the software. Students do not have to spend countless hours writing lines of code and results visualization is also straightforward and intuitive. The ability to represent electric power flow as a one line diagram and the attendant ease of analysis is also a major advantage. PowerWorld also allows for sensitivity analysis and scenario analysis (Kaur et al., 2010). This is very important as this is the major way students can glean insights about the various causal factors for operational conditions in the power system. Most times students experience a "light bulb" moment and lots of theoretical calculations from the classroom only become clearer when sensitivity analysis or scenario analysis is performed. This incentivises students to self-study because of the interest the practical insight has generated. When students use PowerWorld for experimentation with real-world data, they gain an intuitive feel for power system analysis that formal classroom lectures and even simulated data cannot give.

Matpower

Matpower is a collection of straightforward, open source, easy-to-use M-files used for running optimal power flow routines. With the incorporation of renewable energy into most power system operations, Matpower has also added increased functionality and is able to handle related problems like stochastic unit commitment, generator scheduling, economic dispatch amongst other renewable energy problems (Zimmerman et al., 2011). Although Matpower isn't GUI based, it makes up for this by the fact that it is able to handle computationally intensive tasks and does it with code that is readily understandable and thus can be easily modified. In the power systems course, the students were instructed to use Matpower for cases that they had hitherto solved using PowerWorld and to perform sensitivity analysis and scenario analysis for the same cases they had used PowerWorld. The aim is to re-inforce the learning they got via PowerWorld (GUI based) with the computationally based Matpower. This is very important for power system engineers when they will have cause to extend existing power systems and add constraints that might not be easily incorporated in PowerWorld. It might behove on them to code it themselves. Also if there is need to perform a comparative analysis of various iterative solution algorithms in terms of speed and accuracy; it is imperative that they know how to do this. In other words, this means that Matpower helps students to understand how to create their own solution algorithms. The fact that Matpower is open source also means that students (who are often cash strapped) can deploy this tool on their personal machines and use it as the need arises as opposed to commercial software with yearly licences.

General Lessons For Teaching & Learning

From the experience of the authors, it is clear that modelling and simulation tools can greatly aid in enriching the learning experiences of students in power systems engineering. This collaborates experiences of other power system academics in the literature (Milano et al., 2008, Temiz & Akuner, 2009). Milano et al., (2008) posit that the use of modelling and simulation improved the number of students that passed the course by 14% than when the power systems course was offered without modelling and simulation. It is difficult to perform a similar analysis in our case as a control case (lecturing the course without modelling and simulation) is not available for comparison purposes. However feedback from students

showed that they gleaned more insight when modelling and simulation was incorporated as opposed to only formal lecturing sessions. In summary a number of lessons learnt from the incorporation of modelling and simulation can be summarized thus:

- Start with simple examples/case studies before going to much more complex ones: For any modelling and simulation software, it is advisable to start with a test case study (with minimal number of buses; preferably two) before going to much larger test systems studies and then onto practical power system setups.
- Complement computational simulation methods with GUI based methods: It is not advisable to use one approach exclusively. Complete learning is achieved when both are used complementarily. Again, it is advisable to expose students to GUI based methods before exposing them to computational based methods. As discussed earlier students were made to solve optimal power flow routines using the same test systems which afforded them the opportunity to try the black box approach first (PowerWorld) and later use a method that sought to make them understand the solution algorithm.
- Utilize sensitivity analysis/scenario analysis method in order to deepen students understanding about concepts.
- Always introduce students to open source software: Due to the fact that most commercial software require yearly licence fees, a good legacy to bequeath to students would be to teach them how to become proficient in open source modelling and simulation software. Apart from the fact that this is a cost saving measure, it also enables the students install
- It is important that scientific field trips are organised for students to view (even if it's from a safe distance) a major power system unit. These can either be a local substation, a distributed generator, utility control room etc. Even though it would be impossible to guarantee hands-on training for students the explanations from active duty personnel goes a long way in enabling students learning. Care must be taken that students safety is not compromised during these visits.
- Finally, it is also imperative that guest lecturers from industry are also invited to give talks to students. These guest lectures must be properly thought out and structured and done to ensure that students are given a mixture of high level and detailed overview of the power system. The lectures should cover power system components, operational and control issues, regulatory issues, environmental issues, financial issues and other salient issues students are bound to encounter in practise. These lectures can also be targeted to cover other auxiliary ECSA outcomes that are not directly under the purview of the course.

Conclusions

A plethora of factors have made it imperative for power system engineering educators to re-evaluate the way they approach teaching and learning. Some of these factors are due to the increasing complexity and sophistication of the power system. Other factors are due to the fact that the nature of power system makes it impossible to avoid modelling and simulation tools. Furthermore, power system educators have reported increased students pass rates when modelling and simulation tools are incorporated into teaching and learning. In this work, we detail our experience in implementing modelling and simulation tools in teaching Power Systems engineering at the University of Johannesburg. The particular software tools and the reasons why they were chosen are given and we conclude with lessons to be considered when

utilizing modelling and simulation in an engineering course in general and in power systems in particular.

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TEACHERS' PERCEPTIONS ON CURRICULUM CHANGE AND IMPLEMENTATION OF LIFE SCIENCES IN THE BOJANALA DISTRICT OF THE NORTH WEST PROVINCE

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Abstract

The study sought to provide information about Life Sciences teachers' perceptions on curriculum change and implementation in the subject Life Sciences in South Africa. The Life Sciences subject underwent a series of content changes within a very short period of time, which affected both the teaching approach and assessment methods. The paper wanted to shed light on how teachers measure the synergy between changes effected in this subject and mechanisms provided to deal with such changes. A qualitative research design was employed in this study. The researcher used both one-to-one interviews and one focus group interview to collect data from Life-Sciences teachers in the Bojanala District in the North West province. The findings of this research indicated that teachers felt that the policy changes were too rapid and that they were not adequately empowered to deal with such policy changes a situation that made implementation of the policies difficult.

Keywords: Life Sciences, Curriculum change, Curriculum implementation, Teachers perceptions.

INTRODUCTION

In South Africa, a highly sophisticated curriculum was introduced into an educational system already under considerable stress (Rogan, 2007). By this Rogan (2007) was referring to South Africa's move from a content-based curriculum into an outcome-based curriculum policy, which became the most ambitious curriculum policy since the installation of the Government of National Unity (Jansen, 1998). The study was based on curricula changes in the subject Life Sciences in the Further Education and Training band (FET), which took place from 1996 until 2012. After 1994, the African National Congress (ANC) government worked on the Reconstruction and Development Program (RDP) of which the main aim was to heal the nation from the atrocities bred by the apartheid regime. The RDP program was applied in all spheres of life, including education. The curriculum of Life Sciences (initially called Biology) was subjected to a series of policy revisions after 1994, namely the Interim Core syllabus (ICS) in 1996, National Curriculum Statement (NCS) in 2006, New Content Framework (NCF) 2009, and Curriculum Assessment and Policy Statement (CAPS) 2012. The focus of this study was to report on Life Sciences teachers' perceptions of the above

curriculum changes and its implementation. In all these policy changes, the content structure, teaching and learning approach, and assessment approach were changed.

There is a need to engage in this study because Jansen (2003) has observed that almost all the current literature on educational change emanates from stable Western democracies. Jansen posits that while much of what has been written may be applicable to developing countries, there is a need to rethink some of the issues because we find ourselves in a different context. In line with the above-mentioned statement, the study is even more important because South Africa, as a developing country brought curriculum innovations derived from the Western countries (Jansen 1998, Christie, 1997) for example the OBE approach to teaching and learning. One would wish to know how the implementers of policies perceive such innovations.

Some literature about curriculum change in South Africa has been published by Jansen (1997), Kraak (1998), Chisholm (2003) Hoadley and Jansen (2009). The above-mentioned authors critiqued the enormous policy changes which was followed by changes in the curriculum (review and design). The study concentrates more on curriculum change in the subject Life Sciences and seeks to uncover how teachers perceive the changes in this subject as well as the relationship between curriculum change and curriculum delivery. Specific studies on Life Sciences curriculum were published by de Villiers (2011), Ferreira (2011), Johnson, Dempster and Hugo (2011, 2015). The authors made a significant study of the Life Sciences curriculum for an example, the topics of this subject were scrutinized in trying to discern whether they represent the mother body (Biology) or not, whether these topics fascinate the learners or not, as well as challenges with regard to the teaching of the subject to second-language learners. Johnson et al (2011, 2015) made a thorough study of the Life Sciences curriculum during the years (1996-2012) which is the focus of this study. The findings of the study by Johnson et al indicated that during policy changes in South Africa, the Life Sciences content was changed in the Further Education Band (FET) Grade 10-12 during the years 1996 (Interim Core Syllabus), 2006 (National Curriculum Statement), 2009 (New Content Framework), and 2012 (Curriculum Assessment Policy Statement). This study is an extension of the above-mentioned studies focussing more on how teachers perceive a plethora of policy changes introduced by the South African government.

So far, there is no literature that covers the “voice” of Life Sciences teachers with regard to the curriculum changes that took place from 1996 to 2012. The study would give a holistic view of teachers’ perceptions towards the government’s post-apartheid initiatives, which were above all, meant to address the legacy left by the apartheid regime. In this study, teachers’ views towards curriculum changes in Life Sciences would be aired and, more importantly, information will be gathered on how these teachers dealt with the delivery of these changes. Such information will assist curriculum designers to be aware of the experiences of those who play an important role in implementing the policy.

THE CONTEXT OF THE STUDY

The Life Sciences curriculum in South Africa, as with other policy documents, changed three times within a period of seven years. Even though curriculum change in South Africa has been ongoing since the 1930s (Gultig, Hoadley & Jansen, 2002), the changes to this subject were more frequent than any other FET subject. The study focuses on four policy changes namely, the Interim Core Syllabus (ICS,1996), National Curriculum Statement (NCS, 2006), New content Framework (NCF, 2009) and Curriculum and Assessment Policy Statement (CAPS, 2012). During the ICS, the syllabus was highly academic in its approach and it comprised both higher grade and standard grade Biology papers. The NCS differed from the ICS in structure and emphasis and the original name, Biology was changed to Life Sciences. The approach changed to an outcomes-based one and the subject was organised into three learning outcomes, namely. 1-Scientific inquiry and problem solving, 2- Construction of knowledge, and 3-Nature of science and its interrelationships with technology, indigenous knowledge, the environment and society.

Due to a high dissatisfaction (from teachers) with the under-specification of content in this policy, it was revised three years later and changed to a totally new policy called the New Content Framework. According to Johnson, Dempster and Hugo (2011) the new version retained the knowledge areas and the learning outcomes with slight modifications, but substantially altered the structure and focus of the content material, and provided for detail. According to these authors, the NCS retained the hierarchical structure of the parent discipline biology in terms of its inclusion and balance of biology concepts (Johnson, Dempster & Hugo 2011).

The last policy change, namely CAPS was described by the minister of education, as being extensive and widely consultative (DBE, 2011). According to the minister, those who were tasked to write CAPS were to aim for coherence from one phase to the next and build up coherence within subject-boundaries in order to ensure a sense of moving progressively to greater depths and from simple to more complex concepts from grade to grade (DBE 2011).

THEORITICAL FRAMEWORK

The study unpacks the perceptions of teachers with regard to curriculum change and implementation and it is therefore, underpinned by curriculum development theory, called Hunkins' Decision making Model (Hunkins, 1980). Ornstein and Hunkins declared openly that a complex phenomenon such as a curriculum could not be explained by a simple or simplistic theory because theorizing is only a process that engages researchers in imagining the how and why of certain phenomena (2004). Based on the above declaration, the researcher acknowledges that Hunkins's Decision making Model is, one of many theories dealing with curriculum development. The model will be used to analyse the development of a Life Sciences curriculum content.

Various authors alluded to the fact that curriculum change is an ongoing process (Ornstein & Hunkins, 2004, You 2011). Even though this exercise normally meets resistance, it cannot cease to exist because it is informed by the changing educational needs, high expectations from the public and policy reports, which demand educational change (Cheng, 1994). When a curriculum is changed, a new plan is brought forward and this is called curriculum development (Ornstein & Hunkins, 2004). Curricularists differ in ways to develop a curriculum based on their belief of what a curriculum should be. The myriad definitions of what a curriculum entails, shows different ways of curriculum development.

Hunkins's Decision making Model is one of the Technical scientific approaches to curriculum development. The proponents of this approach see curriculum development as a way of planning curricula to optimize students' learning and allow them to increase their output (Ornstein & Hunkins 2004). Hunkins's Decision making model comprises seven major stages, namely curriculum conceptualization and legitimization, diagnosis, content selection, experience selection, implementation, evaluation and maintenance.

The first stage of curricular decision making, namely curriculum conceptualization and legitimization is critical and as posited by Ornstein and Hunkins (2004) all those affected by a curriculum should be involved in the process of development. The role of Life Sciences teachers cannot be over-emphasised in deciding what to change in the Life Sciences content since they are the one who formulate master plans prior to creating or implementing the plan to students (Ornstein and Hunkins 2004).

Curriculum diagnosis is the second stage and it involves identification of needs. A wide published literature encouraged the inclusion of teachers in identifying what needs to be included in curricula (Hoadley and Jansen 2009, Kennedy 1987, Metherell 1990). During this stage, the Life Sciences teaches would be provided with an opportunity to identify the needs related to the subject Life Sciences. Based on their wide experience as teachers, Life Sciences teachers are better suited to bring to the fore what basic needs are crucial in the development of the Life Sciences content. When teachers (representatives of unions) become actively engaged in issues that relates to curriculum change, they will have a feeling of ownership which, according to Lovat & Smith is a prerequisite for ensuring commitment by all those involved in implementing the change (1998)

After needs are analysed, content selection will be the next stage. This deals with the "what" of the curriculum. In the case of Life Sciences, this is the stage where designers including teachers select the knowledge and skills to be learned in the subject, for example a selection of topics for the entire phase. One of the steps to be followed in selecting content is to check the learnability of the content, which is a step to ensure that there is optimal placement and appropriate organization and sequencing of content (Ornstein & Hunkins, 2004). These authors also suggested that the sequencing of content should be done from the simple to the complex and that the way the content is sequenced should show continuity (Ornstein & Hunkins, 2004).

The next step in the model is experience selection and it involves questions on how the content is to be delivered to students or experienced by them. The new content selected by designers including teachers will be easy to implement since it will be an exercise that combined what is claimed to be the features of top-down and bottom-up approaches to curriculum development (Priestley 2011). By this, Priestley meant that bureaucrats did not impose curricula, but it was a collaborative exercise taking the needs of those affected directly or indirectly into consideration.

The implementation step is the one which receives much resistance from the implementers themselves (Lovat & Smith 1998, McCarrick 2009, Hoadley & Jansen, 2009 and Ornstein & Hunkins, 2004). One reason why teachers resist change is when change is rapid that according to Ornstein and Hunkins teachers will not commit their energy to curricular changes that have little chance of lasting (2004). Another reason why teaches resist change is that the new curriculum is not compatible with teachers' existing values, experience or perceived needs (Hoadley & Jansen 2009). Due to this shortcoming, teachers might feel that they are not qualified or experienced enough to deal with the new curriculum and thus the provision of sufficient training will ease teachers' tension.

The final stage of Hunkins' model is maintenance. It encompasses the methods, and means by which an implemented programme is managed to assure its continued effective functioning. For Life Sciences teachers, maintenance would refer to provision of resources such as textbooks, libraries, laboratories, human resources and classrooms that will make implementation easy.

Hunkins's Decision making model has serious implications for the development of the curriculum in the South African context. It confirms a collaborative engagement in curriculum decisions where all stakeholders play an active role in deciding what needs to be included in the curriculum. The model also stresses the importance of selecting the relevant content to suit the needs of not only the designers, but also those of the leaners. According to this theory, curriculum change and development should not be sporadic, but it should be given time for designers to look into gaps and work towards bridging such gaps. The model also highlighted the importance of support, which is a necessity to avoid resistance to change.

METHODOLOGY

Research design

A qualitative research design was used focusing on participants' perspectives and experiences, and utilised tacit knowledge, intuitive and felt knowledge (Creswell, 2009). Since the study focused on exploring teachers perceptions on curriculum change in the subject Life Sciences, the study was based on the constructivist/exploratory approaches. As far as the constructivist worldview is concerned, the researcher relies as much as possible on the participants' views of the situation being studied (Creswell, 2013), whereas in exploratory

research the explorer develops a synthesis of views and ideas leading to a detailed and profound understanding of the group (Stebbins, 2001).

Sample

In the study, the sample was purposefully selected. In purposeful sampling, the enquirer selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon in the study (Creswell, 2013). The population for the study comprised of Life Sciences educators in the Bojanala District of the Northwest Province. A group of 26 Life Sciences teachers who taught the subject during the years in which major changes occurred were selected as a sample: this approach makes use of a "criterion" sample, which refers to multiple individuals who have experienced the phenomenon (Creswell, 2013). A heterogeneous group of participants was selected, consisting of both males and females and different races (black, white and Indian). The researcher applied the ethical clearance process of informed consent, privacy and confidentiality. Participants were informed about the nature and results of the research and their confidentiality was assured as the primary safeguard against unwanted exposure (Denzin & Lincoln, 2013). All participants signed a consent form, but they were also made aware that they had the right to withdraw from the study at any point.

Data collection strategies

Qualitative data collection strategies were used because they enable a deeper understanding of individual contexts, perspectives and experiences, through immersion in the participants' social and cultural context (Jensen & Laurie, 2016). Data were collected by 1 focus-group interviews and 20 one-on-one interviews. As far as focus groups discussions are concerned, the chosen size of the group should be guided by two considerations namely; the focus group should not be so large as to be unwieldly or to preclude adequate participation by most members, nor should it be so small that it fails to provide substantially greater coverage than that of an interview with one individual. The focus group in this research consisted of six participants (four females and two males). 13 females and 7 males formed the one-on-one interviews and it took place at the venue preferred by participants.

A semi-structured interview strategy was used in the development of questions, because this technique allows the researcher to ask probing questions to explore what participants say in more detail (Jensen & Laurie, 2016; Hoets, 2012). The interview guide consisted of open-ended questions that included follow-ups.

DATA ANALYSIS

Data analysis involves segmenting and taking apart the data (like peeling back the layers of an onion) and putting it back together again (Patton, 2002). The researcher engaged in thematic analysis of data using the Saldana method of qualitative analysis. Firstly, data were broken down into codes. Saldana (2016) describes coding as the "critical link" between data collection and their explanation of the meaning. Coding was thus done through the

identification of patterns, which demonstrated habits, salience, and importance in people's daily lives. Data were then categorised by grouping, reorganising and linking the codes in order to consolidate meaning. Finally, themes emerged from such categories and were used to discuss the findings of this research.

FINDINGS

From the data collected, it became clear that teachers had both a positive and a negative perception of curriculum change. Some of the teachers expressed their positive feelings towards the changes experienced in the Life Sciences content. The majority of participants seemed to favour the CAPS policy because they commented that it is not about memorising the content, it also allow application of knowledge. Even though CAPS was seen as an improvement from the previous policy changes, teachers indicated that there was still other topics, which they did not prefer. Below are comments by participants:

Participant A: there is an improvement in CAPS content although there is a topic on phylum which is confusing. The new Life Sciences favour application of knowledge so learners are enjoying it. Work that is more practical is done so learners are not only expected to master content but also to apply knowledge.

Participant B also supported the view that CAPS was better than other policies by stating that CAPS content is aligned to career paths. This is what he said:

the content we are teaching is now prepare learners for tertiary education. Learners struggled to pursue careers in medicine because of the type of teaching and learning that prevailed. CAPS makes the teaching of the subject interesting because they emphasise real-life problems, for example learners are taught about diseases of the brain, ear, eye and so forth.

Conversely, there were those educators who had negative feelings about policy changes in the subject. Participants responded by saying that many policy changes brought confusion and a lack of content coherence. According to the teachers, the confusion was brought by the fact that topics were shifted from one grade to another. The problem with the shifting of topics was that some of the difficult topics, which initially were taught in higher grades during the previous policy change, were now moved to lower grades. Below are the comments.

Participant C: The curriculum has been changing from time to time. Some topics were removed and reintroduced again. This has led to confusion. In some instances, they removed topics (OBE approach) and later the topics are reintroduced. Presently, I have realized that there were certain topics that were shifted. There was topic movement within the grades. You are used to teaching a particular topic in a particular grade then it is being shifted. Many changes are making educators and learners more confused. It is difficult to adjust to changes every three years. Teachers are learning every day. There is no time to say they have

mastered the content. Teachers learn with the learners and they feel like resigning because they are stressed up.

Effect of changes on the learners

According to participants, learners are affected by the changing curriculum in many ways, for example in the OBE approach there was an under-specification of content. Majority of the participants had a feeling that those learners who did the OBE will not perform well in tertiary education because they lack background knowledge. In the subsequent changes that followed, for example in CAPS the shifting of topics made designers to put very difficult and abstract topics in Grade 10. Below are participants' comments:

Participant D: CAPS Grade 10 syllabus is not easy to teach. The topics are difficult. Learners do not understand the work. in CAPS there is a link but selection of topics in grades must be checked again. The most difficult grade is Grade 10. The grade 12 syllabus is OK, but Grade 10 topics are more and need more time to complete. Grade 10 learners are forgetful and some topics are difficult e.g water relations, it used to be taught in Grade 12 in the previous years. There is too much scope of work for Grade 10 and it is difficult for educators to complete the syllabus in time, therefore no chance of revision.

Teachers made it clear that learner performance, especially in Grade 10, is very poor. This is because there is a wide gap between this grade and Grade 9, and they even mentioned the language barrier as one other factor that contributes to the difficulty of the Grade 10 content.

Participant E: The standard of topics and syllabus in Grade 10 is too high and learners are performing very badly. The language barrier of the learners affect the teaching and learning process. There is a significant difference between assessment in Grade 9 and 10 namely Grade 9= 60% School-based Assessment (SBA) and 40% exam, Grade 10 = 25% SBA and 75% Exam. Even the question papers differ. In Grade 10 learners write two papers of 150 marks each and in Grade 9 learners write one paper of 100 marks.

Implementation challenges

Educators also worry about resources. They complained about some textbooks that were not of good quality. The absence of well-equipped laboratories and inadequate training by subject advisors was also mentioned. When changes were made, educators were trained for only three days. They considered this not to be enough because new topics e.g evolution were introduced and they were not familiar with the content.

Participant F. Some of the textbooks prescribed are not of a good quality. The redeployment of educators led to shortage of qualified educators and overcrowded classrooms. We attended a 3 days workshops in all the policy changes, it is hard for us, we did not learn anything during the workshops. I attended the government sponsored ACE program to learn about the topic evolution because I know nothing about it. But the ACE program, did not give educators content, only methodology was taught.

DISCUSSION

From the findings it became very clear that even though educators have the tendency to resist change, (Lovat & Smith 1998, McCarrick 2009, Hoadley & Jansen, 2009 and Ornstein & Hunkins, 2004) they were not concerned about change itself, but the kind of change brought forward. This statement is supported by the positive perceptions discussed earlier on where educators indicated the good things brought about by change. The negative perceptions mentioned shows educators' lack of ownership of change. Lovat and Smith, (1998) indicated that ownership ensured commitment by all those involved in implementing the change, therefore lack of it will not encourage educators to implement change. The findings also make one to wonder whether stage two and three of Hunkins's Decisionmaking model were fully covered. It appeared that in the process of identifying needs and the selection of content educators (Union representatives) were not actively involved. This attest to the comment by Hoadley and Jansen who posited that unions did not play an active role during the development of curriculum 2005 (2009). Again more confusion arise because complaints about the inappropriate choice of content are directed also at the recent policy change (CAPS), which, according to the minister, has been extensive and widely consultative (DBE, 2011).

The findings indicated implementation challenges. According to Hunkins'Decision making model this could be remedied by first piloting the curriculum to work out any minor problems in the programme. The rapid changes in the subject (it was changed every three years) could have prevented adequate piloting of the policy changes, hence implementation challenges surfaced. Educators complained about the shifting of topics−a process, which ended up in the selection of difficult topics for lower grades. One wonders about whether justice was made to the question why the curriculum must be changed (Blenkin, Edwards & Kelly, 1992). Evans (2004), who posited that in planning change, three understandings are to be made clear, also supports the authors namely, why is change necessary? what are we changing to? how will we get there? Since educators do not see "the real change" in the subject other than different approaches (e.g OBE) and shifting of topics within and between grades, the researcher became dubious to accept that those pertinent questions by Evans were fully addressed during the development of Life Sciences curriculum. It appeared that curriculum designers were unable to address the question, what are we changing to ? Therefore the question how will we get there will be a challenge for implementers of the policy.

Findings also indicated that stage 4 of Hunkins's Decision making model was not fully addressed. This includes planning for resources needed to make the innovation a success as well as planning for instruction strategies. Educators complained about the poor quality of textbooks and the introduction of new topics, namely evolution that they were unfamiliar with. The latter could be attributed to the notion that educators do not welcome change because they do not want to shift from their comfort zones. Unwillingness to be lifelong learners made educators to resist anything that needed them to change.

The rapid policy changes in the subject also led to poor evaluation of the policy. According to Hunkins's model the evaluation stage is conducted throughout the life of the curriculum. This

helps to provide data for decisions about continuing, modifying, or discontinuing the programme. Curriculum innovations in the subject are short lived and thus the researcher asserts that no proper evaluations of the policies existed. Not giving a particular programme enough time to run creates stress, confusion, and teachers complained about this. Educators felt they were not fully trained for the new programme because they only received training over the course of three days and, according to them, this was inadequate. They even complained that they remained a novice teacher forever because the constant changing of topics did not allow them to master the topics for a particular grade. This also correlates with what the researcher said earlier on, namely that educators do not want to leave their comfort zones.

CONCLUSION

Teachers' perceptions regarding the changes and implementation of a plethora of Life Sciences curriculum policies were discussed. From the findings, educators expressed positive outcomes of curriculum change as well as some form of resistance to the different policy changes. Resistance to change was caused by rapid changes which occurred within a short space of time as well as teachers' reluctance to leave their comfort zones. The researcher therefore recommends that policy change should not be drastic, but it should be given sometime to allow the beneficiaries (stakeholders in education) to enjoy the fruits of such change. Proper evaluation of a policy must be done before it can be phased out. For educators to complain about Life Sciences curriculum is a clear indication that they did not play an active role (Union rep) during the development of such a curriculum. The researcher recommends that teacher formations and all other stakeholders be allowed to participate in issues related to curriculum development. Adequate training and continuous in-service training should be key to any policy change for the policy to yield positive results.

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‘THEM AND US’: EXPLORING THE SOCIO-POLITICAL SUSTAINABILITY OF SOUTH AFRICAN UNIVERSITIES IN AN ERA OF ‘DANGEROUS’ STAKEHOLDERS

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Abstract
University-wide and protracted protests by #feesmustfall, #rhodesmustfall, and #decolonise-science and/or #decolonise-education movements collectively referred to as the *fallists* have put into question the socio-political and financial sustainability of South African universities. This concept paper revisits the idealistic definition of university and uses stakeholder theory, social strain theory, post-colonial theory, conflict theory and the culture turn to demonstrate how South African universities have shifted away from the founding principle of university-a utopian public institution than embraces the ‘whole’ of society. This theoretical framework explains the misunderstanding and mishandling of the protesting fallists as a deliberate act of protecting neo-liberalism and rampant global capitalist interests in South Africa. It concludes by presenting a new paradigm shift on what a university ought to be in an African context that is desperate for skilled labour to spur its socio-economic development.

Keywords: fallists, stakeholders, South African universities, theoretical framework, socio-political sustainability

INTRODUCTION

Countrywide and protracted protests that shut down universities by #feesmustfall, #rhodesmustfall, and #decolonise-science and/or #decolonise-education movements collectively referred to as the *fallists* have put into question the socio-political and financial sustainability of South African universities. Indeed, universities are public institutions that should serve the public good and are ultimately accountable to the people they serve. At least in the eyes of the fallists, universities have become elitist and ‘out of touch’ with the South African plight of the triple challenges of inequality, unemployment, and poverty. Traditionally, universities have been the hotbed of contestations and innovation. Sadly, South African universities seem to become, at least in the eyes of the ‘dangerous’ stakeholders, the anti-thesis of the model or ideal university. In turn, this has led to an invigoration and strengthening of the fallists’ resolve.

These three dimensions of society, politics, and money are the center of the confrontation between university management and students. South African universities risk losing their social status and political influence in society in a quest for safeguarding their purse and while delivering a much-needed public good that costs money. This concept paper revisits the idealistic definition of university and uses stakeholder theory, social strain theory, post-

colonial theory, conflict theory and the culture turn to demonstrate how South African universities have shifted away from the founding principle of university-a utopian public institution than embraces the 'whole' of society. This theoretical framework explains the misunderstanding and mishandling of the protesting fallists as a deliberate act of protecting neo-liberalism and rampant global capitalist interests in South Africa. In this regard, the ivory tower mentality of university stakeholders including management and government seem to perpetuate new managerialism, marketisation and privatisation of higher education, perhaps unwittingly, as part of the globalistic neoliberal agenda. The paper argues for a new paradigm or discourse on what a university ought to be in an African context that is desperate for skilled labour to spur its socio-economic development.

FALLISTS AS 'DANGEROUS STAKEHOLDERS'

Stakeholder theory explains how any organisation has to relate with both internal and external partners. Stakeholders at public universities can include staff (academic, managerial, and support), funders (government), donors (organisations and individuals), students, parents and guardians, and the surrounding communities. Stakeholder theory has evolved over many decades to include stakeholder classification typologies (see Table 1 below). Although they are common, these typologies highlighted in Table 1 are not exhaustive and are used for illustration purpose only.

Table 1: Stakeholder Classification Typology

Authors	Classification/criteria used
Goodpaster (1991)	The strategic and the moral stakeholder
Savage et al. (1991)	Stakeholder's potential to powers to threaten or cooperate with the organisation
Clarkson (1995)	The primary (with formal relationships) and the secondary (without formal relationships)
Mitchell et al. (1997)	Power, legitimacy, and urgency
Rowley (1997)	Network density and the centrality of the organisation focus
Scholes & Clutterbuck (1998)	Power of influence, impacts on the organisation and affinity with organisational objectives
Kamann (2007)	Power and level of interest
Fassin (2009)	Classical stakeholder, stakewatchers, stakekeepers

Source: Wagner Mainardes, Alves, & Raposo (2012).

These are the common stakeholder classification typologies in stakeholder literature. Definitions of stakeholders by Savage et al. (1991), Mitchell et al. (1997), Scholes & Clutterbuck (1998), and Kamann (2007) squarely fits the description of the *fallists*. They possess enormous amounts of power that led to the country-wide closure of South African universities. Their demand for a free and decolonised higher education is urgent-thus,

threating both the university and government establishments. The authors choose Mitchell et al. (1997 cited in Wagner et al. 2012: 1866)'s typology that qualifies the description of *fallists* as 'dangerous stakeholders' that has power and urgency but stripped of any legitimacy. This coercive stakeholder (and possibly violent) may represent a threat to the organisation (see Table 2 below).

Table 2: Authors' synthesis inspired by Wagner et al. (2012)

Stakeholder type	**Classification options**
Latent stakeholders (in possession of only one attribute, probably receiving little organisation attention)	*Dormant stakeholder*. Individuals and groups with the power to impose their wills on the organisation but lack either legitimacy or urgency. Hence, their power falls into disuse with little or no ongoing interaction with the organisation. Nevertheless, the management of the organisation needs to be aware and to monitor this stakeholder and evaluate its potential to take on a second factor. *Discretionary stakeholder*. Individuals and groups with legitimacy but lack both the power to influence the organisation and urgency. *Demanding stakeholder*. When the most important attribute is urgency. Without power or legitimacy, they do not demand greatly of the organisation but require monitoring as regards their potential to gain a second attribute.
Expectant stakeholders (in possession of two attributes resulting in a more active posture both from the stakeholder and the organisation)	***Dominant stakeholder***. Individuals and groups that hold influence over the organisation guaranteed by power and legitimacy (**University management, Department of Higher Education**) ***Dangerous stakeholder***. When there is power and urgency but stripped of any legitimacy. The coercive stakeholder (and possibly violent) may represent a threat to the organisation. This description is attributable to the **Fallists**. *Dependent stakeholder*. Individuals and groups that hold attributes of urgency and legitimacy but which however depend on another stakeholder for their claims to be taken into consideration.
Definitive stakeholder	**Whenever the stakeholder holds power, legitimacy and urgency with managers therefore paying immediate attention and prioritising this stakeholder**
Non-stakeholder	When individuals and groups neither hold any influence nor are influenced by organisational

operations

Source: Authors' own synthesis inspired by Wagner et al. (2012).

The *fallists* started off as *dormant and discretionary stakeholders* with the untapped power and legitimacy given to them by the students that elected them into the Student Representative Council (SRC)-a body that constitutionally mandated to represents the needs and interests of students at South African universities. SRCs are recognised by both the University management and the Department of Higher Education of South Africa as legitimate stakeholders at universities. SRCs gradually transformed into *demanding stakeholders* with untapped power (they could not yet organise student protests) and stripped legitimacy (since management did not listen to them) into *dangerous stakeholders*. Stripped of their legitimacy, these dangerous stakeholders unleashed their power by organising country-wide and protracted mass protests that demanded free and decolonised higher education now. A dangerous stakeholder has power and urgency but is stripped of legitimacy-meaning they cannot take meaning decision enforceable by law.

In the following paragraphs we use the social strain theory, post-colonial theory, conflict theory, and the culture-turn to clarify the rationale behind the *fallist* movement and why it caught momentum and threatened powerful institutions. We go further to expound on the feasibility of a decolonised higher education by invoking elements of Post-normal, mode-2, and sustainability sciences-as new knowledge generating sciences for a post-modern, anti-colonial, and anti-apartheid era.

THEORETICAL FRAMEWORK AND DISCUSSION

Social strain theory

Section 29 (1)(b) in the Bill of the Rights of the Constitution of the Republic of South Africa states that "everyone has the right to further education, which the state, through reasonable measures, must make it progressively available and accessible" (Republic of South Africa, 1996: 12) and these ideals should be operationalised through the National Development Plan Vision 2030 that recognises the need for increased funding for universities to improve access, success, and quality (National Planning Commission, 2011). Unfortunately, students from disadvantaged background continue to struggle with university fees despite this basic human right been enshrined in the constitution-the highest law of the land. It is not surprising that parents and guardians struggle to afford high university fees with unemployment at 26.5% in the fourth quarter of 2016 in South Africa (Statistics South Africa, 2016). Ultimately, these students are financially and academically excluded from universities and are unable to meet this basic need for further education. The South African society expects its youth to complete both primary and further education and contribute to the development of the country. However, young people from poor backgrounds enrolled at universities are unable to live up to these societal values resulting in what Robert Merton (1938) coined as "Social strain theory".

Merton (1938)'s social strain theory explains that any society has a set of dominant values and goals along acceptable means of achieving them. Not everyone is able to realise these goals. The gap between widely accepted values and the means people have to achieve them creates a social strain. These goals can be individual achievement (i.e. getting a university degree) in neo-liberal countries such as South Africa. However, the *fallists* have staged country-wide campus protests complaining about the lack of or limited financial means for achieving these societal goals and values. It is noteworthy that the *fallists* are not absconding from their duty of getting an education but they are fighting for better means of realising that goal for everyone-including the poor and the so called "missing middle". The missing middle are students from middle class background whose parents or guardians cannot afford university education but earn enough money not to qualify for government loan programme such as the National Student Financial Aid Scheme (NSFAS). The *fallists* have chosen rebellion which invokes the creation of a new society based on different goals and values. These goals include fighting for and realising a fees-free higher education espousing values of access and inclusion for poor students and the missing middle. Universities and government have responded to these calls with violent crack-downs on peaceful protesters by law enforcement agencies-who themselves are parents of the missing middle. Even today, a year later, universities and government are still struggling with funding for poor students and the missing middle, notwithstanding the additional five (5) billion Rands funding for 2017 to universities announced by the finance minister (Gordhan, 2017). This has eroded the trust of the *fallists* and their followers in public institutions including the universities, government, law enforcement agencies, and the judiciary. Such antagonist behaviour from public institutions has destroyed social and political relations between them and the *fallists*. Hence, future protest actions that threaten the sustainability of universities are likely to occur as prospects for poor students and missing middle seem gloomy and bleak.

Post-colonial theory (anti-colonial and anti-apartheid sentiments)

The term post-colonial theory explains the period after the collapse of the European colonial empires-British, French, Dutch, Spanish, Portuguese, Belgian, Italians, and German. Post-colonialism era in the context of African begins with the post-independence period starting with the liberation of Ghana from British colonial bondages between the 1950s and 1960s (Childs & Patrick Williams, 2014). However, due to the entrenched nature of colonial interests including culture, commerce, and institutions the post-independence period was quickly followed by a new form of neo-colonialism. Capitalism, globalisation, internationalisation, and marketisation are all tools for continued neo-colonialism-an indirect form of colonialism. The persistence of neo-colonialism through tenants of neo-liberalism is illustrated by Frantz Fanon in his book entitled *the Wretched of the Earth*. Fanon and Sartre (1963) argues that the mother country continues to exerts power and influence over the newly liberated African state through a variety of means including through the co-opted national bourgeois whose rank and file is filled by native Africans trained in European etiquette. The newly liberated African state has poor infrastructure and it is characteristic of a primary economy largely dependent on extractive and agrarian activities. In this setting, the former slave masters are replaced by the national bourgeois socialised in European culture. Those

that do not assimilate to European culture and accede to European needs are brutalised and executed. The assassination of heads of states including Thomas Sankara of Burkina Faso and Patrice Lumumba of the Democratic Republic of Congo (DRC) is undisputable evidence of the lengths neo-colonial champions would go to protect their interests on the African continent. Such acts of brutality and murder extended to South Africa,-which is the focus of this paper.

This system of brutal treatment of the native people of Africa was later adopted by the apartheid system of South Africa. This country suffered centuries of colonialism and decades of apartheid. The colonial masters and apartheid lords perfected a system that dehumanised native Africans opposed to these criminal systems. Colonialism and apartheid would late be declared crimes against humanity (United Nations, 1973). Apartheid lords legislated for the inhumane treatment of native Africans and built institutions to enforce its draconian laws. Such legislation and practices were designed to 'keep the natives in their place' by the sheer use of brutal force. Apartheid officially ended in 1994, but it would seem that legislations and practices of apartheid-era law enforcement agencies have inscribed themselves in post-apartheid institutions and attitudes.

Conflict theory

For many reasons, South Africa is experiencing unprecedented levels of public protests including university-based protests by students-collectively known as the *fallists*. The *fallists* have called on the government to provide fees-free and decolonised education to the poor and middle class students. Students, represented by the Student Representative Council (SRC), are important stakeholders in universities. Students are represented on any university's decision making bodies through their elected leaders serving in the SRCs. The SRCs advocate for the needs of students and owe their very existence to this constituency. Therefore, the needs of students should take center stage in the activities of any SRC-as was the case with the protracted protests against high university fees.

Other stakeholders, including university management, the department of higher education, private security personnel, and the South African Police Services (SAPS) responded to these students' needs with typical arrogance, brutality, and mistrust. This is because students, through their SRCs, are regarded as 'dangerous stakeholders' (Wagner et al. 2012). Such arrogance, brutality, and mistrust are characteristic of colonial- and apartheid-era law enforcement practices.

These 'dangerous' stakeholders are fighting the race and socio-economic class battle disguised as the #feesmustfall. The fault lines of this battle are deep and linked to political parties, social class, economic transformation, institutional racism, and race relations in South Africa. The omnipresence of prominent legal professionals from the opposition party and regalia of the ruling party within the #feesmustfall protesters is evidence of the vested interests of titanic proportions in the impacts and outcomes of these country-wide protests. University management together with these stakeholders has created an impression of

‘turning against’ the young *fallists* and protecting the dominant stakeholders even when they are accused of brutality against an unarmed and defenseless student populace. This police brutality revives bitter memories of the 16th June 1976 massacre of school children by apartheid law enforcement personnel (South African History Online, 2013).

Universities risk to be caught in between these fault-lines and appear as stooges of the neo-colonial and neo-apartheid masters. According to Fanon and Sartre (1963) these puppet roles are often assumed by political parties of the newly independent African state. Universities risks been painted with the same Fanonian brush. Ideally, universities should be independent from external influence including from its funding partners-the government. The *fallists* have called for and demanded radical changes in the manner universities conduct their business. They have even gone a step further and begun to question the dominance of Western science in knowledge generated for an African context. These sentiments are described by Ray and Sayer (1999) as the cultural turn in knowledge generation and development.

Cultural turn theory

A video on YouTube captured the attention of South Africans and invited fierce critiques and supporter alike. This video shows a young lady at one of the prominent South African universities questioning the relevance applicability of Western science in an African context. (Available at: https://www.youtube.com/watch?v=C9SiRNibD14). European settlers used centuries of colonialism and decades of apartheid to “inscribe itself onto the body and space of Others” (Childs & Patrick Williams, 2014; 4) through the systematic destruction of native culture and ‘civilising’ of the ‘barbaric tribes’. Gradually, this led to a dominance of Western culture over ‘Other’ cultures-leading to a cultural hegemony (Robinson, 2004; Sneddon, Howarth & Norgaard, 2006). This hegemony continues to dominate knowledge generation and socio-economic development on the African continent. Universities continue to perpetuate this cultural hegemony in the ways they teach, research, and engage with stakeholders including with the *fallists*. In retaliation, the *fallists*, particularly those based at the University of Cape Town (a quintessential white university) have staged protests including the successful removal of Cecil John Rhodes (the notorious coloniser) from the public grounds of the university. The fact the University of Cape Town (UCT) proudly displayed a monument of a colonial master is evidence of the omnipresence of the cultural hegemony of the West. The retaliation of UCT students, both Black and White, against symbols of colonialism and apartheid is typical of a cultural turn. These *fallists* were calling on the UCT management to disassociate itself and the university from colonial and apartheid-era symbols and attitudes as a first step towards decolonisation. Indeed, post-colonial era describes a period in which colonial empires in Africa fell but it also addressed issues of colonial continuation in neo-colonialism and the negative cultural production (Childs & Patrick Williams, 2014) of the West. Cultural production is a key concern for the #rhodesmustfall or the UCT *fallists* as captured by sentiments in this YouTube video clip. Western culture is deeply inscribed in African society and it has become the ‘way of doing everything that matters’.

Universities, including UCT, have been slow to respond to the concerns of the *fallists*. Instead, they responded by inviting riot police onto campuses to 'maintain public order'. But, as is always the case, the presence of riot police leads to violent conflicts and confrontations between law enforcement officers and protesters. Inviting riot police onto university campuses is typical of a dictatorial regime seeking self-preservation or capitalist establishments protecting themselves from victims they disenfranchised. The collapse of North American banking institutions and subsequent Eurozone crisis had the hands of law enforcement officers full as they struggled to protect the banking establishment against angry customers. The role of the government law enforcement agencies should have been to protect the customers of the banks (like in the case of Iceland) from the reckless speculation of bankers that set forth the global financial meltdown. UCT has acted in the same manner by projecting and protecting symbols of a long gone colonial- and apartheid-era at the expense of its major stakeholder-the student population.

Over and above, the student in the video was correct to point out that "Western modernity is the direct antagonistic factor towards decolonisation" and that Western science is "totalising". Western science is reductionist, individualistic, 'superior', decontextualised (dead/disembedded knowledge), mechanical (codified knowledge stored in books and websites), and theorectical and so forth. Western science has been the singular way of generating knowledge and directing development for colonial mother countries and their colonies. Western science and culture continues to dominate knowledge generation and guide development in post-colonial and post-apartheid countries. This is despite the fact that the native people of these countries possess Indigenous knowledge which is the direct opposite of Western knowledge. Indigenous knowledge is contexualised (placed-based), its practical (derived from interaction with the environment), pluralistic, and holistic etc. (Van Opstal & Hugé, 2013). The integration of Western science and indigenous knowledge offer great synergies for dealing with wicked problems (Rittel & Webber, 1973) such as crime, climate change, unemployment, inequality, poverty, desertification, and drought and so forth. However, the dominance of Western science and culture over 'Other' cultures denies society of holistic solutions to challenges we face. Universities can play a huge role in the integration of Western science and Indigenous knowledge as centres for teaching, learning, and research. Studies already exists in the environmental sciences particularly in the field of climate change in which Western science and Indigenous knowledge are complementing each other in climate monitoring, coping, adaptation, and mitigation (Codjoe et al. 2014, Nkomwa, 2014; Egeru 2012; Mengistu, 2011; Green & Raygorodetsky, 2010; Orlove et al. 2010; Speranza et al. 2010; Lema & Majule, 2009; Nyong et al. 2007). This approach to scientific inquiry is part of post-modernity's recognition of the limitations inherent in a single worldview but embraces multiple realities. These realities can include Africa, both North and South, Asia, the Americas, the Middle East, and the Pacific and so forth. Each of these regions has rich cultural diversity that shape the manner in which they generate and relate to knowledge and direct development. New sciences have emerged from these multiple worldviews that acknowledges that knowledge is generated in different methods and in varying contexts-these

sustainability sciences (Van Opstal & Hugé, 2013) are Post-Normal and Mode-2 sciences (Van Opstal & Hugé, 2013), and they offer great opportunities to "decolonise science".

CONCLUSION

Universities ought to embrace peaceful protests as they are protected and legislated for by the Section 17 in the Bill of Rights which states that "everyone has the right, peacefully and unarmed, to assemble, to demonstrate, to picket and to present petitions" (Republic of South Africa, 1996: 8). Historically, universities have always been the hotbeds for innovation and testing of new ideas that lead to scientific and cultural breakthroughs. Universities should pursue avenues that exist for redressing cultural hegemony in the areas of knowledge generation and the direction or socio-economic development. Environmental management, particularly, climate change and development offers post-colonial societies an opportunity of reconciling Indigenous knowledge and Western science in pursuit of context-specific solutions to African development challenges. These sciences are Post-Normal and Mode-2 sciences (Van Opstal & Hugé, 2013), and they offer great opportunities to "decolonise science".

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EXAMINING THE EXTENT TO WHICH MOBILE BULLY-VICTIM BEHAVIOUR IN SOUTH AFRICAN HIGH SCHOOLS IS A CONSEQUENCE OF AGGRESSIVE BEHAVIOUR OR SOCIAL INTEGRATION

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Abstract
Bully-victims are children who are both victims and perpetrators of bullying. These children tend to have high levels of depression, aggression and they are chronic targets of victimization. Research on bully-victims in South Africa is limited. At the moment, majority of studies focus on the effects and frequency of bullying and victimization. The actual causes of victimization and bullying have not been well established. Many studies attribute them to aggressive behaviour although there is also evidence to suggest that bullying results from social integration. This paper aims to investigate the potential causes of bully-victim behaviour in order to provide better understanding of this phenomenon. This knowledge can be used by anti-bullying policy makers at schools to develop better interventions and more legal binding policies. An extensive review of literature on social integration and aggression as contributors to aggression was conducted. A model for the potential causes of mobile bully-victim behaviour is proposed to guide further research.

1. Introduction

Bully-victims were first studies in 1978 by Olweus (Schwartz, 2000). Bully-victims are victims who end up resorting to aggressive strategies to deal with victimization (Juvonen & Graham, 2014). They may not be many in number but they present serious risks and calls have been made for more empirical research on this category of bullies (Unnever, 2005; Kabiawu & Kyobe, 2015). Currently there is limited literature on bully-victims behaviour (Kabiawu & Kyobe, 2015). In addition, there are inconsistences on whether this behaviour is a result of social integration or aggressive behaviour (Cuadrado-Gordillo & Fernández-Antelo, 2016). Understanding the real causes of bully-victim behaviour would help in developing proper intervention programs (Wright & Li, 2013; Kabiawu & Kyobe, 2015; van Dijk et al., 2017).

2. Literature

The research is divided into four sections. The first section will explain what cyberbullying is and subcategories will be listed including mobile bullying. The second section will explain bully-victims characteristics. The third section explains bully-victim behaviour as a result of

aggressive behaviour using the general aggression model. The last section will explain mobile bully-victims behaviour as a result of social integration.

2.1. Mobile bullying as a subcategory of cyberbullying.

Cyberbullying is an aggressive behaviour expressed towards another individual with an intention to harm/distress the victim (Whittaker & Kowalski, 2015). Cyberbullying can be conducted through electronic communication media such as computers and cell phones (Smit et al., 2006). In addition, cyberbullying is repetitive and usually occurs when there is imbalance in power between the perpetrator of bullying and the victim (Whittaker & Kowalski, 2015). There are subcategories of cyberbullying such as text message bullying, mobile bullying, chat room bully and email bullying. Previous studies have recommend future studies to investigate these subcategories in order to get a richer understanding of the subject (Smit et al., 2006). Hence, this study examines bully-victim behaviour on a mobile social networks.

2.2. Characteristics of bully-victims

Bully-victims are not only special because they have high problematic behavioural issues compared to bullies. They have also been found to show no remorse to those they bully (Ragatz et al., 2011). Mobile bully-victims are both bullies and victims (Ball et al., 2008). Bully-victims are characterized by having higher levels of both emotional and behavioural issues. Bully-victims usually have higher levels of depression, anxiety and attention deficit reactivity disorder (Ragatz et al., 2011). According to Ball et al. (2008) males who grew up in hostile homes watching and experiencing aggressive behaviour are likely to become bully-victims. It was noted that children also become bully-victims mostly because of genetic factors (Ball et al., 2008).

Researchers also report that bully-victims have high levels of low self-control and tend to engage in anti-social and problematic activities (Ragatz et al., 2011). Bully-victims also think they have limited control of what happens around them, which explains why they are victimized at times. They are more likely to accept aggressive behaviour compared to victims and they isolate themselves from other normal adolescents, which may increase the chances of them being victims of bullying (Ragatz et al., 2011). Both online and offline bully-victims tends to have high levels of both reactive and proactive aggression styles (Ragatz et al., 2011). Proactive aggression is planned by the perpetrator of bullying in order to achieve/gain something, while reactive aggression is a result of others' actions/behaviour (Burton et al,. 2013).

3. Bully-victim behaviour as a result of aggression.

In this section we explain how aggression leads to bully-victim behaviour. Individual factors, and demographic factors are discussed.

3.1. Individual factors that cause aggression

This section presents some of the individual factors that contribute to the aggressive behaviour of bully-victims.

i) **Low self-esteem:** Self-esteem is an individual belief regarding personal value (Patchin & Hinduja, 2010). As indicated above, bully-victims have been found to have very low self-esteem compared to both victims and bullies (Bayraktar et al., 2015). The cause of this may be attributed to previous experience of being bullied, which leads to a decrease in self-esteem (Patchin & Hinduja, 2010). Over time, adolescents who have been bullied several times develop aggressive behaviour (van Dijk et al., 2017). This aggression is motivated by reactive reasons such as anger (van Dijk et al., 2017).

ii) Low self-control: Self-control refers to one's ability to control emotions and thoughts (Inzlicht et al., 2014). Bully-victims are characterised by high levels of low self-esteem and they are hot-tempered (Bayraktar et al., 2015). The inability to control anger decreases self-control and results in aggression. This means aggressive behaviour on bully-victims is a result of depleted self-control.

3.2. Demographic factors

i) **Age:** Age is defined as the time an individual has lived (*Merriam-Webster's collegiate dictionary*, 1999). Aggressive preschoolers are likely to be bully-victims because as they transition from primary to high school, they are likely to be victims (Jansen et al., 2011). These children start as minor aggressors who steal and bully others. As these children grow older, they become more problematic in terms of their hostile behaviour (Jansen et al., 2011). According to Hanish et al. (2004), bully-victims become more strategic aggressors, as they grow older, this makes them to bully others more in order to decrease their level of victimization.

ii) **Gender:** Gender is defined as a state of being either a male or a female lived (*Merriam-Webster's collegiate dictionary*, 1999). According to Berkowitz and Benbenishty (2011) male adolescents are more likely to be bully-victims than females because they engage more in physical aggression compared to females. As male bully-victims socialise with aggressive peers, they could become victimized. This is the case for traditional bully-victims. However when it comes to cyberbullying, females are said to be bully-victims more than males as they use the technology to

covet their behaviour (Cuadrado-Gordillo & Fernández-Antelo, 2016). Other studies have found both males and females equally likely to be bully-victims (Bayraktar et al., 2015).

iii) **Environment/location:** Location is defined as a specific place (*Merriam-Webster's collegiate dictionary*, 1999). In this case, it is a specific place where a bully-victim lives/ grew up in. The environment and location are also factors that lead to bully-victim behaviour (Hanish & Guerra, 2004). Examples of these include being exposed to violence at home and at school, which results in a stressful environment that makes children feel insecure (Hanish & Guerra, 2004) Adolescents who have been exposed to such environments end up mimicking the aggressive behaviour to their peers. Violence within the community where the bully-victim is from has been acknowledged to have an influence in bully-victim behaviour (Hanish & Guerra, 2004).

4. Social integration as a cause of bully victim behaviour

In this section, how social integration leads to bully-victim behaviour will be explained using relational and social integration theories.

4.1. Relational factors

i) **Popularity:** Popularity is a state of being admired by others (*Merriam-Webster's collegiate dictionary*, 1999)**.** Popularity is a mixture of prosocial and aggressive behaviour within a social network (Cillessen, 2011). Popularity in a peer group is about prestige and being more noticeable. Which is why adolescents when they nominate an individual who is popular only consider who is mostly visible in school or class and at the same time the selected individual is regarded at holding a high status (de Bruyn et al., 2010). According to the theory of popularity, being more visible within a peer group is objective while prestige is subjective. For example, popularity that is obtained through being more visible to peers within a network **(**Cillessen, 2011). Prestige on the other hand is caused by dominant behaviour that are shown by the popular adolescent within a group **(**de Bruyn et al., 2010). The dominant behaviour include relational aggression that is used by the popular individuals to other peers within a social network. The reason for using aggression is for maintaining popularity **(**Cillessen, 2011).

Popularity has effects, and one of the effects is the influence the popular adolescents have within a network. According to the popularity theory, popularity effects come with risks because popularity is a limited social resource so others also want to be popular. The scarcity for popularity also increases the competition (Dumas et al., 2017). As a result adolescent who are popular do not only reap the rewards of being

influential but also inherit the risk of others influencing them by using aggressive behaviour in order to dominate them and move up to being more visible in the social network **(**Cillessen, 2011).

ii) **Power and network power theory:** Power can be define in terms of both influence and psychological change. In general terms, change involves a change in attitude, behaviour, needs and goals (French et al., 1959). Power change takes place within a system or a social network. General change and psychological change differ because psychological change in a social network is defined in terms of psychological forces (Vaillancourt et al., 2003). For change to take place, it must be aligned to the forces that derive psychological change (Fiske & Berdahl, 2007). For example to change an opinion of someone, a force has to be exerted successfully to the person being persuaded by the person who owns power within a social network (French et al., 1959). The force has to successfully secure the opinion of the personnel with power. The need to successfully persuade another person within a social network arises from the needs of the person with power. Those needs include security and maintenance of power (Vaillancourt et al., 2003).

Influence is an outcome of the psychological force exerted by the person with power within a social network. According to the network theory of power, power is exercised within a social network (Castels, 2011). Meaning, within a group in a community or on electronic social media (Ellison et al., 2014). The actors of the network possess power because of resources they have such as physical appearance, having knowledge, being intelligent and having a social status, this type of power is called implicit power (Agnew, 1999). Implicit power is gained by being successful at influencing others within a social network with the implicit resources the individual has according to the definition of power (Fiske & Berdahl, 2007). Power is abused by the influential individual with power by influencing others to do what they would not do (Fiske & Berdahl, 2007).

According to the network theory, individuals tend to compete for power because it is a scarce resource (Castels, 2011). This competition results in rivals of the individuals who already have power within the network. The rivals aim to oppose the individual who already has power so as to gain the power (Castels, 2011). Opposing the individual involves using aggression in order to make the individual with power, give away their power or to no longer look powerful (Adams, 1975).

iii) **Peer rejection and social integration theory:** The theory of social integration looks at people as beings whose lives are shaped by both nature and social interactions (Rose et al., 2014). According to the social integration theory low psychological well-being is a result of not having strong bonds with other (Berkman et al., 2000). On the other hand strong bonds results in strong psychological well-being (Rose et al., 2014). According to the social integration theory, the stronger the bonds within a social

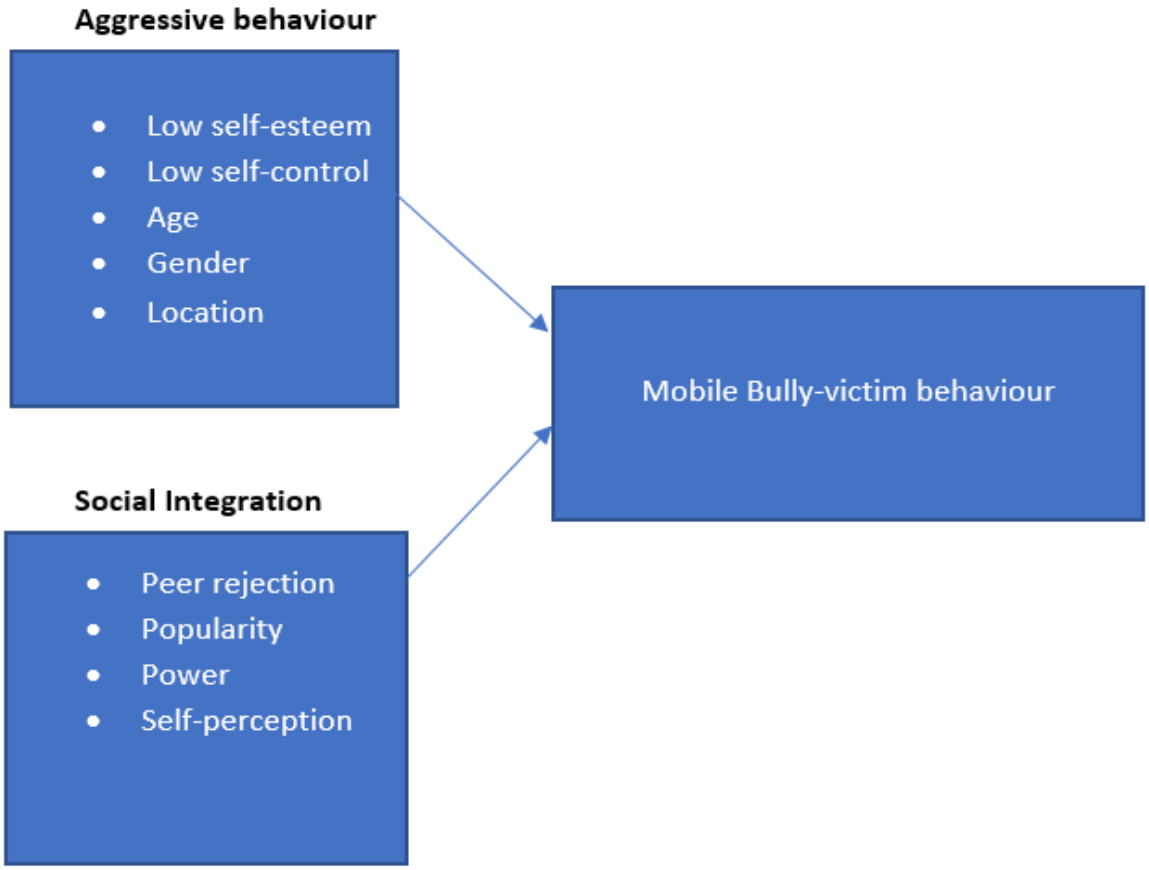
group, the more the members will conform to the norms of that particular group. The reason to conform is to sustain the bond. The person interested in a group, characterized by strong bond is under pressure to impress the members of the group in order to attract them. The reason for this is because acceptance to a group intensely dependent on attraction. Being attracted to a group does not mean the members of that group are also attracted to the individual (Berkman et al., 2000). Therefore, attraction gives an individual a goal to work on. The competition rises between individuals who want to be part of a specific group and to recruit allies. The competition becomes unhealthy and it blocks social integration because as competition for social resources such as peers and allies increases, adolescents become encouraged to use aggression to impress the group of peers they are attracted to (Pellegrini et al., 1999). As a result, other adolescents become bullies. Bully-victims oppose this strategy for obtaining allies since they become marginalized by bullies, to show their opposition they use reactive aggression as a retaliatory protective response to being victimized (Pellegrini et al., 1999). Being extremely aggressive becomes unattractive to other peers and it results in peer rejection (Bayraktar et al., 2015). Rejection happens when someone/a group refuses to accept another individual. In this case the peers (*Merriam-Webster's collegiate dictionary*, 1999). This rejection act as a source of strain that leads to relational aggressive behaviour. Relational aggression in this case is a coping strategy for the bully-victim. Bully-victims tend to use this strategy to execute revenge to peers (Wright & Li, 2013). Bully-victims invite further victimization by reacting aggressively to bullies and they end up being chronic of victimization since they have no friends to protect them (Dulmus et al., 2006)

iv) **Self-perception**: Self-perception are beliefs that a person has about themselves. These include physical appearance, intellectual, emotional and social components. According to Kaloyirou and Lindsay (2008) examining the self-perceptions of those involved in bullying would help teachers, parents and psychologists understand bullying better. Examples of the self-perception include adolescents seeing themselves being powerful at school. This self-perception is asserted by being competitive within a social networks. According to the self-perception theory this final constructed self-perception is built from previous behaviour and the context where this behaviour was revealed act as an outside world (Ross & Shulman, 1973). According to Kaloyirou and Lindsay (2008), when bullies provoke victims within a social network, previous studies noted that victims tend to react aggressively because they perceive a threat to their existing constructed self-perception. In this case, the adolescent being provoked is a victim. Hostility that is used by the victim act as a strategy to maintain their self-perception. This is how a victim turns out to be a bully, through using hostility to protect their self-perception from the bullies.

5. Conceptual Model

Figure 1 represents the proposed conceptual model. The model was constructed based on the literature review that has been collected so far. This model includes both the social integration and aggression as the factors influencing mobile bully-victim behaviour.

Figure 1: Proposed Conceptual model for the causes of mobile bully-victim behaviour.



The figure above represents the potential causes of mobile bully-victim behaviour. The independent factors include aggressive behavioural factors and factors related to social integration. Mobile bully-victim behaviour is the dependent variable.

Conclusion

This study reviewed the literature to identify the potential causes of mobile bully-victim behaviour. Factors such as individual factors and demographic factors were examined together with those resulting from social integration. The literature review confirms that both social integration and aggressive behaviour can influence mobile bully-victim behavior. The study emphasizes the important of studying these factors together and not in isolation as has been done in some previous studies. The current conceptual model will be validated in a

future study to determine which of these two factors has the greatest influence on Mobile bully-victim behavior. This model can be useful to psychologists, teachers and school governing bodies as they try to understand the nature and causes of mobile bully-victim behavior, and also come up with appropriate intervention programs.

Limitations

There could be other influencing factors not considered in this model. Bullying is a complex problem that may require examination of many other factors, processes in the development of the student and the way they respond to this aggression. The study should therefore be extended to accommodate these other factors.

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ARE ACCOUNTING ACADEMICS EQUIPPED TO HEED THE CALL TO DECOLONISE ACCOUNTING CURRICULUM?

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Abstract
South African institutions of higher learning are colonial outposts that create and disseminate largely Eurocentric and "Global" knowledge. The call to decolonise higher education has been ongoing since the turn of democracy in South Africa. The call intensified when students from the #FeesMustFall movement brought forward the debate to decolonise institutions of higher learning and the curriculum in 2015. Some scholars believe that decolonising the curriculum is the inclusion of Indigenous Knowledge in current curricula. Whilst others believe it is reimagining the curriculum to bring previously-silenced voices to the centre of the curriculum. Regardless of the approach taken, academics are expected to understand theories around curriculum development in addition to subject-specific research. The current university accounting curriculum is prescribed by the South African Institute of Chartered Accountants (SAICA) with little interrogation by university academics. This paper stems from a curiosity of whether accounting academics have the skills required to heed the call to decolonise the accounting curriculum. We consulted literature to identify key skills and traits required by an academic undertaking curriculum development, and more specifically decolonised curriculum development. Based on the consulted research, a benchmark was developed against which accounting academics from SAICA-accredited universities were evaluated to assess whether they possess the qualities and skills that will enable them to develop a decolonised curriculum. We found that accounting academics do not have the required skills, namely research skills, curriculum development skills and indigenous knowledge.

Keywords: Accounting Education, Decolonised Curriculum, Research Knowledge

INTRODUCTION

The call to decolonise higher education has been ongoing since the introduction of democracy in South Africa. However in 2015, through the #FeesMustFall Movement, South African students intensified their call to decolonise the curriculum in institutions of higher learning. This intensified call is in light of their belief that the curriculum in South Africa, as it stood, was dominated by dead white men (McKeiser, 2016). Shay (2016) and Molefe (2016) concur with the students that the current curriculum at institutions of higher learning is dominated by western, male, white and Eurocentric views. Heleta (2016) adds that the current higher education curriculum still portrays African thought in a manner that is stereotypical and patronising.

South African universities have had strong ties with the South African Institute of Chartered Accountants (SAICA) since the 1920's. This is because universities are accredited by the SAICA to provide initial training for prospective accountants. The SAICA prescribes a syllabus for the universities and tests the students through its Initial Test of Competence (ITC). Schools of accounting, in turn, focus their curriculum in making sure that students are

ready to sit and pass the ITC (Venter & De Villers, 2014; Verhoef & Samkin, 2017). The SAICA's prescribed syllabus is focused on global trends to ensure that South African accountants are favoured in the global accounting fraternity.

When debating whether mathematics, a hard science, can be decolonised; Brodie (2016) argues that the curriculum content in mathematics may not need to change as much as it would in a social science like Anthropology, for example. However issues of accessibility, relevance and contextualisation are legitimate and must be addressed. Accounting is governed by international laws, regulations and International Financial Reporting Standards (IFRS). Although accounting is used in a global setting, it is important for universities to match these international trends to local knowledge (Negash, 2013). In light of globalisation, these international laws, regulations and standards form a large part of the South African accounting curriculum. There is little documented evidence on whether the content, accessibility, relevance and contextualization of the South African accounting curriculum has been interrogated.

The aim of the study was to determine if South African accounting academics have the skills required to decolonise the accounting curriculum in response to the social call made by the #FeesMustFall movement. Although a thorough interrogation of whether accounting can be decolonised is necessary and acknowledged, we do not aim to do so in this paper.

Literature was reviewed in order to identify elements that enable academics to develop curriculum and thus decolonise it. Using university websites, we obtained further evidence on whether South African accounting academics in various schools of accounting in the country possess the skills required to heed the call to decolinise curriculum. In this study, the school of accounting refers to departments of accounting, auditing, financial management and taxation as these are the four subjects that students study before sitting for professional exams (Samkin & Schneider, 2014). We selected, through purposive sampling, four SAICA-accredited universities that have full disclosure of their academic staff's education, professional qualification and research activity available on their websites. The use of websites as a form of collecting data has become prevalent and the latest such example is Samkin and Schneider (2014) using university websites to collect biographical and education information of accounting academics in Australia, New Zealand and South Africa.

SOUTH AFRICAN ACCOUNTING ACADEMICS

There are a number of other recognised accounting professional bodies in South Africa such as SAICA, UK-based Association of Chartered Certified Accountants, UK-based Chartered Institute of Management Accountants and South Africa's South African Institute of Professional Accountants. Although these other programmes are taught, the SAICA programme dominates managerial thinking in accounting departments (Venter & de Villers 2013). The SAICA is the leading and most recognised body of professional accountants in South Africa, it also has international recognitions.

The teaching of accounting in universities dates back to 1918 following the development of the Transvaal Society of Accountants in 1914. The society requested the University of Pretoria to teach accounting in a new B Com degree. Further, to incentivise universities to teach accounting in the Transvaal, the society made financial contributions to the University

of Pretoria and the University of the Witwatersrand (Verhoef & Simkin, 2017). Several societies similar to the Transvaal Society of Accountants were formed in the other three provinces of South Africa. By 1921 these four provincial societies formed a joint body, now known as the SAICA, to administer uniform enrolments and examination of prospective accountants (Kritzinger, 1991).

In the 1950s the universities provided the necessary prescribed intermediary education of prospective chartered accountants and the professional body focused on the Final Qualifying Examination (Verhoef, 2013; Venter & de Villers, 2013). This is still the case as the SAICA prescribes syllabi to be taught at Universities and the role of the University is to train its students to pass the examination and not create accounting knowledge (Verhoef & Samkin, 2017). This is not new, between 1951 and 1971 the Public Accountants' and Auditors' Board noticed that the academy made little progress in developing accounting as an academic discipline (Verhoef & Samkin, 2017).

Venter and de Villiers (2013) note that professional bodies colonise adjacent bodies, in this case the academe, to secure their status. This sentiment is echoed by Samkin and Scheneider (2014) and Verhoef and Samkin (2017) mentioning that the role played by SAICA in the academe has not be to the benefit of the progression of accounting as a discipline in South Africa. Even in the turn of the new democracy, accounting education still had its focus on training more chartered accountants and increasing the number of black accountants instead of interrogating the appropriateness of the curriculum.

The South African accounting profession ranks among the best within developed economies (Verhoef & Samkin, 2017). This is due to accounting academics' commitment to teaching high standard technical knowledge. However, the culture of research has not been sufficiently developed among accounting academics in South Africa. They are ranked among the least productive in South African Universities and similar academics in countries such as Australia and New Zealand (Samkin & Schneider, 2014). This is even with academics that have a similar teaching load (Watson, 2010). A large proportion of accounting academics in the UK, Australia and New Zealand have Masters and PhD degrees and this is not the case for South African accounting academics. This has had an impact on the research muscle required to create knowledge in the academe (Venter & de Villiers, 2013; Lubbe, 2014).

The research inactivity of South African accounting academics has had an impact on moving accounting academe forward since the 1950's. With the SAICA prescribing and having great autonomy on the syllabus this has led to further disengagement by the academics. They have, in turn, turned to knowledge agents (Lubbe, 2014) instead of actively participating in creating knowledge.

DECOLONISING UNIVERSITY CURRICULUM

Curriculum is the subject matter that is to be taught, it is what is worth knowing and consequently what needs to be taught (Ross, 2000; Adagale, 2015), and to date what has been taught is colonised knowledge. Le Grange (2004) refers to curriculum as knowledge that is included or excluded in university teaching and learning programmes. Indigenous knowledge has been, and is still, excluded in most fields and the call to decolonise the curriculum calls

for its inclusion. Curriculum can be changed in response to a stimulus, in this case we identify the stimulus as the social call to decolonise education (Slonimsky & Shalem, 2004). As applied to universities, responsiveness means "meeting society's broad expectations that higher education will adapt to change and contribute to national needs," (Ogude, Nel, & Oosthuizen, 2005).

South African higher education curriculum is legislated by the National Qualifications Act 2008 (Act 67 of 2008), Higher Education Act 1997 (Act 101 of 1997), Higher Education Amendment Act (Act 39). The purpose of the NQF is to align curriculum with work place requirements with the skills transferred to students through the curriculum in higher education (Ensor, 2004). According to SAQA a qualification is a combination of learning outcomes which have a defined purpose, which is intended to provide learners with a competency or skills in line with a profession (Nkomo, 2000). Some higher education qualifications in South Africa are aligned with professional bodies which outline minimum competency skills and knowledge required in the workplace. For example, the Engineering Council of South Africa, the Health Professions Council of South Africa, South African Nursing Council and the South African Council for Social Service Professions (Leibowitz, Bozalek, Garraway, Herman, Jawitz, Muhuro, Ndebele, Quinn, van Schalkwyk, Vorster, & Winberg, 2017). In the case of accountants this alignment is provided by SAICA.

Decolonisation of the curriculum is a process that includes reclaiming, rethinking, reconstituting, rewriting and validating indigenous and African knowledge (Emeagwali, 2014). It is also a process of ending whiteness - a symbol of purity, civilisation and modernity – in South African universities (Sandar, 2008). Heleta (2016) offers two approaches to decolonising the curriculum. The first would be incorporating South African, African and other global knowledge in the curriculum. He believes that this approach is a tick-box exercise that promotes the views of those that want to keep colonial and apartheid view. Pillay (2015) concurs with Heleta (2016) and further adds that this approach would lead to settling for a adding African concepts and context to existing curriculum.

The second approach is reconstructing the curriculum. This reconstruction includes rejecting that Western views are the only way of knowing. A curriculum that promotes a single-sided view does not develop students' critical and analytical skills (Heleta, 2016). Decolonised curriculum will not neglect other knowledge systems and global context (Department of Education 2008). The second approach seems to be favored, however requires the skills to design and develop a curriculum.

Academics are expected, through research, to own the knowledge they disseminate to their students and therefore inspire life-long learning in students instead of training them for specific jobs. Academics are thus to play a pivotal role in curriculum development. The task of curriculum development is very important and one needs to have the requisite skills and knowledge. duToit (2011) believes that academics without curriculum development skills might be considered incompetent.

It is from this that we believe that the skills required for developing a decolonised curriculum are:

1. Knowledge of indigenous knowledge;
2. Research; and
3. Curriculum development skills.

Indigenous knowledge

The South African institutions of higher learning have excluded indigenous knowledge for a very long and this has been left unchallenged (Le Grange, 2016). Letseka (2013) argues that indigenous knowledge should be integrated into curricula, and that curriculum material should reflect the social realities of the communities in which the universities operate. We are of the view that indigenous knowledge cannot be integrated into curriculum that is conceived through a Western worldview, (Moore-Garcia, 2014). It therefore cannot be integrated into existing curriculum, new curriculum must be developed and this requires academic to have indigenous knowledge or acquire it through research of such.

Simply put, indigenous knowledge is knowledge of a particular people, in a specific area that includes knowledge from sciences, the agriculture, the ecology, spirituality and works of art, among others (Battiste, 2005). In the case of accounting research into how pre-colonial inhabitants of Africa accounted for the trade of goods would need to be done. The challenge, however, "for the recognition of Indigenous knowledge in university teaching and learning is that non-Indigenous academics, often control the parameters of the embedding process" (McLaughlin & Whatman, 2008). We identify that employment of indigenous people in university structures as academics and non-academics as a key factor in imbedding indigenous knowledge in curriculum (Gunstone, 2008).

For indigenous knowledge to be prioritised in curriculum, it must be accompanied by increased the levels of indigenous staff participation in tertiary governance and greater indigenous representation in a wide range of academic governance roles, (Butler & Young 2009). In the context of South Africa these positions would include head of departments and programme heads, however universities have failed to substantially increase black academic staff, (Heleta, 2016).

The oxford dictionary defines indigenous people as those individual that have historical ties to a particular territory pre-colonial times. We adopt this definition for the purpose of the study, which excludes White and Indian South Africans. Although the process of knowledge production for curriculum transformation should be an inclusive process, we however believe that indigenous academics should lead this process (Shizha, 2013).

Research

In the process of curriculum development individuals involved in the process are required to investigate the nature of the qualification for which the curriculum must be developed, and match the curriculum to the qualification. Clements (2007) proposes a framework for research-based curriculum and argues that research provides a scientific base for curriculum development. Although he refers to the field of mathematics, he identifies a key feature of curriculum research, this research studies what could be in term of curriculum. Curriculum development requires lectures to draw from existing research, at each phase of the curriculum development process (Clements, 2002).

In general, South African academics have been faced with higher workloads as student's intake increase, alongside pressure to do both teaching and research (Leibowitz et.al., 2017). High student to lecture ratio have put lectures under pressure leaving them very little time to respond to the need to improve their qualifications and publish in accredited journals (Leibowitz et.al., 2017). In general, entry-level academics possess a master degree and this allows them to carry through independent research (Evans, Donald, & Nice 2000).

Curriculum development

Curriculum development is a broad concept that includes standard setting, learning programme development and delivery (Nkomo, 2000). Lecturers are the centre of curriculum development, and curriculum change but they require development in this area of skill, (Barthand Rieckmann 2012). To gain these skills they would have to go through training and development, a postgraduate degree in higher education would equip the lectures with adequate skills for curriculum development and teaching in higher education, (Vorster & Quinn, 2012). It is unfortunate that in South Africa a majority of university lecturers possess disciplinary qualification and knowledge and are not trained in the art of teaching (Maphosa, Mudzielwana, & Netshifhefhe, 2014; Leibowitz et.al., 2017).

Leibowitz et.al (2017) mention that South African academic staff have been required to learn on-the-job from day one, often without guidance, mentoring or support; which in turn implies that lectures do not necessarily possess the skills required to perform some of their duties. Earlier in the paper we mention that lecturers who do not possess curriculum development skill are considered incompetent and should not be part of the process to develop curricula.

INITIAL OBSERVATIONS

After identifying the skills required we selected four SAICA-accredited universities that had disclosed information on their academic staff members' professional and academic qualifications and their research activity in the past five years on their websites. The purpose of this exercise is to observe whether accounting academics have these required skills to embark on a journey towards a decolonised accounting curriculum.

We identified accounting academics with the CA (SA) qualification as having specialised disciplinary knowledge and experience. From our data collection on average 75% of school of accounting staff had qualified as Chartered Accountants (South Africa). This is in line with the SAICA's requirement to have staff members that are qualified as CAs (SA) teach students in the CA-programme (Venter & de Villers, 2014).

Table 1: Academic staff with CA (SA) qualification

	U1		**U2**		**U3**		**U4**	
Total (school academic staff)	87		18		21		20	
CA(SA)	62	71%	14	78%	13	62%	18	90%

Staff complement

We argued earlier that in order to decolonise the curriculum indigenous knowledge should be central in the process. McLaughlin and Whatman (2008) and Owour (2008) have argued that the dominance of non-indigenous staff members hinders the decolonisation process, we further defined indigenous people as individuals with pre-colonial ties to South Africa. Table 2 summarises academic staff by race.

Table 2: Academic staff by race

	U1		**U2**		**U3**		**U4**	
Total (school academic staff)	87		18		21		20	
Indigenous staff	9	10%	2	11%	1	5%	0	0
Non-indigenous staff	78	90%	16	89%	20	95%	20	100%

From the above table, we have observed that the staff composition is mostly staff that are not indigenous. The dominant race group in all universities was white. Students of the #FeesMustFall movement have also mentioned that whiteness, colonial thinking, will not end while the faculty is still mostly white.

A further observation is that none of the indigenous staff members held positions of influence, such as head of department which requires staff members to have a PhD and research activity.
Table 3 summarises the indigenous staff qualifications:

Table 3: Indigenous staff

	U1		**U2**	**U3**		**U4**
Rank	**SL***	**L***	**SL**	**L**	**AL***	**N/A***
Total indigenous staff per rank	6	3	2	0	1	0
CA(SA)	6	1	2	0	0	0
Masters	5	2	0	0	0	0
CA(SA) &Masters	5	0	0	0	0	0

*SL = senior lecture, *L = lecturer *AL= Assistant lecturer *N/A = not applicable

Academic qualifications and research activity

We mentioned that, as a minimum, academics are required to have a Masters degree for them to perform independent research. An academic is considered research active if they have published academic research papers in accredited journals in the past 5 years (Samkin & Schneider, 2014).

Table 4: Research activity

	U1	**U2**	**U3**	**U4**
Total (school academic staff)	87	18	21	20

Research active	22	25%	1	6%	7	33%	7	35%
Masters	69	79%	10	56%	10	48%	10	50%
PhD	17	20%	7	39%	7	33%	6	30%

The number of research-active academics is still low when compared to peers in Australia and New Zealand as noted by Samkin and Schneider (2014). This is linked to the fact that there are some universities where there is a large number of staff members that do not hold a Masters degree. There are even less staff members with a PhD, meaning that the staff that are not research active are receiving less guidance and mentorship. The lack of research activity also slows down the process to develop curricula.

In addition to being research active, Vorster and Quinn (2012) believe a postgraduate degree in higher education would equip the lectures with adequate skills for curriculum development. We also observe that very few staff member had formal higher education training, with 6 -14% of staff having a post graduate degree in higher education.

Table 5: Academic staff with Post graduate degree in higher education

	U1		**U2**		**U3**		**U4**	
Total (school academic staff)	87		18		21		20	
Post graduate degree in higher education	5	6%	1	6%	3	14%	2	10%

WAY FORWARD

We started off this paper to find out, from literature, what skills are required to decolonise a curriculum and thereafter assessed whether South African accounting academics' possess these skills. It was evident that for South African accounting academics to heed the call to decolonise the accounting curriculum there needed to be a fundamental change to the status quo.

To decolonise the curriculum we argued that knowledge of indigenous knowledge should be central to the process. Australian universities have made sure that indigenous people are represented in the academe to drive knowledge creation of indigenous knowledge. The slow pace in transforming the South African academy, to be more representative of the country's demographics, has delayed the response to the call of decolonisation and will continue to. Transformation should go beyond having indigenous people in the schools of accounting but also have indigenous people in decision-making positions to drive the cause.

We echo a few scholars' sentiments that the nature of the relationship between the SAICA and accounting academics is detrimental to the development of the accounting academy. A relationship between accounting professional bodies and accounting academics is not unique to South Africa peers in the United Kingdom, Australia and New Zealand have relationships with accounting professional bodies. The difference is that these academics know that their duties go beyond training students for professional examinations but also includes creating knowledge. If South African accounting academics continue not doing research the process to decolonise the accounting curriculum will likely not start.

Given that a majority of accounting academics in schools of accounting do not have an education qualification, it would be ideal for departments to have teaching and learning committees with individuals that specialise in curriculum design to help in the process.

This paper is the first step towards the journey to decolonise accounting curriculum. Once academics have the skills above we believe that they may then embark on robust discussions on how to decolonise the accounting curriculum to represent a multi-sided view.

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TRAINING POSTGRADUATE STUDENTS TO CONDUCT HIGH QUALITY RESEARCH USING MATHEMATICAL MODELLING: EXPERIENCES FROM THE AFRICAN POSTGRADUATE ACADEMY

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Abstract

In order to remedy postgraduate student's deficiencies in mathematics and to provide training for students to perform high quality research, academics at the Tshwane University of Technology (TUT) in partnership with other institutions launched the African Post Graduate Academy (APGA). The Academy is closely affiliated with the African Journal for Science and Technology, Innovation and Development (AJSTID) and seeks to provide cutting edge, relevant training to postgraduate students and equip them with the required research skills to enable them complete their postgraduate degrees in record time. One of the core focus areas was on mathematical modelling for students in Science Technology Engineering and Mathematics (STEM) related fields. From discussions with concerned students they struggled with understanding what mathematical modelling is all about, failed to distinguish between different mathematical techniques and their applications. Moreover a lot of STEM postgraduate students were clueless about steps to take to gather data, data processing techniques, model validation, sensitivity analysis, scenario analysis etc. This prompted the postgraduate academy organizers to include a session on mathematical modelling at the 4th and 5th editions of the African Post Graduate Academy which were held at TUT and the University of Johannesburg (UJ) respectively. The students were given detailed training on mathematical modelling techniques and skills with lots of practical examples and case studies. This paper discusses the experiences from the sessions on mathematical modelling, lessons learnt and recommendations for improved postgraduate academic performance.

Keywords: African Post Graduate Academy, Mathematical Modelling, Postgraduate Education, Science Technology Engineering and Mathematics, Mathematics Education.

Introduction and Background

The South African tertiary education set-up is made of twenty six universities. According to the Department of Higher Education and Training (DHET), annual report for the 2015/2016 financial year, this consists of 11 conventional or traditional universities which offer theoretical based programs, six universities of technology (or *technikons*) offering vocational focused programs and nine comprehensive universities which offer programs focused on both theoretical and vocational skills (DHET, 2016).

In terms of statistics, the total number of enrolled students (full-time, part-time, contact and distance learning) in the country's universities is 969 154 for the 2014 academic year (DHET, 2016). Compared to the numbers from the 2011 year (938 201) this represents a 3.3% increase.

However, this numbers do not measure up to the 2014 enrolment target setup for Universities and it represents a decline from the all time high in 2013 of 983 698 students. The goal of the

sector is to increase the total student enrolment to 1.6 million in the year 2030. The university system however met its targets in terms of annual number of university graduates. Although a target of 174 038 graduates was envisaged for the 2014 year, actual number of graduates amounted to 185 373 (DHET, 2016). Again, comparing this with figures obtained from 2011 (160 625), this culminates in an increase of 15.4 %. This shows that the increase in graduation rates (15.4%) trumps that of student enrolments (3.3%) (DHET, 2016).

When considering statistics, two that stand out in today's knowledge based economy are the number of research based postgraduate students graduated and graduates in STEM based disciplines. Looking at the numbers, it shows that the number of research based Master's graduates increased from 5281 graduates in 2011 to 7229 in 2014 (culminating in a 36.9 % increase) whilst the number of PhD graduates increased from 1576 to 2258 (a 43.3% increase). In STEM based disciplines, the country graduated 7259 natural and physical science students, 12058 engineering students and 19124 teachers (DHET, 2016). This numbers again represent an increase of 659, 1958 and 1624 respectively when compared to the targeted output rates. On the whole these statistics show that the South African higher education system is exceeding self imposed targets and development plans.

However when comparing the statistics from South Africa concerning graduation rates from STEM disciplines and postgraduate studies, a sobering picture emerges. Brazil's University of Sao Paulo (Brazil is a country in the BRICS consortium which groups similar sized economies together) produced 2244 PhD's in 2010 compared to 1423 PhD's produced by South Africa (City Press, 2014). Looking at the number of PhD per million in the same year, Korea produced 187; Brazil produced 48 whilst South Africa's production amounted to 28 (City Press, 2014).

In the STEM disciplines, South Africa produces about 45 engineers per million. The figures for USA, China and India are 380, 225 and 45 respectively (McKechnie & Bridgens, 2008). Considering a different statistical measure (number of people per engineer), South Africa's value is 3200 whilst other regions like India, North America, China have values in the range of 130-450 (McKechnie & Bridgens, 2008). In China, about 500 000 engineers and technicians are produced annually which is about 30-46% of the nation's graduates.

A number of reasons have been adduced for the comparative low figures for postgraduate and STEM graduation rates. This has been attributed to the deficiencies in our educational system with many students unable to get scores to enable them study STEM degrees. Another factor is the history of the nation where a large swathe of the population was hitherto denied significant accesses to quality education. Poverty also plays a major role, as often students need to be incentivised to study for postgraduate degrees instead of seeking employment opportunities. Supervisory capacity is another challenge as there needs to be strategic initiatives to increase the capacity of the universities to supervise the postgraduates the country so desperately needs.

From the foregoing it is clear that South Africa needs to increase her production (graduation) of postgraduates' across all disciplines and particularly in the Sciences, Technology, Engineering and Mathematics (STEM). For South Africa to remain competitive internationally and grow her economy the higher education system needs to produce graduates with skill sets specifically tailored for the burgeoning knowledge economy. The country also has to increase the number of participants in the postgraduate higher education sector and their graduation rates. South Africa has set an ambitious target via the *National Development Plan* (NDP) (National Planning Commission, 2012) of increasing the number of

PhD graduates to 5 000 by the year 2030. It is envisaged that this is going to cost the nation $ 580 million annually to achieve this feat.

The need for producing more postgraduates in South Africa and the drive to increase graduation rates in STEM discipline necessitated the creation of the African Post Graduate Academy (APGA). APGA was conceptualised as an initiative of the DST/NRF SARChI Research Chair on Innovation and Development at TUT and it's meant to provide training to postgraduate students and supervisors on how to conduct high quality research and graduate in record time. This paper therefore attempts to review experiences of students that are actually enrolled in postgraduate programs that have need of mathematical modelling. It documents the challenges students' faces and provides solutions and recommendations to improve postgraduate teaching and learning. The rest of the paper is organised as follows: The next section introduces mathematical modelling. This is followed by a section dealing with the APGA experience with mathematical modelling in teaching and learning. The subsequent section is devoted to observations and recommendations as obtained from our APGA experience after which the paper is concluded.

Mathematical Modelling

Mathematical modelling is essentially concerned with the utilization of mathematical concepts and abstractions to describe a domain or a phenomenon of interest. Mathematical modelling finds applications in a wide variety of domains and this has made mathematics to arguably be the academic subject with the most diverse application areas (Niss, 2012). Deploying mathematical modelling in different disciplines essentially involves either an implicit or explicit mathematical representation (Niss, 2012) of a problem, property, features, characteristics or issues in the domain or discipline under investigation. The aim is to better comprehend the domain being analysed, sharpen acumen on the characteristics/problem/issues/features of the domain or phenomenon of interest and utilize this acumen or insight in effective management (preventive actions, predictions, causative analysis) on the domain or subject of interest (Niss, 2012). Simply put, the problem has to be converted into a number of mathematical representations where the mathematical representation to a large extent has to accurately depict the problem at hand. The mathematical representations have to be solved using the right mathematical approach, tool and technique. The results obtained from the mathematical tools then have to be interpreted and correlated to the initial representation of the problem at hand. The obtained results (from the mathematical model) are in essence results to initial problem in the domain of interest. This drawn out procedure: Converting a practical problem to a mathematical notations, deploying mathematical tools to solve the obtained mathematical problem and utilizing the obtained results to manage the practical problem is known as the mathematical modelling cycle (Niss, 2012) and is represented in Figure 1. (Bliss & Libertini, 2016).

It is therefore imperative that the modeller be able to accurately reason in the language of mathematics and also possess the ability to wittingly sift through lots of detail from the considered problem and make a clear and reasonable judgement on the importance and usefulness of the details/facts. This in essence means that the modeller has to decide which facts/details to consider and which ones to ignore. These decisions have to be made in light of several factors, like the need for model simplification, paucity of data, and degree of computational complexity amongst many other factors. The key tests of good mathematical modelling practices can be given as: reasonability, simplicity, verifiability, generalizability

and formality (Arseven, 2015). These are often referred to as the five pillars of mathematical modelling and any mathematical model and the attendant solutions have to rigorously satisfy these key tenets (Ferri, 2006).

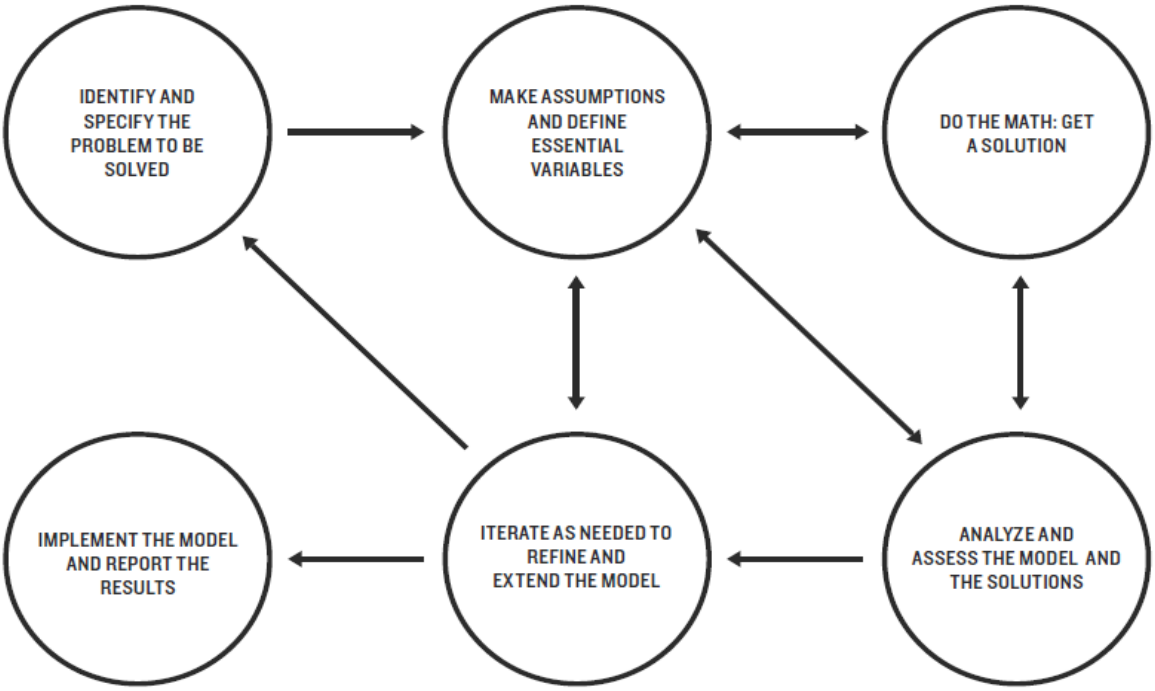

Figure 1. The mathematical modelling process (Bliss and Libertini, 2016).

Mathematical Modelling In Postgraduate Teaching And Learning: The APGA Experience

The very nature of mathematical modelling means that it finds practical applications in many disciplines. Thus at APGA sessions we have discovered postgraduate students in attendance from all faculties across a wide spectrum of Universities in South Africa. There have been students in engineering, information technology, natural sciences, social sciences and few students from the education faculties. The postgraduate students included Masters Students (both coursework and research based) and doctoral students. The earlier sessions of APGA (1st – 3rd editions) did not feature sessions on mathematical modelling. They were generally based on general training for postgraduate studies. Topics treated usually included: how to obtain a research question, understanding the different types of academic research, academic writing etc. However, it was discovered that the majority of the students complained that their research endeavours were stuck based on challenges they encountered due to mathematical modelling. We distinguish the challenges encountered by those that pertained to the students' ignorance of mathematical modelling and its applications and those that pertained to complaints about their supervisors or lecturers. Common complaints from students about mathematical modelling include:

- I do not understand the mathematical modelling process
- I understand the real world problem I am trying to solve, but I don't understand how to convert it to mathematical abstractions
- I do not know the appropriate mathematical modelling tool to deploy

- I don't know the right software/computer simulation tool to use
- I have no prior programming experience
- Using software required some knowledge of computer science domain specific parameters which I am unfamiliar with.

On the other hand, there were extensive complaints about academic personnel (supervisors in cases of research based programs and lecturers for coursework based programs) and the quality of expertise provided by the academic personnel (supervision and teaching). Common complaints included:

- The academic personnel do not explain concepts clearly
- Academic personnel give simple examples that were unrelated or simpler than what I encountered in the course of my research
- Academic personnel isn't patient to understand my questions and provide clarity
- I don't see academic personnel as often as I would like and our contact sessions are often short.

Finally the academic personnel present (very few are present in our sessions) also had a number of complaints about their students:

- The students are not academically curious
- Students want to be spoon fed
- Students disappear for long periods of time without any significant research work accomplished.

In light of these complaints, the organizers decided to pay increased focus on mathematical modelling in subsequent APGA sessions. The actions formulated are given next:

Interventions

The organisers of APGA therefore decided to create a major session on mathematical modelling in the academy programme. This was open to all postgraduate students and not only those with STEM backgrounds. The title of the session was Mathematical Modelling & Simulations: Underlying Concepts and Applications. The outline of the session covered topics like:

- What is a mathematical model?
- What makes a good mathematical model?
- What are the modelling pitfalls to avoid?
- What model should I use?

- Steps in building a mathematical model?
- Types of mathematical models?
- What are probabilistic models?
- What is mathematical optimization?
- A practical example of mathematical optimization
- What software's are useful?
- Conclusions

As it will be difficult to go over all the concepts pertaining to the different types of mathematical modelling in a short time span, a panel session was also created where students also shared their research work and received feedback from a panel made of interdisciplinary experts with considerable expertise in mathematical modelling theories and applications. On the average each panel considered 5 student presentations and provided valuable feedback. Finally a mentorship scheme was instituted where interested students were paired with postdoctoral fellows in order to provide long term guidance or help with the mathematical modelling aspects and general aspects of their work.

Discussion of Findings and Recommendations

This section serves as recommendations based on our experience whilst conducting mathematical modelling sessions at APGA. This section will be subdivided into three subsections based on the complaints from students and academic personnel.

Postgraduate Supervision and Lecturing

A major challenge we discovered based on our interactions is that often times some of the supervisors especially in the research based degrees don't really have research experience in mathematical modelling. Often their areas of expertise lies in the discipline itself and they are not well versed in the translating practical/ real world discipline specific challenges into mathematical notations and interpreting results. Another common occurrence encountered was that supervisors had applied the mathematical modelling before but usually in a few instances (perhaps in their PhD thesis alone) and thus were not able to extrapolate principles into newer or different problems. This often led them to almost constrict newer research by students to extensions of their PhD work. A solution to this issue will be to provide training sessions on mathematical modelling to supervisors or urge supervisors to engage co-supervisors with the necessary expertise in mathematical modelling. Finally it is recommended that students have frequent contact sessions with their supervisors. It is not ideal for students due to lack of contact sessions or miscommunication via email messages to go on an erroneous research path for months on end and only to realize this when they meet their supervisors after a long time.

For taught masters programs, we believe it will be helpful for lecturers to go through the mathematical modelling process in detail with a practical problem as opposed to giving students complex term projects after having only given them exposure to very few and relatively simpler problems. It is understood that the aim of giving students simpler models and assessing them on more complex models is to enable students engage on exploratory

research, however this drive has to be tempered by the huge learning curve this often entails and the need to shorten this for effective learning.

Learning

In the final analysis students will not completely grasp concepts related to mathematical modelling in a one day APGA session (especially students in research based postgraduate programs). In our experience students in the taught masters program have a better chance of understanding the mathematical modelling process as they have been taught using formal contact sessions the fundamentals of mathematical modelling (even though they complain they cannot extrapolate their knowledge to more complex models). We discovered that research based postgraduate students have a much steeper learning curve. It is thus highly recommended that some form of training is given to students to give them a head start in modelling and simulation. This can perhaps be at the start of their programs in the form of students taking mathematical modelling centred course work or attending a longer training APGA session. Feedback from our sessions showed significant understanding about the mathematical modelling process by having difficult concepts explained to them via session lectures, panel discussion and mentoring program.

Governmental Interventions

To make recommendations on governmental interventions in the light of postgraduate education in mathematical modelling, it is necessary to understand the present interventions by government with regards to postgraduate education in the country and the drivers or factors that spur it. These interventions can be grouped into four and are shown in Figure 2 (Cloete et al., 2016).

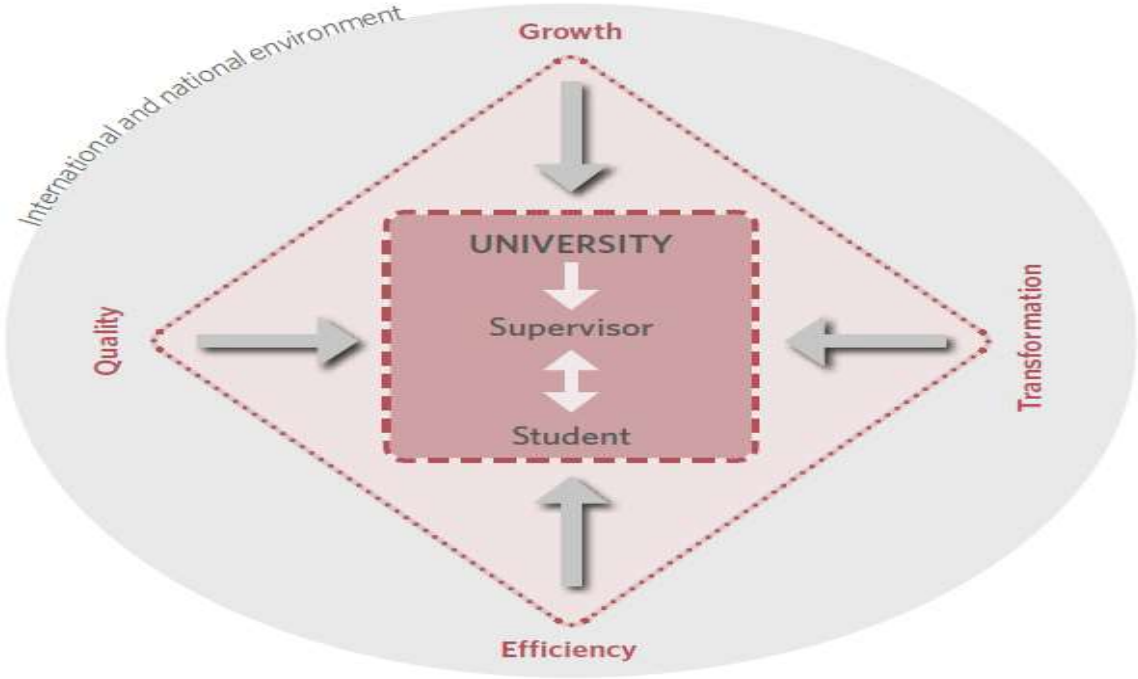

Figure 2. Factors affecting the supervisor-student nexus (Cloete et al., 2016).

These factors are external to the university (from the government and other external stakeholders basically) and are grouped under the following four headings: growth, quality, efficiency and transformation (Cloete et al., 2016).

Growth refers to the overreaching desire for South Africa to increase the number of successful PhD graduates because of the need to wean the economy from an extractive based one to knowledge based one. This stems from the need for South Africa to be competitive internationally. Efficiency refers to the pressure by government to ensure that a high graduation rate for postgraduate degrees is achieved in relation to its postgraduate investment. The third factor is transformation which seeks to redress the historical educational imbalance in the nation. There is a drive to increase the number of black researchers and the number of female academics. The fourth indicator is quality. Many academics consider quality to be sacrificed in the drive to achieve ambitious graduation targets for postgraduate programs. All these factors are challenges that the South African higher education system has to grapple with and it is in light of this setup that recommendations are made.

The first recommendation has to deal with quality of mathematical modelling postgraduate research produced. Most faculties and programs have ethics committees that review the work of students and provide clearance for students that serve to indicate that the ethics aspect of the work has achieved some form of quality control. It is suggested that this important aspect also include some form of quality control of the mathematical modelling approach considered and this has to be judged in light of the five pillars of mathematical modelling: reasonability, simplicity, verifiability, generalizability and formality. In a number of Universities, this is being done, but it is advised that this is standardized and some sort of standard is designed for this. Very often, wrong mathematical tools are used for research problems and it calls into question the quality of the research work being done.

Other recommendations hitherto given in the literature and supported by the authors include increasing the supervisory capabilities of academicians who have considerable expertise in mathematical modelling research and further incentivising students to undertake postgraduate study.

Conclusion

In this work, we provided our experience in running training sessions on mathematical modelling via APGA. These sessions were setup to combat the challenges encountered by students undergoing postgraduate study in South African universities. We detailed the complaints and the steps taken to address/remedy them. Finally recommendations from our experience were given and one of the key recommendations was the creation of mathematical standards for mathematical modelling applications in postgraduate disciplines and increased training for supervisors and students.

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STRATEGIES FOR SUCCESSFUL TECHNOLOGY INTEGRATION IN TEACHING AND LEARNING

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Abstract

Access to new technology has led to an increase in intrusion, theft, defacement, and other forms of loss that brought many incidents of threatening, harassing, embarrassing and humiliating conducts in South Africa. Schools that have installed computer centers or laboratories cannot attain their vision of successful technology integration for teaching and learning. In many occasions, school computer laboratories are broken into and all computer equipment stolen. If computer laboratories are well protected against theft, they are often degraded to a point of uselessness because of poor maintenance. This article explores the strategies public schools use to address challenges to successful technology integration in education in terms of security. A qualitative case study design was employed to collect and analyse data from five public schools. A purposeful sampling strategy assisted in the selection of ten participants who were engaged in the face-to-face interviews. In all the processes of data collection, ethical measures were adhered to. The findings indicate strategies that schools use: physical security; biometric devices, monitoring, community involvement, installation of antivirus program and discontinuing the use of memory sticks. The article concludes that schools should design and implement strategies to mitigate challenges related to computer security as a way to improve successful technology integration in education. This study used a small sample that cannot be generalized in the entire country. Consequently, the article suggests further research in the same field.

Keywords: strategies, technology integration, computer security, public school, technology gadgets

Introduction

The growing popularity of the technology gadgets and devices in public schools increasingly attracts criminals, disrupt the smooth management and administration, and threatens the lives of humans in and out of the school premises. There are many incidents of threatening, harassing, embarrassing and humiliating conducts (Popovac & Leoschut, 2012; Stanton, Stem, & Mastrangelo, et al., 2004). South African public schools are challenged with measures to secure and manage the computer-related technology infrastructure. Technology gadgets and equipment such as smartboards and tablets were stolen in schools (Mzekandaba, 2016). This poses a serious challenge to schools in integrating educational technology successfully for instruction. Furthermore, there is no guidance for schools to deal with computer security, and clear consistent procedures to be followed (Bailey, 2012). There is a

gap between the amount of technology available in schools today and the evidence in using such technologies for instructional purposes. Less than half of the 3000 surveyed teachers reported using technology more frequently for administrative tasks such as grading and attendance. Similar studies indicate that teachers more often use technology for non-instructional tasks such as communicating with peers and parents (Russell, Bebell, &O'Dwyer, et al., 2003) or preparing teaching materials (Cuban, Kirkpatrick, & Peck, 2001).

Despite the challenges and barriers, technology when successfully integrated in education, stimulates and actively engage students in knowledge construction, improve thinking, problem solving skills, self-concept and motivation (Trowbridge, Bebee & Powell, 2008; Sivin-Kachala & Bialo, 2000). It was from these challenges and barriers that this study explored the strategies public schools use to address challenges to successful technology integration in education. The study hope to develop an understanding of effective problem solving, and inform teachers about possible strategies that could be used successfully when integrating technology in education. This article reports on a qualitative, interpretivist study focusing on the use of educational technology for teaching and learning by public schools. It addresses the strategies used to reduce the challenges to successful technology integration in education.

Conceptual Framework

There is limited available research on strategies to successful technology integration in education especially on the security of education technology. Many studies have reported failure in successful technology integration for educational purposes (Keengwe, Onchwari & Wachira, 2008). Technology has been underutilized and not integrated in an effective or creative ways (Ramorola, 2014), and the majority of teachers do not integrate technology into the curriculum (Keengwe, et al., 2008). This study built on several studies that analysed the challenges and barriers to technology integration in teaching and learning. These challenges and barriers are thoroughly reviewed in literature and summarized briefly in the next section.

Hardware Theft and vandalism

These could take many forms; from student cutting a computer cable or files to individuals breaking into a school and randomly smashing computers (Shelly, Gunter, & Gunter, 2012). Computers and VCKs are hot items targeted because they are easy to resell (Kristen, 1996). Such items are most likely stolen from schools during the night meetings. This results from many burglars having pre-orders of what people want before they go looking. In the Californian schools, many losses are attributed to internal theft, i.e., people who work within the schools either steal, take or borrow items without returning them back.

In South Africa, there has been a steady increase in burglary-related crime, which has a direct effect on schools. A dangerous practice to computer security in schools could be that visitors to the computer centre were not escorted (Fourie, 2003). Theft, burglary in schools occurs internally, and it is caused by learners' misbehavior (Ramorola & Cronje, n.d.). To this, there are many reports of computer laboratories being set up in schools only to have computers stolen within a couple of days (Ford & Botha, 2010). This implies that the level of physical access security are inadequate and need attention. Essentially, access and control begins with access control to the building by the security guards and electronic access control, which both need improvement (Fourie, 2003).

Computer Viruses

These remain an imminent threat and widely encountered by users (Fourie, 2003). Viruses are one of the threats schools experience with their machines that might have been inadvertently brought to schools through the learners or teachers' memory sticks (Ramorola & Cronje, n.d.). Viruses are designed to affect the computer and servers (Fourie, 2003) negatively without the user's knowledge or permission by altering the way it works (Shelly et al., 2012). Though there is limited literature on viruses in schools, both South Korea and South Africa experienced some attacks in 2009. South Korea experienced a Distributed Denial of Service (DDoS) attack where thousands of infected personnel computers were turned into zombies spreading malicious codes with connection requests to websites, which in turn paralysed the websites creating the DDoS (van Vuuren, Phahlamohlaka & Brazzoli, 2010). Malicious code spread and overwrote the infected computer's hard drive that resulted in massive loss of data and information (ibid). Some reports suggests that the hack was done by the use of an insecure memory stick (Phahlamohlaka, van Vuuren & Coetzee, 2011).

Similarly, South Africa's first attacks results from an e-mail worm "Sixem-A" that disables anti-virus products, attempts to download more malware, that also forwards itself to e-mail addresses saved on the victim's computer (McMillan, 2009). The first of the scamming attacks already started with the e-mail advertisement where a South African airline offer 200 people a free opportunity and all expenses paid trip to watch the first two games of the FIFA 2010 soccer in South Africa (ibid). The only request to the bidder was to send their personnel information to a certain e-mail address (Dirro, 2009).

Unauthorised Access and Use

This considers all access of parties, which have no business directly related to the functional logic of the applications or a legally justified access right (Shelly et al., 2012). Unauthorised parties can either be external attackers or internal staff of the operator of the service or the

infrastructure (Garfinkel, Pfaff, & Chow, et al., 2003). Stover (2005) identifies several incidents of internal hacking in several regions: In Pennsylvania a group of students misused the school-issued laptops to download inappropriate material from the internet, monitor staff use of computers, and attempt to hack into their school. In Panama City, Florida, three high school scholars were found to have been hacking into a high school computer to improve their friends' grades. In Elk Grove, students used decryption software downloaded from the internet and keystroke-recording device that identified passwords as teachers typed them onto keyboards. Other incidents involved average kids who simply took advantage of a lack of vigilance. One student found a teacher's password taped to the back of a computer monitor; another sat down at the desk of a teacher who left the classroom without logging off the district network.

Software Theft

Software theft varies from a student physically stealing a compact disc to someone who intentionally pirates software (Shelly et al., 2012). Hinduja's (2004) study indicates that 51,3% of all respondents do not regard piracy as improper or intrinsically wrong. The form of software theft includes the act of transferring unauthorised "full version" software; serial number for registering shareware; "keygens" and "cracks".

Information Loss

Information loss radiates from power failure and sometimes from theft. Ramorola and Cronje (n.d.) found learners directly plagiarising fellow learners' work from the workstations and unintentionally deleting fellow learners' files stored on the hard drive. This behavior qualifies to be either information theft, which refers to as unauthorised disclosure of confidential data to non-trusted parties, unintentionally or deliberately (Yu & Chiueh, 2004). Information theft often is linked to other types of computer crime (Shelly et al., 2012). Ramorola and Cronje further discovered that information is lost due to system failure that result from poor maintenance.

These incidents leave us no options but to investigate strategies that will assist schools to manage and secure the school computer-related technology in order to integrate technology successfully in education. However, over the past two decades, many private service providers made use of international standards to manage security risks (Govender, Kritzinger, & Loock, 2016). Furthermore, residents protect their homes against burglars by erecting fences and installing burglar bars on windows (Rogers, 2008). These strategies could predominantly be applied in schools.

Security procedures

In literature, there are several approaches to secure computing infrastructure for software. An administrator (Garfinkel et al., 2003) uses a closed box execution environment to protect the virtual machines against unauthorised access. These approaches secure the integrity of the software and thus substantially restrict administrators' liberty to abuse infrastructure and data; they however do not fundamentally impede access to unencrypted user data while being processed. Jung (2012) designed a model "document checkpoint" which prevented the leakage of sensitive documents. The model allows permission to insiders when access to a requested document is related to their duty and role, and denies an access to documents when the insider requesting an access to documents has a different security level. The model further denies an access to documents with each different security level simultaneously and hides information of copyright and ownership in the document by a watermarking mechanism.

Research design

This study was conducted in Gauteng Province of South Africa. This qualitative study utilized a case study methodology and for this reason, it can be viewed as an 'instrumental case study' because I wanted to gain more insight into the strategies public schools use to address the challenges to successful technology integration in education. The case studies clearly revealed widespread diversity on a variety of issues, which could not have been explored thoroughly using other research approaches. It is important to understand how schools address the challenges to technology integration in their instruction. Thus, this article explored the strategies public schools used to address challenges to successful technology integration in education in terms of security-related issues. The corresponding research question is: what strategies do schools employ to secure and manage the computer infrastructure? With this in mind, this study hope then to set out some implications for successful technology integration in teaching and learning in the digital age.

Purposive sampling was used to select five schools to participate in the study. The selection criteria was based on schools having computers used for teaching and learning. From the schools, a group of ten teachers was then selected to participate through semi-structured interviews with open-ended questions. Thus, the participants were viewed as information-rich cases, which the researcher learned most from (Patton, 2002). Probing was used to obtain deeper and richer information (ibid). The interviews took approximately thirty to forty-five minutes and were audio-taped and then transcribed verbatim.

The solutions from the interview questions were analysed by noting the explanations and the strategies employed. The analysis took "place on two levels: the actual words used by the participants and the conceptualization of these words by the researcher" (Henning, Van Rensburg, & Smit, 2004: 132). Conclusions were drawn from the meaning derived from the

data. I assessed their implications and verified the data by revisiting it and cross-checking it for themes and patterns.

In terms of ethical considerations, approval for protocols was obtained from the University of South Africa, the Provincial Education Department, and the participating teachers consent for their participation. Some limitations of the study were that not all teachers were interviewed. Scheduling interviews with all participating teachers would not have been possible because of teachers commitments to some departmental workshops and meetings. So, it was decided to carry out only ten interviews, thus limiting the generalization about the strategies used by all computer teachers. The interview questions were carefully designed after a lengthy discussion between the researcher and the mentor for reliability and external validity purposes.

Findings

Ten teachers were interviewed regarding the strategies they use to address the challenges to successful technology integration in education. Interview results were organized by the themes that emerged within each of the following strategies: physical security, community involvement, biometric devices, monitoring, and installation of antivirus program and discontinuing of memory sticks. Table 1 contains the themes and examples of the interview data that reflect those themes. Participants stated that they use physical security in their schools to secure the computer infrastructure. Participants have employed the security guards to patrol the school premises, while eight of them also installed burglar and security doors as well as cameras to secure. Four of the participants have installed the alarm systems while one participant additionally secured the school premises with razor wires and protected the computers with the dome.

Since participants have put some security measures in place, they have minimized the challenges of security in their schools. A school principal explained:

"*Burglary, I think we had six years ago. We have the security guards and the alarm system from a certain company, and Gauteng Online has its own alarms, which are serviced by DTS. Normally when there is anything they phone us even at night*."

Table 1: Summary of interview themes by strategy

Theme	Strategy and frequency		Sample response
Physical security	Schools employed the services of security guards	1 0	We have here the guard; the government provided us with the guard. (P3)

	Schools installed alarm systems.	4	We never had any problems concerning the security because the alarm system is functioning. (CO4)
	Other schools surrounded their premises with razor wires.	1	The building itself is well protected. There are razor wires. (CO1).
	Participants protect the computers inside the domes.	1	Each computer in inside the dome, which is locked so that in case there is this burglary. (CO1).
	Schools installed burglar and security doors.	8	We also have alarm systems as well as the burglar doors. (CO2)
	Other schools have cameras.	8	I think we are covered when coming to the risks even the school itself, we have cameras. (CO2)
Community involvement	Participants involve Police services to secure the school premises.	4	Before we were given the patrollers we realize that we need to get somebody because our caretaker stays far from the school… but then we have houses were rented out to the police men… their presence also makes a difference. (P1).
	People staying in the school	4	We are having the people who are staying in the school… we are having a shack that helps us with security. (CO3).
	Established relationship with the community.	1	If you establish a good relation around the school, be rest assured that even if it is not during school time when we are present at school, people around the school will always keep an eye on the school. (P2).
Biometric devices	Schools design usernames, passwords and encryption codes.	4	All learners have password, they can use their own passwords. They are registered there. (P1)
Monitoring	Participants supervise learners.	5	Proper monitoring of learners by educators…yes, only if they are well monitored. As an educator, I do not leave them just working alone. (CO1)
Installation of anti-virus program and discontinuing of memory sticks.	Schools installed antivirus program and discontinued the USBs.	3	We have antivirus installed here, but learners are not allowed to use the sticks. I think the system is designed in a way such that learners cannot download anything from them. But totally it's prohibited, even teachers cannot come with their USBs. (CO4)

Nine participants believe that establishing and maintaining a good relationship with community members and other stakeholders will minimize the computer crime. Four

participants have houses in the schoolyard, which they rented out to the police whom they believe their presence in the schoolyard makes a different regarding security of the school property. Other four participants have erected some shacks, which accommodates ordinary people staying in the schoolyard. The presence of these people in the yard helps with security. The remaining participant relied on the availability of people in the school surrounding:

"*If the school is in the middle of a village like this one, sometimes you just have to establish a warm relationship with people around the school, so that they know if they have the sense of belonging and have ownership to the school. They will report any movement they see, to cleared or will question even if you are not there. So, I feel that it's a great deal*."

Regarding biometrics devices, four participants believe that providing learners with passwords and usernames will assist in securing critical information. One participant mentioned the use of encryption code in their school that assisted in preventing learners from viewing incorrect site. Five participants believe that learners should be accompanied and monitored when in the computer center. To them, monitoring will reduce hardware and information theft by learners. The school principal supported this notion:

"*We have a committee of ICT here in our school; those people are the ones to ensure that at least learners when they want to research, a teacher supervises them. GOL has internet and learners are allowed to download and even print, they need an elderly person so that they do not go to the wrong sites. We had a challenge of theft before, but it happened when maybe the teacher who was in charge to supervise not going, then learners will steal the mouse especially. But now they don't take because the teacher must come to collect the key, sign for the key and after the period the teacher must send the keys back*."

Schools have installed anti-virus programs and discontinued the use of memory sticks by users. Three participants believe that this activity will reduce the risk of viruses that affect the computers.

Discussion

This case study explored the strategies public schools use to address challenges to successful technology integration in education in terms of security-related issues. While the knowledge of the barriers and challenges to technology integration is well established, this study offers valuable insight into teachers' perceptions of strategies to mitigate these barriers and challenges as they disrupt successful technology integration into their instruction. The qualitative data offer a rich description of these strategies that schools put in place to secure their computer infrastructure.

The most apparent finding is that schools have already put some efforts to secure their computers and other equipment by using a variety of physical security measures. This measure was found to be the most frequently used by all schools. Participants reported that physical security such as guards patrol the school premises twenty-four hours and this reduce the risk of unauthorized access. These findings are consistent with prior studies where access controls proven to have prevented unauthorized access to and use of computers (Shelly et al., 2012; Coaffee & Rogers, 2008).

The use of biometric devices such as creating usernames and allowing learners to use passwords as access codes prevented loss of critical information. Nearly half of the participants reported that passwords assisted them to control learners in the centre, because learners have to share computers. Other teachers reported that the use of biometric devices did not only address information loss related issues, but also assisted schools to deny learners access to sensitive data. Researchers have theorized that designed models such as document checkpoint can prevent the leakage of sensitive documents (Gertfinkel et al., 2003; Jun 2012; Shelly et al., 2012; Yu & Chiueh, 2004). The results of this study suggest that those theoretical gains can be realized in practical situations.

It was somewhat surprising that participants' perception of installing antivirus programs and discontinuing of memory sticks was least considered as a strategy to mitigate the risks to computers. This is likely because some of the computers in schools were designed not to allow the use of memory sticks. Participants often perceive the memory sticks as carriers of viruses and the virus detection and removal as a completely effective way to keep a computer or network safe from the viruses (Shelly et al, 2012). This supports some reports that the hack was done by the use of an insecure (malware infected) memory stick (Phahlamohlaka et al, 2011).

Despite participants' consideration of antivirus programs and discontinuing memory sticks, participants under this study implemented some strategies to minimize the challenges to successful technology integration into teaching and learning. In addition, participants monitored learners' movement in the computer centre. One possible reason for this is that visitors to the computer centre were not escorted (Fourie, 2003) and that many losses are attributed to internal theft (Kristen, 1996).

Deeper analysis of strategies to address the challenges to technology integration into teaching and learning, however, suggests that community involvement in this study substantially provided support to schools. Participants similarly reported that schools build relationships with the communities in their surroundings, as the community is an eye to the school and will assist in reducing the crime rate. In considering the importance of community involvement to

schools, participants reported that they have erected some shacks wherein they accommodated ordinary people whom their presence contribute to the school safety.

Conclusion

There are a number of models that reported failure in successful technology integration for teaching and learning (see Keengwe et al., 2008; Ginserb & McCormick, 1998; Ramorola, 2014). This case study provides teachers, administrators and educational technologists alike a valuable example of the effect of successful technology integration into instructional activities in an applied setting. The findings suggest that coming up with strategies to mitigate the risks to computer technology may be the key to providing teachers with knowledge and skills needed to integrate technology more successfully into their instruction. Exploring the strategies that schools used to address challenges to successful technology integration in education in terms of security issues is a critical step to change the way teachers use technology to support teaching and learning. The article concludes that schools should design and implement strategies to mitigate challenges related to computer security as a way to improve successful technology integration into teaching and learning. The study is limited in the way that is used a small sample that cannot be generalized in the entire country. Consequently, the article suggests further research in the same field.

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CHANGING THE LIVES OF COMMUNITIES THROUGH NUMERACY SKILLS TRAINING: THE CASE STUDY OF KHA RI GUDE LITERACY CAMPAIGN IN KHUTŠWANE, LIMPOPO PROVINCE

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Abstract
Literacy is one of the challenges facing many countries worldwide, especially the developing countries such as South Africa. In South Africa, different literacy programmes have been established to address the challenge of illiteracy among adults. Kha Ri Gude (a Tshivenda name meaning "Let us learn") is one of those programmes. The goal of Kha Ri Gude was to empower adults with literacy and numeracy skills and to create jobs for the unemployed youth in South Africa. Most studies on the success of Kha Ri Gude have focused on the number of literate adult learners the campaign has produced. However, these studies ignore the role played by numeracy skills in changing the lives of adults. The scope of this paper is therefore anchored on critical examination of the numeracy skills acquired from the Kha Ri Gude programme in changing the lives of adult learners. The study is guided by the transformative learning theory (TLT). The qualitative study was conducted in the Limpopo Province using interviews as data collection tools. The thematic data analysis was used to analyse data. The study found that the numeracy skills offered by Kha Ri Gude changed the lives of adults in the various spheres of life such as health, economy, self-employment, technology, and social. The study recommended that as adults prefer to learn what they can use immediately in their lives, the content of numeracy offered should help address the problems they face in their everyday activities.

Keywords: Transformation, adult learners, numeracy skills, Kha Ri Gude Literacy Campaign, Literacy

Introduction

Illiteracy is a challenge in developing countries including South Africa. In 2000, the United Nations met in Dakar and made a commitment entitled: "UN: Education for all". All the countries that met in this convention committed themselves to halve illiteracy by 2015. The slow progress in the eradication of illiteracy in South Africa led to the then Minister of Education, Kader Asmal issuing a call to break the back of illiteracy among adults and youth in five years. The Department of Education launched the South African National Literacy Initiative (SANLI) in 2000. However, SANLI was unsuccessful owing to a variety of factors (Aitchison, 2010). According to Ghettoverit's Weblog (2008), SANLI failed owing to "the vacuum that exists in the adult education and training sector as a result of the demise of

previous networks and lack of communication, synergy and unity of purpose which has resulted in a fragmented sector".

In 2006, the then Minister of Education, Naledi Pandor established the Ministerial Committee on Literacy (MCL). This Committee was tasked with developing a strategic plan for the mass literacy campaign (Skillsportal, 2015). The findings of this Committee engineered the birth of the Kha Ri Gude National Mass Literacy Campaign. According to the Ministerial Committee on Literacy 2007 in Chinyamakhovu (2012), in the main, the campaign was initiated as a result of the observation that South Africa's system of Adult Basic Education and Training (ABET) is not reducing the number of illiterates. This was in spite of the constitutional right of all South Africans to basic education in their own language.

As said previously, Kha Ri Gude is a Tshivenda phrase which means "Let us learn". The main aim of the campaign was to reduce the illiteracy rate among the 4.7 million South African who could not read and write. This group included all the adults and youth above 15 years of age, who could not read and write. The campaign was meant to enable this group of people to become literate and numerate in one of the 11 official languages by 2012. South Africa needed to reduce the illiteracy rate to reach the United Nations' (UN) Education for All Commitment (made in Dakar in 2000) by reducing the illiteracy rate by 2015. The programme was also aimed achieve the Millennium Development Goals (MDGs) on poverty alleviation, empowerment of women, HIV and AIDS eradication, environmental protection and sustainable democratisation and peace building (Vukuzenzele, 2012; Skillsportal, 2015).

Several studies (Dichaba & Dhlamini, 2013; Romm & Dichaba, 2015; McKay, 2015), have been conducted on the role of Kha Ri Gude in the provision of reading, writing and numeracy skills. However, very little has been written about how the campaign changes lives of ordinary adults through the provision of numeracy skills. Therefore, the research on which this article is based was conducted to examine how the campaign had been changing the lives of communities through numeracy skills. The research question reads as follows:

- How do numeracy skills offered by the Kha Ri Gude Literacy Campaign change the lives of communities in Khutšwane area of the Limpopo Province?

The objective of the study was to examine how numeracy skills offered by the Kha Ri Gude Literacy Campaign change the lives of communities in Khutšwane area of the Limpopo Province. The study sought to suggest measures to improve the numeracy skills to be offered to adult learners.

Having highlighted the background, the following section discusses the theoretical framework the concept of numeracy and its importance.

Theoretical framework

This study explores how lives of communities can be changed by using numeracy skills through the Kha Ri Gude Mass Literacy Programme. This study is underpinned by the

Transformative Learning Theory (TLT). The latter was originally developed by Jack Mezirow, a leading academic in the field of adult education at the University of Columbia (Mezirow, 1997). Mezirow introduced this theory after researching the factors related to the success or lack of, women's re-entry to community college programme in the 1970's. The resulting conclusion of the research was that a key factor was transformation of perspectives of the participants (women). (Mezirow, 1978). Mezirow (2000:8) defines transformative learning as "…the process by which we transform our taken-far-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or more justified to guide action".

According to Tsao, Takahashi, Olusesi and Jain (2006), transformations often follow some variation of 10 phases of meaning:

- A disorientation dilemma'
- Self-examination with feelings of guilt or shame,
- A critical assessment of epistemic, socio-cultural, or psychic assumptions,
- Recognition that one's discontent and process of transformation is shared and that others have negotiated similar change,
- Exploration of options for new roles, relationships, and actions,
- Planning a course of action,
- Acquisition of knowledge and skills for implementing one's plan,
- Provision trying of new roles,
- Building of competence and self-confidence in new roles and relationships,
- Reintegration of new life into their life on the basis of conditions dictated by their own beliefs, assumptions and experiences into a new meaningful perspective.

These interconnections of the 10 phases of transformation are summarily explained as follows: After being faced with a disorientating dilemma (Phase 1), the learners' steps through the remaining nine phases (Phases 2-10) reflecting on their own experiences. Upon completion of the 10 phases, the learners will have transformed their own beliefs, assumptions and experiences into a new meaningful perspective (Tsao et al., 2006). According to Mezirow (1997), transformative theory postulates that adult education must be dedicated to effecting social change, to modifying oppressive practices, norms, institutions and socio-economic structures to allow everyone to participate more fully and freely in reflective discourse and to acquiring a critical disposition and reflective judgement. Therefore, learning should lead to the emancipation of the learner from their current unfavourable condition. Cranton (1992), adds that change can mean change in assumptions, perspective and behaviour. When applied to adult learning, TLT can therefore be seen as the essence of adult education aimed at helping the individual change or become a more autonomous thinker by learning to negotiate his/her own values, meanings, and purpose rather than uncritically acting on those of others (Mezirow, 1997). In the context of this

study, TLT is critical as by acquiring the numeracy skills provided by the campaign, the lives of adult learners will change.

The concept of numeracy and its importance

Numeracy-the concept

The definition of numeracy, which is sometimes called mathematical literacy is defined differently by different literature sources (National Numeracy (n.d.). There is therefore no universally accepted definition of numeracy according to literature. According to O'Donoghue (2002, p.47), the word numeracy was first expressed by the Crowther Report of 1959 in the United Kingdom, which also referred to numeracy "as the mirror image of literacy". The Crowther Report describes numeracy as the ability to reason and solve problems quantitatively. It also includes some understanding of scientific method and the ability to communicate at a substantial level about quantitative issues in everyday life (see also Learning Wales (n.d.). When applied in practice, numeracy may signify a number of things including basic computational arithmetic, essential mathematics, social mathematics, survival skills for everyday life, quantitative literacy, and an aspect of mathematical power (O'Donoghue, 2002). As people's life style changes, the meaning of numeracy also change. With the introduction of calculators, Her Majesty Inspectors of Schools in England proposed that numeracy should be defined as "the ability to use a four-functional calculator sensibly" (Ruthven, 2014, p.87). Numeracy could also mean the ability to reason with numbers and mathematical concepts, to apply them in a range of contexts such as work, home, health, and financial management and to solve a variety of problems in everyday life (National Numeracy, (n.d.)**.**The above definitions of numeracy indicate that numeracy is not confined to the classroom, but go beyond to solving problems experienced in everyday life situations. With the advent of the internet today, people are expected to make sense of the ever-growing mass of statistical information available on the internet and in the media. Therefore, numeracy skills play an important role.

The importance of numeracy

Globally, there has been an ongoing push to develop numeracy skills in various communities, by equipping children, youth and adults with numeracy skills. This move is indicative of the importance of numeracy skills in everyday life activities. More importantly, numeracy skills are important to an individuals' ability to get and keep jobs and manage their quality life. People with numeracy skills are twice as likely to be unemployed as numerate people (The Conference Board of Canada, 2014). Shepherd (2011) further contends that innumerate people, besides being trapped in unemployment, they are also trapped in low-paid jobs. With numeracy skills, people can for instance, understand personal finances or directions on a package of medicine (see also The Conference Board of Canada, 2014).

Besides having low chances of landing jobs, people with inadequate numeracy skills, innumerate people have minimal chances of qualifying for promotions. This resultantly hurts the economy through missed opportunities for innovation and productivity. In the workplace, inadequate numeracy skills present a risk for health and safety incidents, as there are safety and health documents, which include instructions and information in the form of charts, numbers and conditional statements. People with inadequate numeracy skills may not be able to understand written manuals and written symbols. In technology also, the ever-growing mass of information of numerical skills needed also affects them. Adult learners are not exceptions in this context as they are affected by the complexity of issues brought about by change (The Conference Board of Canada, 2014).

Methods

The study adopted the qualitative approach. According to Brynard and Hanekom (2006: 37), qualitative methodology refers to the research of the descriptive data. Generally, the participants' own written or spoken words regarding their experience or perception are produced. This study used the case study design. A case study involves an in-depth analysis or exploration of a case(s) (McMillan & Schumacher, 2014). This study is confined to Khutšwane a rural area in the Mopani District of the Limpopo Province, South Africa. The case study design was chosen because it was considered suitable and effective in determining intensive experiences of adult learners regarding numeracy skills as narrated by the learners themselves.

The population, of the study (Brynard & Hanekom, 2006), consisted of adult learners who attended the Kha Ri Gude Literacy Campaign classes. The sample, which was the group of subjects from whom data were collected were usually a representative of a population (McMillan & Schumacher, 2014) consisting of adult learners. The sample consisted of 10 adult learners who were purposively selected. Participants were included because they are learners at the selected centre, readily available and most likely to supply information-rich data. Data were collected by means of focus group interviews. Interviews were audio-recorded with the consent of the participants and transcribed. In order to enhance the validity and reliability of research findings, member checking (McMillan & Schumacher, 2014) was used. In addition, responses from participants were transcribed verbatim in participants' mother tongue, and later translated into English.

The thematic analysis was used to analyse data. According to Feraday and Muir-Cochrane, 2006 cited by Feza (2015, p.464), thematic analysis is "a quest to ascertain themes that surface as being significant in the narrative of the occurrences". The purpose is to uncover themes that are prominent in the data. McMillan and Schumacher, (2014) add that the process included in the thematic analysis is a code-category-theme. Transcripts from interviews were repeatedly read and codes based on the research objectives and questions were constructed. Regularities in participants' responses were noted. Codes (units) which belonged together were grouped until consistent and distinct categories emerged. Categories were reviewed

several times to ensure that those belonged together are grouped into themes. The themes that emerged were grouped according to the study purpose, objectives or questions and resultantly served as research findings (McMillan & Schumacher, 2014).

Findings and discussion of findings

When participants were asked about how the numeracy skills offered by the Kha Ri Gude Literacy Programme affect them, responses that came revolved around investment and banking, technological adaptation, participation in community activities with confidence, cheating and robbing and understanding health issues.

Investment and banking

The majority of participants indicated that before they could attend the programme, they understood very little about matters of banking and investment. The following are interview excerpts regarding this finding:

> *We borrow money as a group, e.g. five members. We call ourselves a "centre" as a group. We pay back the money in instalments.*
>
> *We group ourselves together as women and invest money for twelve months. We then withdraw the money at the end of the year and buy ourselves groceries.*
>
> *We are a group of men and women who meet on monthly basis. We then contribute money, about R2000.00 and give our host for that month.*
>
> *Kha Ri Gude helps us a lot. When we go to the banks, they expect us to complete banking forms. I can now complete banking forms and no longer rely on another person.*
>
> *Now I am able to count money, to open a bank account book and sign*

In African communities especially blacks, there is a practice of collective saving commonly known as "stokvel". This is the type of saving or investment where people pool their savings (financial) as groups to address certain community needs. The payments are arranged in such a way that they rotate among members every month (Makhura, 2015) or a member receives a large return after a specified time period of their investment (Sebola, 2016). "Mogodišano"- Northern Sotho word literally meaning mutual rotational payment of members, is another type of "stokvel" that the participants referred to in the interview extract above. In other words, members of a "stokvel" take turns in paying each other an agreed amount paid as a lump sum to each individual member. In the different types of "stokvel", innumerate adult people are exposed to being robbed and cheated as some lack the skills of banking because

they have poor numeracy skills. The problem of being robbed and cheated is elaborated below.

This finding of investment and banking is also in consistent with studies conducted in Grahamstown District in South Africa on the impact of the Kha Ri Gude programme on the lives of illiterates' pensioners in 2008. The pensioners initially struggled with using an automated teller machine (ATM) or opening a bank account. If they acquire literacy skills, they will no longer depend on family members to help them with their finances. It was further discovered that with some pensioners being literate, banks spent fewer hours with pensioners to help them to collect their social grants (Ghettoverit's, 2008). In their study on the assessment of Kha Ri Gude, Romm and Dichaba (2015) revealed that the programme graduates were able to go to the bank and use ATM machines without relying on literate people for assistance.

Technological adaptation

The participants also indicated that they could adapt well to the new technologies especially of cell phones. The following are some of the responses related to the ability to use cell phones:

> *In Kha Ri Gude classes they teach us how to read and write. Initially numbers were reading me (meaning she did not understand numbers). Now … I can also use my cell phone and understand numbers.*
>
> *We can access our cell phones and make calls.*

Another participant went further to say that beside the ability to make calls; they are no longer cheated by others when they put airtime for them. The following is the participant response:

> *In addition, we are no longer cheated by others when they load airtime for us in our cell phones.*

Beside direct contribution to worker productivity, literacy promotes more rapid technological adaptation and innovation (Abideen, Adewale & Adeola, 2013). This assertion was supported by Romm and Dichaba (2015), when they state that in their study, the adult learners who had attended Kha Ri Gude classes were numerate enough to send Short Message Services (SMS's) and also type numbers on their cell phones when they want to communicate with them.

In support of this finding, Mezirow (1997), asserts that as the world becomes more technologically sophisticated, work becomes more abstract, depending on understanding and manipulating information rather than merely acquiring it. As new forms of skill and knowledge are acquired, it becomes a challenge for adult learners to become effective

members of the future workforce. The resources should therefore be directed towards creating a workforce that can adapt to changing conditions of employment, exercising critical judgement as it manages technology systems, and flexibly engage in more effective collaborative decision-making.

As adult learners are usually tenacious in holding to their assumptions and often resist to questioning their assumptions (e.g. of anti-technology and technophobia), one would argue that TLT through critical reflection changes the learners' perspectives while transforming the learners themselves.

Participation in community issues with confidence

The participants stated that their ability to use numbers also helps them to participate confidently in community activities as one respondent confidently said:

In the community gatherings, we participate because we can read, calculate and write. I can now collect church money and record it down as a leader as how much have they contributed. They also want us to help at a church if a person contributes money to record the correct amount, e.g. R20.00, R10.00x2 notes makes R20.00.

It is revealed in literature that illiterate people suffer low self-esteem and lack of confidence. It is also reported that (Martinez & Fernandez, 2010; Linda cited in Abideen et al., 2013), people with basic literacy of reading, writing and arithmetic are better equipped to make more informed decisions for their communities and to be active participants in the identified indicators of social development such as economic, social and political development. A similar finding is described by Romm and Dichaba (2015) who in their study revealed that adults' knowledge of numbers increased their chances of involvement in community activities as they were able to serve on the School Governing Bodies (SGBs) and leadership positions in their churches.

Cheating and robbing

The participants indicated that their ability to work with numbers helps them to deal with those people who used to take advantage of their innumeracy to cheat them of their monies, especially their children. One participant explained:

> *When sending children to the shops, remember that these children rob us. Now I am able to count how much I have given him/her and how much should be the change.*

This finding is inconsistent with a study conducted in Uganda by Olinga and Lubyabyi (2002) a project on Integrating Gender into the National Agricultural Advisory Services (NAADS) The latter discovered that women lost out since many of them could not even count money. The illiterate women depended on the goodwill of buyers not to cheat them. Romm and Dichaba (2015) also discovered in their research in the Eastern Cape that graduates of the campaign felt that they were no longer cheated by others when they asked them to get airtime on their phones for them. The study conducted in some rural areas of

Nigeria by Abideen et al., (2013) reflected the relevance of literacy acquisition to the performance of farmers. The study shows that a farmer that knows how and understands when to use and apply fertilizers will be more productive than those who do not. This was so because the use of fertilisers also requires the ability to deal with numbers.

Understanding health issues

It was also indicated by the participants that before they could attend the Kha Ri Gude classes, they had found it difficult to understand issues affecting their health. The following is a response regarding this finding:

> *I can read medicine prescription and know how much and what time to take my medicine. I also remind others of their appointment dates for collection of medicine at clinics.*

A study conducted in Canada on adults with inadequate numeracy skills revealed that "inadequate numeracy skills present a risk for health and safety incidents in the workplace: health and safety documents often include instructions and information in the form of charts, numbers, and conditional statements" (The Conference Board of Canada, 2014, (n.p.). In addition, Romm and Dichaba (2015) in the study of the assessment of Kha Ri Gude in the Eastern Cape Province of South Africa, discovered that adult graduates of the campaign, were able to interpret information about various illnesses such as Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) and Tuberculosis (TB).

Conclusions

This study aimed at examining how numeracy skills offered by Kha Ri Gude change the lives of adults in the Khutšwane area of Limpopo Province, South Africa. The research findings presented have shown that numeracy is associated with a number of variables. The participants have shown that numeracy skills that they have acquired from Kha Ri Gude help them in investment and banking. More importantly, being numerate enables them to participate in community activities with confidence, they are enabled to adapt to technological advancement, they are no longer cheated of their monies, and they understand issues related to their health.

Based on the above findings and discussions, the researcher concludes that numeracy really change the lives of adults in different ways depending on the daily engagements of particular communities. It was indicated previously that the community in which the research was conducted deals with rural life. The majority depend on farming and vending for livelihood. It was therefore not found strange that they also engage in "Mogodišano". Therefore, they ensure that the little they make is invested or banked.

Recommendations

It is on the basis of the findings and subsequent discussions that the researcher recommends the following:

Firstly, although a prescribed curriculum is used in the education of adults in the Kha Ri Gude Literacy campaign, other numeracy skills relevant to their daily life activities should be considered. The researcher supports the approach taken by the Functional Literacy campaign in Malawi in the 1990s where literacy and numeracy were linked with development education. The reason being that the curriculum, which demonstrated relevance to peoples' struggle to improve their standards, is more attractive than the one that does not do so Kishindo (1994). The programme further ensured that education for adults in arithmetic consisted of simple calculations, which emphasised practical application.

Secondly, practical and job-related numeracy skills are more successful in adult learning than classroom-based (Vernon, 2010). This assertion is anchored on Mezirow's TLT, which states that often adult learners' immediate focus is on practical, short-term objectives, for instance, getting a job or promotion (Mezirow, 1997). In communities such as Khutšwane that are engaged in farming and vending, measurement skills, budgeting skills, financial report writing skills, should be added as "hidden curriculum" (unintended lessons not included in the curriculum but useful for everyday life.

Thirdly, on the basis of the first finding, where it is indicated that black communities engage in practices of "stokvels" for investment, the researcher recommends that in such communities, people should be taught banking skills, types of investments, cell phone banking, which obviously require numeracy skills. The campaign should include such skills, as the community needs to address their immediate challenges.

Lastly, as it is a mandate of the countries according to Dakar commitment: "UN Education for all" to eradicate illiteracy, the government should allow the campaign to continue as its contribution is widely acknowledged, failing which an alternative should be sought.

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UNPACKING THE ROLE OF LEADERSHIP AND MANAGEMNT STYLES IN TEACHING AND RESEARCH OUTPUT IN SOUTH AFRICAN HIGHER EDUCATION

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Abstract
Leading and managing institutions of higher learning the world over, has not only become a mammoth task, but also a very competitive and challenging exercise. The practice of ranking universities has given rise to huge investments in their core functions and activities. Teaching and learning has in most cases been regarded as the core strategic objective of higher educational institutions ahead of research and innovation; community engagement and leadership and administration. The role of leadership and management towards the success of other strategic objectives particularly teaching and research; has not been researched and documented exhaustively. This article discusses the impact of leadership and management styles on academic performance using the faculty of engineering and the built environment (FEBE) within the University of Johannesburg as the case study. The work used a qualitative research approach to collect data from university documents, online platforms and semi-structured interviews. Content analysis was used to derive meaning from the data. Research findings revealed a neat blending of traditional leadership and management styles with innovative and transformative approaches to achieve outstanding outcomes in both teaching and research and innovation within the faculty. The article concludes by acknowledging the critical role of leadership and management in institutions of higher learning and ends by recommending the adoption of blended leadership styles that are more skewed towards transformative leadership styles.

Keywords: Transformative leadership, research and innovation, teaching and learning, higher education, South African; University of Johannesburg.

Introduction
Historically, the function of leading and managing higher educational institutions has commonly been regarded as the least strategic objective at most universities. Teaching and learning has commonly been considered the first strategic objective in most institutions (Mashau, Mulaudzi, Kone & Mutshaeni, 2014). Research and innovation has in most institutions been regarded as the second key function after teaching and learning. Community engagement has historically been considered the third strategic objective where university staff members engage in solving community problems (Schulze, 2008) of universities. Interestingly, the world of governing universities is constantly changing making the managing and leading of higher institutions very demanding. Besides, the globalisation of

universities and resource constraints have given rise to complex environments that demand astute and responsive leadership (Fukuhara, 2016).Universities therefore need to be sustainable and viable against dwindling state financial support due to competing national needs. The mounting challenges facing higher education the World over resonate very well with the South African universities, hence the need for competent leadership astute and competitive leadership (Hofmeyer, Sheingold, Klopper & Warland, 2015). This article discusses the role of leadership and management of universities using the Faculty of Engineering and the Built Environment (FEBE) within the University of Johannesburg as the case study.

The paper sought to answer the following two research questions;

1. What are the common leadership and management styles that are being applied by Heads of Schools (HOSs), the Vice Deans (VDs) and the Executive Dean (ED) of the Faculty Engineering and the Built Environment (FEBE) within the University of Johannesburg?
2. What has been the impact of the leadership and management styles being implemented specifically on teaching and research strategic objectives of the University of Johannesburg?
3. What could be the role of innovative transformational leadership and management approaches in higher educational institutions?

The article starts by presenting the conceptual framework on leadership and management. It goes on to highlight the research methodology that was adopted and applied. The work then presents and discusses the study findings. It then concludes by proffering some recommendations that could promote and ensure more impactful leadership and management of the universities.

Conceptual Synopsis on Leadership and Management

Management and leadership are systems of action that have for a long time been presented as two distinct aspects with different characteristics, traits and activities (Mabelebele, 2013; Teleşpan & Halmaghi, 2012). According to Okçu (2014), management is the planning, organising, controlling and co-ordinating of organisational activities for the sole purpose of achieving set objectives and targets. Leadership on the other hand is concerned more with the transformation of organisations towards a desired future. Whilst leadership is mainly attributed to the influences on change in institutions (Bryman, 2009; Scott, Coates & Anderson, 2010), management is associated with the maintenance of efficiency in organisations (Bush, 2011). The two invaluable concepts of management and leadership are not mutually exclusive but complementary. They are both essential to ensure appropriate and correct administrative duties and meeting of immediate goals of organisations as well as giving the appropriate direction, clear vision, influence positive relationships and productivity in institutions (Bolden, Petrov, Gosling & Bryman, 2009; Boyatzis, Passarelli, Koenig, Lowe, Mathew, Stoller, & Philips, 2012). In the majority of cases, combining the two skills is a

great challenge, hence depending on the situation at hand, there is always need to find ways of applying the correct doses of the two and balancing them to achieve the best desired outcomes (Bush, 2007).

There are several types or styles of management and leadership (Deveau and McGill 2014). They are the autocratic style that is also known as authoritative style; the participative style that is also referred to as the democratic style; the laissez-faire style that is also known as open or free will management and lastly the transactional style (Chang & Lee, 2013). According to Eagly & Johnson (1990); pacesetting, facilitatory, situational and coercive are some of the terms that are used to describe these leadership and management styles. Management and leadership styles need to be applied at the same time in an organisation to achieve the desired outcomes. It is the nature of organisations, their cultures and goals that determine the styles of management and leadership to be adopted and applied. Some organisations and institutions such as national armies, plants that deal with toxic and flammable products and institutions such as surgeries that deal with human life for example apply autocratic or authoritative leadership style due to the security, safety and fragility considerations. In the majority of cases, adopting and applying transformative and latest innovations in management and leadership styles assist to improve operations and empowering employees (Deveau & McGill, 2014; Chang & Lee, 2013).

Leadership and Management in Higher Education

Universities have a hierarchical structure of management and leadership (Department of Higher Education and Training [DoHET], 1997; 2001). The highest institutional governance structure is the university council that is led by a chairperson and constituted by members representing various internal structures and governmental and industrial representatives. The senate follows in the line of organs and it makes recommendations for council approval and endorsement. The Vice Chancellors work with representatives of all the interested parties such as academics and support staff. He also manages by the assistance of workers unions, faculties, departments, centres, schools and student bodies such as the student representative councils in the senate to ensure the smooth running of universities. Faculty and departmental boards that are chaired by Deans and departmental heads facilitate the smooth running of faculties and departments at lower levels (DHET, 2012).

The Faculty of Engineering and the Built Environment (FEBE) is one of the several faculties within the University of Johannesburg. It has about five schools and several departments and has several thousand undergraduate and postgraduate students. The Department of Town and Regional Planning (DTRP) at UJ is one of the several departments that fall within FEBE. The department falls within the School of Civil Engineering and the Built Environment (SCEBE) that is one of the five schools within the faculty. The author leads and manages the DTRP in the capacity of Head of Department (HOD) hence he has constant interactions with the management and leadership of FEBE. The FEBE is managed and led by an Executive Dean (ED) who is supported by two Vice Deans (VDs) who report to him. One of the VDs is responsible for teaching and learning activities whilst the other one is responsible for post

graduate studies, research and innovation. The SCEBE is managed and led by the Head of School (HOS) who reports to the two VDs. The HOD of DTRP reports directly to the HOS of SCEBE but has also direct interactions with the ED of FEBE as well as the two VDs.

Theoretical Framework

Leadership and management that is responsible, accountable, fair and transparent in organisations in general and higher education in particular is open, interactive and collective. This work deploys the collaborative planning theory that emphasis communicative, collective and genuine consultative actions in organisations. The collaborative planning theory is built on the process of bringing together all relevant participants to work towards shared goals and innovative approaches when faced with mammoth and challenging issues (Healey, 2003). The idea of collective action embedded within collaborative planning makes the theoretical framework very relevant in managing and leading higher education institutions. According to Innes and Booher (1999) the collaborative theory promotes consensus among relevant stakeholders who agree to strategies that contribute to problem solving. This view is also supported by Kumar and Paddison (2010) who contend that to attain common goals, participants must willingly work together in the process sharing responsibilities. The collaborative planning framework advances that stakeholders adapt and orient their plans and actions to achieve common goals. In complex, diverse and interdependent environments such as higher education institutions, collaborative planning promotes satisfactory results (Windischer, Grote, Mathier, Martins and Glardon 2009). According to Harris (2002) building common understanding among stakeholders help to ensure co-operation towards the attainment of great achievements. There is therefore need to conscientise, educate and train leaders and managers in higher institutions to work collectively towards common goals, hence the framework greatly helps to improve understanding and action (Danese, 2011).

Research Methodology

This article involved an orderly investigation of the teaching and research leadership and management styles in the FEBE at UJ.

Research design

The work adopted the case study research design to shape the process of investigating the role of leadership and management in academic performances. It also facilitated the understanding of experiences (Creswell, 2006) of staff members and students within FEBE. According to Babbie and Mouton (2001), case study research designs assist in identifying the target population and to conduct data collection, analysis, interpretation and reporting.

Research approach

The qualitative research approach was applied to gather rich data from a small sample of respondents who were purposively sampled as they had unique and relevant information for the study (Magudu & Gumbo, 2017).

Data collection

First, a comprehensive and intensive review of literature was done to generate distilled key concepts and theoretical frameworks (Rossman & Rallis, 1998) that are essential in leadership and management for teaching and research purposes in higher education purposes. Second, primary data was gathered from 10 staff members and 20 students. Staff members and students were purposively approached and semi-structured interview questions were shared with participants. Open ended questions (Schaeffer, Dykema & Maynard, 2010) that mainly focused on the leadership and management styles that are commonly practised by the Dean, Vice Deans, Head of Schools and Heads of Departments within the FEBE were asked to participants. Some of the questions focused on the role of leadership and management in teaching and research performance in the faculty. Participant observation and personal experiences were also used to compile more data for the study as the author is one of the lower level managers within the FEBE at UJ.

Data analysis

The work also used mostly document, content and statistical analysis. Archived data from annual reports for the FEBE and online data systems such as HEDA and HEMIS were accessed to determine the academic performance trends in the last five years Content analysis (Leedy & Ormrod, 2010) was used to analyse the data, starting by combining the responses and generating meanings from the various responses. Common responses were then grouped into categories. The identified categories were developed into themes that represent leadership and management styles within the FEBE and how they have impacted on teaching and research performance during the past five years.

Validity and reliability

Triangulation of data collection methods was used to ensure the validity and reliability of the data collected. The same questions were asked staff members in different departments of the faculty as well as students. The statistics were checked and verified from different sources. Permission was sought from the relevant university officials within the faculty to speak to the leadership of the faculty, staff members and students. Informed consent was sought and data was collected only in situations where participants consented to the study.

Results and Discussion

The study revealed that four traditional management and leadership styles are commonly applied at differently levels within FEBE. The styles are blended with the transformational leadership and management approaches. The four are the autocratic; the transactional; the participative and the laissez – faire styles. All the four different types of management and leadership have their own share of strengths and shortcomings which show as the styles are implemented in practice. There is therefore need for a balanced blend and flexibility in their use responding to the prevailing situation (Bush & Middlewood, 2013).

Laissez-faire management and leadership style blended with the transformative style

The research revealed that the laissez – faire management and leadership style is commonly practised by the Head of School (HOS) of Civil Engineering and the Built Environment

(SCEBE). The school is composed of four teaching departments that are led and managed by Heads of Departments (HODs). In the majority of cases, the HOS gives sufficient opportunities to his HODs to conduct their academic businesses and rarely micro manages them. The HODs have ample time to focus on their departmental duties and demands of the office. In very rare occasions, the HOS sends emails to the HODs or calls for meetings; for example when there are high level engagements with external stakeholders, or opportunities to respond to calls for funding. There are opportunities to get feedback from the HOS and also to update him about the developments in the departments such as Technological Programme Committee (TPC) meetings or FEBE meetings. The HOS administers the budget for international travel for conference purposes. Applications for international travel by staff members are approved by the HODs first before they are signed off by the HOS. He effectively and efficiently handles these duties consequently the majority of staff members within the school are very positive and motivated to work. Research outputs have been rising and teaching and learning has also been improving as depicted by the ever rising undergraduate and postgraduate throughputs. The HOS holds postgraduate seminars for his SCEBE staff, on very rare occasions, raising concerns on about the processes and management of post-graduate proposal development and submission to FEBE committees such as the Faculty Higher Degree Committee (FHDC). In such situations, junior staff members that require mentorships rely on departments rather than the school. This is a sharp contrast to what happens in the other schools where meetings are held frequently for research purposes.

The style of leadership and management by the HOS is a laissez – faire. The style has had its own share of weaknesses particularly on the new HODs who have very little knowledge and experience of managing and leading departments at institutions of higher learning. The new HODs have in most cases struggled on their own, getting very little support and coaching on how to deal with academic and non-academic staff members and students. This has resulted in frustrations leading to delayed decisions making as the new HODs find themselves doing more managerial tasks than necessary and less of leadership duties to their departments. In some cases service provision to both the students and staff members becomes poor due to the application of the laissez-faire management and leadership style. It however goes without saying that several transformative efforts have been implemented within the SCEBE. The innovative interventions have been implemented to prepare for the visits by professional bodies that regulate and accredit programmes across all the departments within the school. There have also been several innovative infrastructural upgrading, innovative new programmes development and staff recruitment and support. In the majority of cases the HODs have been meeting the strategic objectives as they are trained within the respective fields they are managing and leading. HODs have also been managing to do their tasks at their own pace with distant supervision from the HOS thus raising the morale for the majority of the HODs leading to high productivity and high quality service provision (Innes & Booher, 1999).

Transactional management and leadership style blended with the transformative style

The work also highlighted that the transactional management and leadership style is commonly practised by the Vice Dean (VD) for post-graduate studies, research and innovation. The VD chairs Faculty Higher Degrees Committees (FHDC) and Faculty Research Committees (FRC) to oversee postgraduate studies and research publications respectively. The VD engages his subordinates actively and encourages them to publish journal articles, books, and book chapters and also attend conferences for the purposes of developing, presenting and generating peer reviewed conference papers. He uses mostly the research funds and possibilities of promotion to encourage the participation of staff members. Staff members are also encouraged to engage in patented research to receive recognition, rewards and promotions. The financial incentives are used to conduct more research and conferences attendance. It was revealed that there are some employees that either hate research or are not doing well in research as a result they specialise in teaching and learning. This results in very low or no research outputs at all. Such employees do not receive either the financial incentives or get promoted easily, consequently they remain in their positions for years. This results in their demotivation, such that even their teaching and learning specialisation suffers as they give up on their area of speciality due to very little rewards that are attached to teaching and learning. In the majority of cases tasks and targets are set for employees but there are few support opportunities to those that are struggling to get started in their research and with limited experience in supervising post graduate students. The emphasis on rewards has put the few active researchers to do more and more to continue receiving rewards thus creating fatigue and the production of substandard journal articles, books that no one reads and several conference proceedings that are of no value to policy making.

Several transformational efforts have been instituted to support post-graduate studies, research and innovation activities within FEBE. Consequently, the FEBE has managed to surpass not only its expectations but that of the UJ, as both research and postgraduate outputs have been trebled during the past four years (Figure 1).

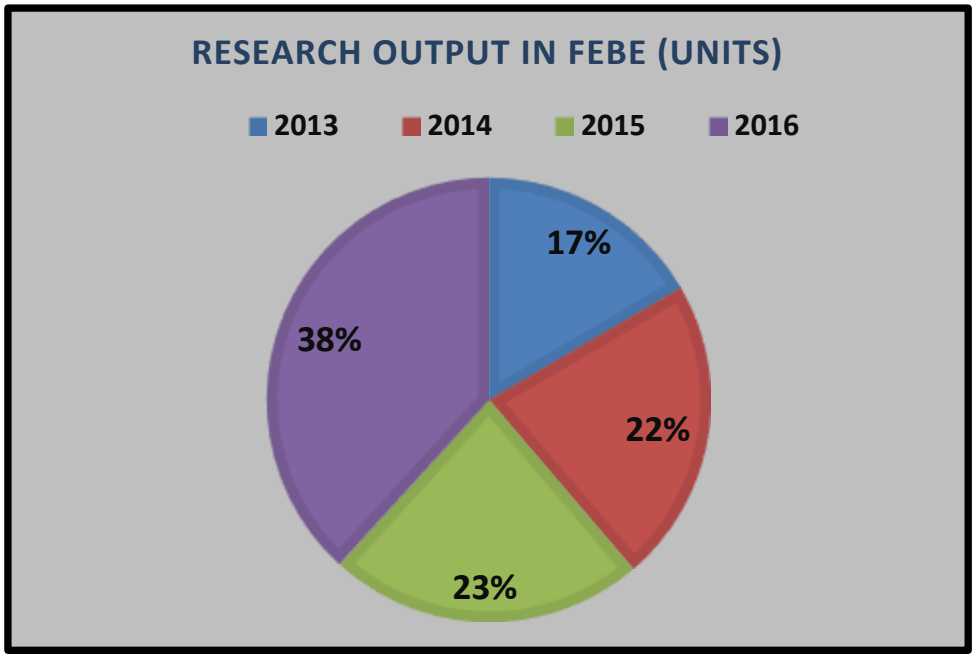

Figure 1: Research outputs for FEBE between 2013 and 2016

The research output has been increasing from 157.39 units in 2013; 210.76 in 2014; 218.58 in 2015 and 363.20 units in 2016. The units are calculated from the journal articles, reviewed conference proceedings, books and book chapters that are submitted to DHET and audited every year. The VD has scored several positives within the FEBE in the last few years. Employees have been benefitting from the arrangements and transactions created over the years. Staff members that are productive in publications and in graduating students have been rising the ladder from lectureship positions to senior lectureships and from senior lectureships to Associate Professorship and also from Associate Professorship to Full Professorship (Marshall, Orrell, Cameron, Bosanquet & Thomas, 2011). The VD has also been scouting for staff members to join mentorship programmes, where they are paired with seasoned researchers. There have also been efforts to support and motivate staff members to apply for research funding from the UJ's University Research Committee (URC) and the Faulty Research Committee (FRC); various government institutions such as the National Research Foundation (NRF), private and international organisations and initiatives such as the Horizon 2020. Junior staff members are encouraged and supported to register for post graduate studies such as Philosophy degrees (PhDs).

Autocratic management and leadership style blended with the transformative style

The work also revealed that the autocratic management and leadership style is in operation in the FEBE through the VD for teaching and learning. The portfolio is huge and demanding as it involves the management of student enrolment, admissions and registrations; the setting of timetables for classes, determining and maintaining programme and module content. The responsibilities also include the management of the adoption and use of appropriate teaching philosophies and strategies, learning and study guides development. The VD also manages the setting of examinations and moderation of question papers, assessment strategies,

teaching and module evaluations, processing, moderation and finalisation of results. Given the complexity of the portfolio and its sensitivity the VD commonly makes decision with minimal consultations and participation of subordinates. Standards are set and orders given to staff members with the help of the Head of Faculty Administration (FHA) and other managers. Consequently, teaching and examination timetables, examinations regulations and requirements are enforced on employees through HODs. The same applies to submission dates of question papers and results that are communicated to employees with the assistance of FEBE support staff members. The VD chairs Technological Programmes Committees (TPCs) and Engineering Science Programme Committees (ESPCs) of HODs. These committees deliberate on teaching and learning challenges but very little is resolved and through such meetings. There have been concerns from both staff members and students with regards clashing modules on timetables and smaller venues for classes, inadequate time that is given to complete tasks as students and staff members are given tight deadlines that are sometimes not feasible. Student enrolments are sometimes either over or below the required numbers due to over control of the processes which gives HODs very little control.

They have been transformative actions taking place in the past few years. The use of live online systems such as HEDA that show the real time data and numbers of students that are registering for a programme, have been helping to monitor the student numbers (Figure 2). The numbers of students enrolment have been increasing over the years from 8380 in 2013; 8686 in 2014; 9160 in 2015 to 9617 in 2016.

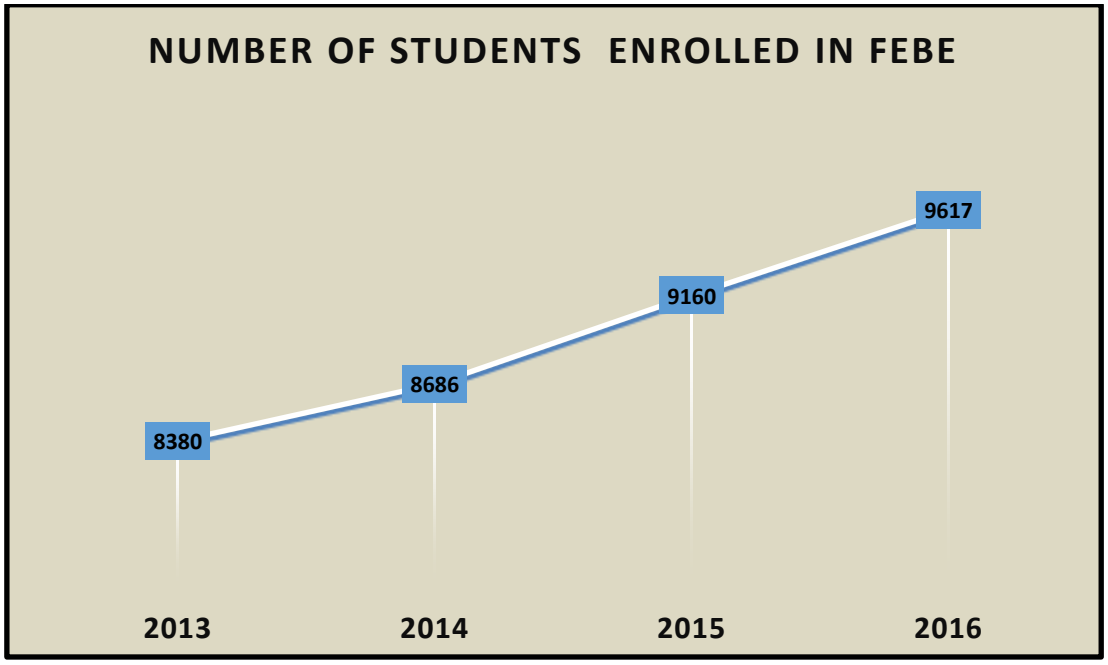

Figure 2: Enrolment numbers for FEBE between 2013 and 2016

There have also been innovations in the management of results through the MAMS platforms that assist in harmonising the processes. The system is being used to effectively trace the

performance and progress of students resulting in better management of graduate outputs. Lecturers, HODs and HOSs perform to their best to meet the set deadlines and expected quality standards. The success stories could be credited to the use of authoritative leadership style (Danese, 2011) that is blended with transformative traits. However great care is needed to ensure that highly organised and self – managed employees who meet their deadlines without the need of constant email and notice reminders are not frustrated and in-turn demotivated by strict controls. The use of predetermined processes and set standards also need to be relaxed in some instances to promote and ensure creativity of academic staff who try out innovative methods of teaching and assessments. Setting strict timelines for results moderations and submissions leave departments with no time to convene meetings to consider results and moderate as teams, hence there is need to look into some of these concerns as the faculty continues to transform itself.

Participative management and leadership style blended with the transformative style

The work has also demonstrated that the participative management and leadership style is applied by the Executive Dean (ED) of FEBE. He engages his Vice Deans (VDs), Heads of Schools (HOSs), Heads of Departments (HODs), Heads of Centres and stations (HOC/S), leaders of administrations and all academic and support staff members using a variety of platforms. Managers and staff members are strongly encourage to actively participate in decision making within their respective units. The ED actively engages his managers through FEBE breakaway meetings as well as Faculty executive Committee meetings (FExCo) thus ensuring active and committed leadership in issues that pertain the faculty. The Faculty Board meetings that are attended by all academic staff of the FEBE and chaired by the ED is one platform where staff members are accorded opportunities to actively participate in the affairs of the faculty. Staff members participate in the appointment of key personnel in positions of authority from VDs, HOSs to HODs through nominations either during faculty board or departmental board meetings.

There have been several changes within the FEBE in terms of approaches and strategies to grow research and publications, innovations, teaching and learning and participation in committees of the FEBE. In such scenarios employees develop a sense of ownership of the faculty, its operations and successes (Kumar & Paddison, 2010). The transformative systems have led to impressive results with regards the two key strategic objectives, teaching and research during the past five years. As depicted in Figure 3, the graduation figures have been rising over the years; from 1868 in 2013; 1887 in 2014; 1900 in 2015 to 2229 in 2016.

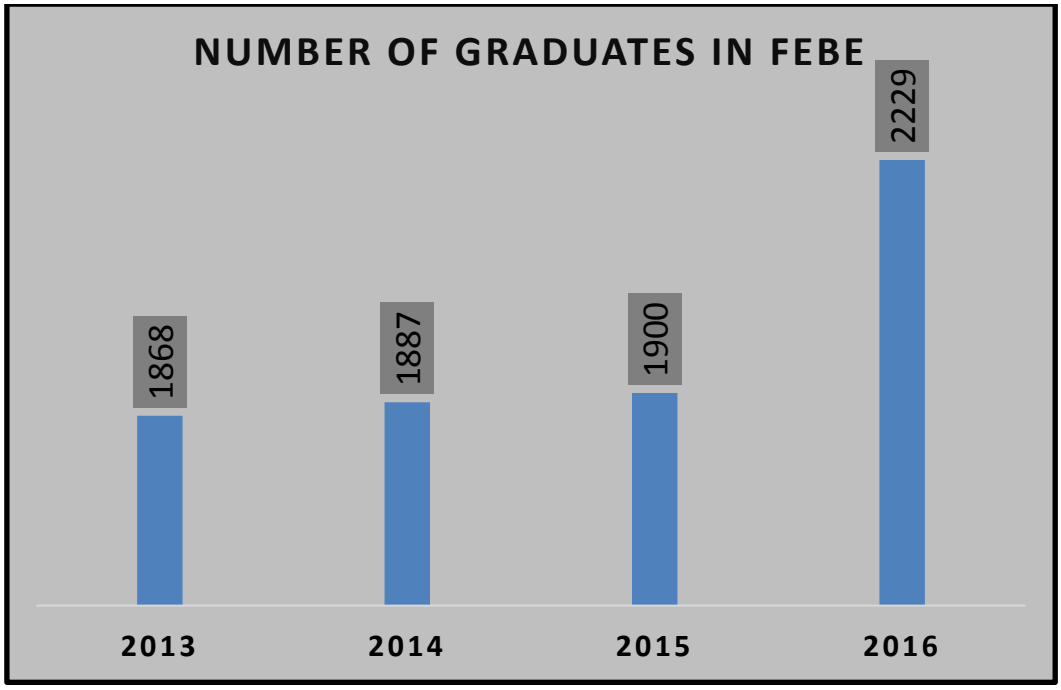

Figure 3: Number of graduates in FEBE between 2013 and 2016

The FEBE has been one of the most productive and well performing faculties of engineering not only at the UJ but within the entire Republic of South Africa. The faculty has also been at the forefront to develop undergraduate degrees programmes and to phase out diplomas and BTech not only in the university but also in the country. New postgraduate programmes have also been developed and will be finalised in time for the graduates of the new undergraduate programmes to further their education.

Although consultations are robust during meetings, staff members have no say on the final decisions that are made. It is the ED and other top university structures that make the final decisions in the majority of cases. There is also the challenge relating to lengthy decision making on issues that matter. A classic example has been the adoption of possible ways of decolonising the engineering curriculum. Deliberations have been ongoing as employees continue to disagree the definition of decolonisation itself, the character or structure or outcome of decolonisation and lastly the implementation approaches. Non-performance by a few employees has been another challenge within the FEBE as some staff members take advantage of the persuasive management style. In such situations there is need for the intervention of human resources to resolve the sticky issues (Okçu, 2014). In some instances participative approaches alone do not work but a blend of styles brings effective results.

Conclusions and Recommendations

The article discussed the four different management and leadership styles that include the autocratic, transactional, participative and laissez-faire, of course blended with the innovative transformative style. Whilst several efforts have been implemented to achieve the strategic objectives of the FEBE, a lot still needs to be done to take the FEBE to yet another level. All the four managers and leaders within FEBE, would need to complement their current

management and leadership styles by borrowing bits and pieces from almost all the relevant existing styles. More so, the managers and leaders would improve their operations and achieve their objectives much better by adopting diversity management and transformational leadership. The four mangers would do well by recognising that there are demographic differences. These include aspects of race, nationality, ethnicity, age, experience and gender. There are also socio-cultural differences that include values, morals, religion and political beliefs and affiliation and lastly individual differences that include personality, skills, knowledge and experience. All these need to be considered and factored in when adopting the ideal management and leadership style. The four leaders would be able to inspire and shape the future of their employees using idealised influence, intellectual simulation, inspirational motivation and individualised considerations. These actions assist in creating common goals, visions and missions among employees; reasoning in problem solving, a sense of awareness and developing a common purpose for the future.

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FACTORS CONTRIBUTING TO THE RISING NUMBER OF LEARNER ABSENTEEISM IN RURAL PRIMARY SCHOOL

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Abstract
This study explores learners' absenteeism in rural primary schools in selected schools in Ngaka Modiri Molema District. Participants were 65 in all comprising 13 principals, 13 teachers and 39 parents some of whom were school governing body (SGB) members. There were 31 women and 34 men with ages ranging between 21 years and 55 years (M = 35.4; SD = 9.6). Participants indicated their views about the causes and effects of absenteeism in rural primary schools on a Likert type scale. As the scale was author developed, validity and reliability of scores from the scale are reported. Results indicated that three subscales emerged, where participants saw the causes of absenteeism as (a) the lack of knowledge of the importance of education by parents (b), Heavy homework given by teachers and (c) Poverty. Further, in spite of the powers given by governmental authority, school stakeholders felt that parents of learners and educators are largely responsible for rural primary school learners` absenteeism. It is recommended that further studies should be conducted to determine the usefulness of the questionnaire used here in other contexts and samples.

Keywords: Absenteeism, Rural Areas, Learners, Primary School

Introduction
In South Africa learner absenteeism as a challenge is covered by the South African School Act, nonetheless the Act does not necessarily define the term learner absenteeism. The Act merely provides an explanation of absenteeism in the South African school context. Learner's absenteeism is defined as temporary away from the school when his/her presence is expected Bond (2004). Learner absenteeism is a serious hindrance to effective professional practice (teaching and learning) and thus a clear definition of learner absenteeism in South African school context is called for. It has to be stated that absenteeism on the side of the learner can be in two forms. It may be authorized or unauthorized. Authorized absenteeism refers to absenteeism that may be authorised by the school and/or parents. Bond identified three dimensions of absenteeism: truancy, condoned absenteeism, and school refusal, whereas the Auditor General Victoria identified four major dimensions of absenteeism: truancy, school refusal, school withdrawal, and early leaving. It is important to identify the different dimensions of absenteeism in tackling the problem because they may require different interventions. Unauthorised absenteeism refers to absence from school for reasons that are generally not known to the school or parents or both or to particular behaviour by learners – such as truancy The Auditor General Victoria (Auditor General Victoria, 2004) describes

truancy as: the persistent, habitual and unexplained absence from school of a child of compulsory school age, although it can occur with parental knowledge and sometimes consent. However for the most part truant students tend to spend their time away from school and home; time away from home is used to conceal absences from their parents. Truancy can take the form of fractional truancy, where students arrive late, leave early or skip individual classes. It has to be stated that there are lots of authors have their own description of truancy. According to Cunningham (2005), truancy is the absence of a student from school without the knowledge or permission of parents. The truant leaves home under the pretence of going to school but turns away and become involved in out-of-school activities. Truancy is unauthorized non-attendance. Bond (2004) included fractional truancy, which occurs when students arrive late or leave early, or spend entire days away from school. Absenteeism may also be full or partial. Partial absenteeism may be seen in situations whereby learners come to school early in the morning and leave the school in the morning after meals are served or come to school when the school is about to knock off with the aim of taking part in the extra-mural activities.

Literature

Absenteeism is a habitual pattern of absence from a duty or obligation (Bendel, Halfon & Ever-Hadani, 1976). It is also seen as a loss of days or absence from school work. In school terms it is viewed as the failure of the learner to report for study when he is scheduled work. The basic principle that the National Department of Education emphasises in its policy documents relates to the improvement of access to basic education, as well as free and quality basic education for all (Department of Basic Education [DoE], 2003). School refusal differs from truancy in that children refuse to attend school even in the face of persuasion and punitive measures from parents and school. These students stay at home with the knowledge of their parents and school administrators (McShane, Walter, & Rey, 2001). This form of absenteeism is widely associated with social and medical disorder involving persistent non-attendance at school, excessive anxiety, and physical complaints (Auditor General Victoria, 2004; Bond, 2004). This type of absenteeism can be separated from the other types, given its psychological and/or medical composition. Several studies show that school refusal is an important dimension in understanding students' absenteeism (Dube & Orpinas, 2009; Kearney, 2007; McShane, Walter, & Rey, 2001). For example, Dube and Orpinas noted three reasons for students' refusal to attend school: 17.2% of their participants refused to go to school to avoid fear- or anxiety-producing situations, to escape from adverse social or evaluative situations, or to gain positive tangible rewards; 60.6% missed school to gain parental attention or receive tangible rewards (positive reinforcement); and 22.2% had no specific reason for not attending school. School withdrawal: is when children are absent from school because their parents keep them away from school on a frequent basis because of the parents' needs and priorities. For the most part, these children's parents do not enrol them at school (Auditor General Victoria, 2004). Studies suggest that the factors influencing students' absenteeism at the primary level can be classified into medical and non-medical (Bendel, *et al.* 1976); or four broad categories: home and family, school, community, and personal characteristics of the

students (Etsey, 2005; Withers, 2004); or two broad categories: school factors, and family and personal factors (Bond, 2004). Rural South African Background and Basis of the Study

The constitution, the South African Schools Act and various education policy documents say that all South African learners should have access to the same quality of learning and teaching, similar facilities and equal educational opportunities. The term 'rural' is ambiguous, and distinctions between rural and urban tend to be arbitrary and varied. Rural areas are characterised by various factors that negatively influence the delivery of quality education. . In South Africa, colonialism and apartheid left an indelible print on all aspects of rural life through land dispossessions, resettlement policies, and systematic exclusion from opportunities to improve personal and social well-being that made poverty the most endemic characteristic of rural areas. South Africa is divided into nine province s with the aim of making the whole country governable. Some of these provinces are seen to be mostly urban while others are rural. Provinces with large rural communities are increasing in relation to the wealthier provinces. Also, provincial education departments have been encouraged to spend boldly on school funding norms allocations and to aggressively increase spending on capital and infrastructure. However, these measures have reduced but not eliminated inequities between historically advantaged and historically disadvantaged schools, and above all between schools in rural and urban areas.

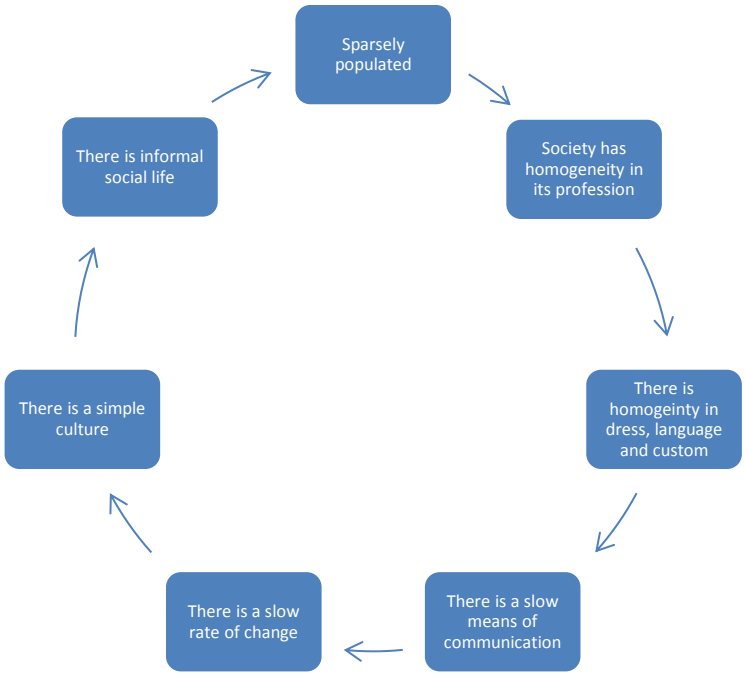

Figure 1: Common characteristics of rural communities

There is still a need to attain equity between the rich urban and poor rural schools. Equity may nevertheless not be an attainable goal using current modes of determining provincial and Intra-provincial allocations to schools. One reason for this is that personnel budgets remain too high, constraining levels of expenditure on non-personnel, development items. In

addition, many rural communities lack the professional help and support, governance structures, books and learning materials that they need to provide the necessary parental support and care for their children. It is against this background that this research was conducted. This background on its own paints a picture of how life is in rural South Africa.

Statement of the problem

The present focus in the education at the school, district, provincial and national levels is learner performance and a high pass percentage. Primary schools are seen as the first formal education platform for young learners after attending the early childhood centres. It is at this stage that the child starts the formal education. Attending all classes is seen to be very important at this stage since this is seen as the foundation for education. Having stated the above, it is not always the case to find learners attending school regularly. Learner absenteeism is seen to be growing hence this study. It should be pointed out that the said cannot be achieved if learners are not attending the school regularly. (Department of Education, 2014). This study is conducted in a deep rural area of the North West province and it is therefore important for the researchers to look at the reasons for the increase and also to look as to whether these reasons for the increase are universal or are only found in this area.

Figure 2: Common causes of absenteeism in rural primary schools. (Adapted from Nair. 2010)

The purpose of the study was to investigate the incidence of learner absenteeism in the rural primary schools of the North West province. It is about the reasons why learners absent themselves from schools. Absenteeism is a period of time when a student does not attend school (Teasley, 2004). Learner absenteeism is a problem within school systems involving all

ages and there is little evidence that attendance rates are improving (Reid, 2003). The issue of school attendance affects all schooling levels, be it the early child learning centre, primary school and secondary school. Absenteeism increases with each grade level and students gradually become more disengaged from school (RI Kids Count, 2007). When students are absent from school there are a wide range of short term educational consequences that they face. If a child absents himself or herself that learner stands a chance of losing a lot of school work covered on that day. This means that learner absenteeism works totally against the aims of schooling since when one is absent; the whole days` school work is lost to the learner.

Research question

The main research question of this study therefore is: what are the factors contributing towards the growing number of learner absenteeism in rural primary school? To answer this question, two sub-questions were used in one-on-one interviews with the participants. The sub-questions were: *(i) Which factors should be associated with the growing number of learner absenteeism in rural primary schools (ii) What are the perceptions of principal, teachers and parents towards the primary school learner absenteeism.*

In this regard the objectives of the study were therefore to:

(a) Explore factors associated with the growing number of learner absenteeism in rural primary schools.
(b) Find out the perceptions of principals, teachers and parents on rural primary school learner absence.

Method

Participants

The targeted population comprised of teachers, principals and parents from Ngaka Modiri Molema district of the North West province. To select participants, simple random sampling was used. The first aim was to select a sample of approximately 10% of the schools in the population. The 10% was seen to be an ideal number considering that the population of 128 schools would in essence have meant that there were 2 378 eligible participants. That number of participants would be difficult to reach. In selecting the 10% of the schools a table of random numbers was used and 13 schools were finally included in the study. Specifically, each school was given a number ranging from 1 to 128. The numbers were then defined in the Research randomizer (2011) which generated different sets, and set 5 was selected. In selecting the 13 schools, this meant that automatically the 13 principals were selected. In selecting teachers from each school, the researcher assigned numbers from 1 to *n* (where *n* was the number of teachers in a particular school) and the Research randomizer (2011) was used to select one. Three parents representing each school were also selected in a similar manner as the teachers. This means that the sample was made up of 65 participants, comprising 13 principals as well as 13 teachers and 39 parents. Participation by all

individuals was voluntary because the purpose of the study was clearly explained to all possible participants. All questions and queries were addressed to their satisfaction.

Instrument and procedure

In this study both qualitative and quantitative methods of collecting data were utilized. In essence this was a mixed methods study. It is averred that the goal "…of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies ... " (Johnson, & Onwuegbuzie, 2004, pp. 14 - 15). In a similar vein, it has been pointed out that when the two methods are used in combination, the weakness of one could be balanced by the strength of the other (Breakwell & Millard, 1995). The aim of utilising both qualitative and quantitative methods here was to use these as some form of triangulating findings. This means that one method was used in some aspects of the study to verify and corroborate participants' assertions and views in the other method. A questionnaire comprising two sections was used to collect data. The first section requested the participants to provide biographical data in terms of age, gender, highest academic qualification and work experience. The second section determined the views of participants on causes of learner absenteeism in rural primary schools.

Validity

Validity refers to the capacity of research techniques to express the essential features of concepts being studied, and to measure what the methods were intended to measure (Leedy & Ormrod, 2005). In a qualitative perspective, validity may be defined as "a contingent construct, inescapably grounded in the process and intentions of particular research methodologies and projects" (Winter, 2000, p. 1). To ensure the validity of this study we ensured that all processes were consistent. For instance, we asked the same questions consistently to participants. We ensured that our views were not expressed whatsoever even when participants asked for these. We simply indicated to them that it was their views we wanted not ours.

Reliability

Reliability refers to the degree to which a measure yields consistent results (Leedy & Ormrod, 2005). It is worth to point out that reliability from a quantitative perspective is different to how it is defined from a qualitative context. It is argued that reliability is a concept to evaluate quality in a quantitative study with a "purpose of explaining" while the quality concept in a qualitative study has the purpose of "generating understanding" (Stenbacka, 2001, p. 551). To ensure reliability in this qualitative study, a number of activities were followed. For instance, to ensure that whatever the participants said was correct, we took the transcripts to them for their verification.

Results

Biographical data

Participants were 65 teachers, principals and parents. Table 2 shows the biographical data that the participants were requested to provide. It may be observed from the table that the majority of participants were men. Participants' ages ranged between 21 years and 55 years (*M* = 35.4; *SD* = 9.6). The table further reveals that the majority (56.9%) of the participants had completed either a diploma or a degree and higher. It is worth noticing that most of the teachers (53.8%) had teaching experience of 9 years or less. Where the teaching experience ranged between 5 years and 21 years (M = 11 years; SD = 4.9). With respect to parents, a majority (66.7%) had work experience as SGB members of 15 years or more where experience ranged between 5 years and 22 years (M = 14.3 years; SD = 5.4).

Table 1: Biographical information of the participants (N = 65)

Category		N	%
Gender			
	Women	31	47.7
	Men	34	52.3
Age			
	20 – 29	27	41.5
	30 – 39	13	20.0
	40 +	25	38.5
Highest academic qualification			
	Grade 12	28	43.1
	Diploma (e.g. Diploma in primary education)	22	33.8
	Degree or higher(e.g. B.A. or B.A. Honours)	15	23.1
Position held in school			
	Educator	13	20.0
	Principal	13	20.0
	Parents	39	60.0
Teaching experience (Teachers)			
	5 – 9	14	53.8
	10 – 14	4	15.4
	15 - +	8	30.8
Work experience of parents as(SGB Members)			
	5 – 9	13	33.3

10 – 14	6	15.4
15 - +	20	51.3

Views on causes of learner absenteeism in rural primary schools.

In establishing the reliability of the views about the causes of learner absenteeism in rural primary schools Cronbach's (1951) alpha as a measure of the internal consistency of scores obtained from the scale was computed. To establish the validity of the views on causes of learner absenteeism in rural primary schools (VCLARPS) two processes were followed. Firstly, the internal consistency of scores from the questionnaire were determined and the value of alpha was found to be .75 [95% CI: α = .65 - α = .83]. This alpha value was adjudged to be fair since it is greater than .70 and less than .80 (Ciccheti, 1994). So participants' scores on the VCLARPS were adjudged to be reliable. Regarding this issue the researcher had four rating points for the scale namely, 4 = Strongly Agree, 3 = Agree, 2 = Disagree and 1 = Strongly Disagree. The academics suggested that a fifth rating point be added. The researcher duly added the rating point named 5 = I don't know.

In the original scale the researchers had divided the questions into four areas each with its heading. In doing this, the researchers thought that the questions were about (a) the lack of knowledge of the importance of education by parents, (b) Heavy homework given by teachers, (c), Poverty and huge syllabus (d). Finally, the academics requested a change in a few item statements. For example, an initial statement was: *The parents are ignorant of their responsibility to check and support their children when it comes to learning.* This statement was changed to read: *Lack of knowledge hampers active participation of parents in their children`s school work.* Content validity was further assessed through principal components analysis (PCA) which was computed with the aim of exploring the data. Firstly, a varimax rotated matrix with eigenvalues greater than unity indicated a five factor solution. This solution had a total explained variance of 68.1%. It was on this basis that a test of the internal consistency of the scores from each of the three factors was determined. The internal consistency scores of Factor 1 was .78 [95% CI: α = .69 - α = .85], for Factor 2 it was .72 [95% CI: α = .61 - α = .81] and for Factor 3 it was .69 [95% CI: α = .57 - α = .79]. So in essence the three factors were found to be fair and acceptable (Ciccheti, 1994). Because the three factor solution had reliable scores from the scale, content validity was also accepted based on findings of the exploratory analysis.

Table 2: Structure coefficients from principal components analysis of the views about causes of learner absenteeism in rural primary schools, three-factor model (N = 65)

	Factor		
	1	2	3
1. Quarrel with Parents about going to school	.824		
2. Quarrel with brothers and sisters	.738		
3. Not able to get money for pocket expenses	.663		

4. Parents do not check whether learners are attending school or Not	.654		
5. Lack of finance to purchase the required books, pens and pencils	.563		
6. Looking after the young children in the houses and helps the old persons	.503		
7. Not able to understand properly the lesson taught by the teacher		.769	
8. Partiality of teachers towards certain learners		.737	
9. Discouragement through frequent failures in the class		.713	
10. Disturbances around the school		.633	
11. Lack of facilities in the school		.539	
12. Not able to return the money borrowed from friends			.784
13 Lack of shoes			.775
14. Food served late at school			.738
15. Lack of neat clothes			.521
16. Lack of money to participate in group activities			.326
α	.78	.72	.69
Eigenvalues	3.7	2.7	1.9
Variance (%)	23.2	16.7	12.0

Views about causes of learner absenteeism in rural primary schools

An inspection of the items from principal components analysis led the researchers into naming the factors in terms of the principal as: *lack of knowledge of the importance of education by parents* (Factor 1, six items), *a heavy homework given by educators* (Factor 2, five items) and *poverty* (Factor 3, five items) of project management activities. The analysis of the views about the causes of learner absenteeism in rural primary schools, were based on the three established factors.

Lack of knowledge of the importance of education by parents

Table 3 shows the measures of central tendency and the standard deviations of the items statement relating to the lack of knowledge of the importance of education by parents. The table shows that the responses were consistently clustering around a score of four.

Table 3: Measures of central tendency and standard deviations relating to the six items of the lack of knowledge of the importance of education by parents (N = 65)

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
No response	5	5	5	5	5	
Mean	4. 20	4.33	4.13	4. 13	4.13	4.12
Median	4.00	4.00	4.00	4.00	4.00	4.00
Mode	4	4	4	4	5	4
SD	1.08	.68	1.00	.91	1.02	.94

In all the six item statements, a majority of participants agreed or strongly agreed that there was a lack of knowledge of the importance of education by parents. As an illustration of this contention, Figure 3 provides a rating of the item statement: learners feel that they are given a lot of work by educators*)*. It is observable from the figure that 86.7% were of the view that parents were not positively involved in the education of their children.

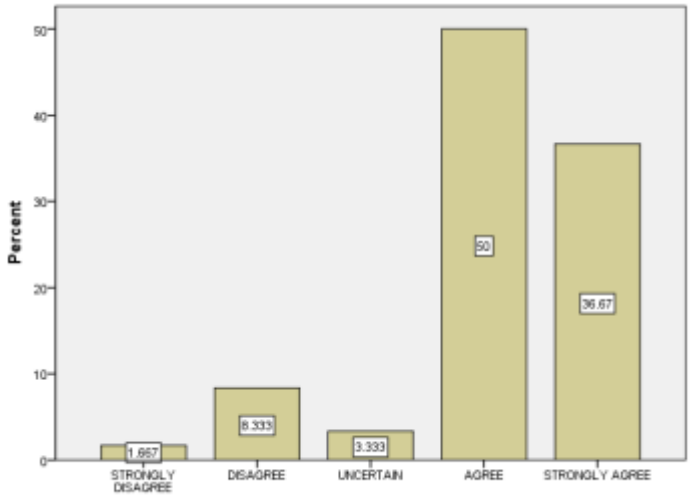

Figure 3: Percentage distributions of participants on an item lack of knowledge of the importance of education by parents

Table 4 shows the measures of central tendency and the standard deviations of the items statement relating to heavy homework given by educators as a basis of learner absenteeism in rural primary schools. Similarly as in the previous instance Table 4 shows that the measures of central tendency were around a score of four. In all the five item statements, a majority of participants indicated that they agreed or strongly agreed that poverty was the main reason for learner absenteeism.

Table 4: Measures of central tendency and standard deviations relating to the five items of heavy homework given by educators that are seen to be a cause for learner absenteeism in rural primary schools (N = 65)

	Item 1	Item 2	Item 3	Item 4	Item 5
No response	5	5	6	6	5
Mean	3.90	4.43	4.07	4.31	4.33
Median	4.00	5.00	4.00	4.00	4.50
Mode	4	5	4	5	5
SD	1.10	.72	1.10	.91	.86

Table 5 shows the measures of central tendency and the standard deviations of the items statement relating to poverty as a cause of learner absenteeism in rural primary school. The table shows that the responses were consistently clustering around a score of four. In all the five item statements, a majority of participants agreed or strongly agreed that poverty was the cause of absenteeism in rural primary schools.

Table 5: Measures of central tendency and standard deviations relating to the five items of poverty as a cause of rural primary school absence (N = 65)

	Item 1	Item 2	Item 3	Item 4	Item 5
No response	5	5	5	5	5
Mean	3.85	3.70	3.83	4. 20	4.12
Median	4.00	4.00	4.00	4.00	4.00
Mode	4	4	4	4	4
SD	1.26	1.25	1.25	.99	.92

As an illustration of this view, Figure 5 provides a rating of the item statement: Lack of finance to purchase the required books, pens and pencils. It is observable from the figure that 75.0% were of the view that poverty was a cause of learner absenteeism.

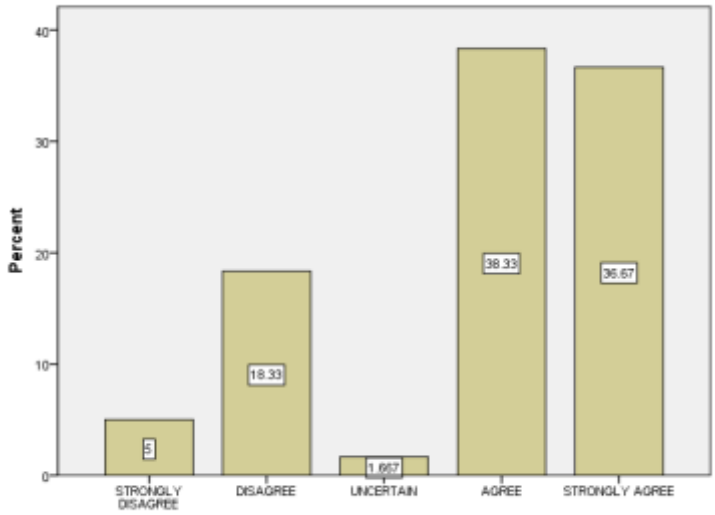

Figure 4: Percentage distributions of participants on an item about poverty as a cause of learner absenteeism in rural primary schools.

DISCUSSION

Respondents felt that educators expected a lot from learners. Excerpts from the interviews illustrate this. For example Respondent 6 answered the question by stating: "…*our children are given a lot of work that they don't know…my son cannot even go out and play after school due to the amount of homework given to him by the educator*". These sentiments were supported by Respondent 16 who indicated that "…*educators punish our children if they do not submit the work on time, as a result our children do not feel like going to school anymore*". Respondent 37 sentiments by stating that: "…*since we live in rural areas there is no means of transport, our learners travel for long distances and arrive home late and tired, there are even stories of bullying on their road from school to home, this, I believe is what makes my daughter not to attend school*". Another dimension that came out mostly in the interviews was the issue of poverty. This was highlighted by most respondents. On this issue Respondent 47 stated "…*our children comes from a disadvantaged background, there are a*

lot of economic issues that discourage learners from going to school issues like lack of shoes, distance from school, corporal punishment, no pocket money and Lack of parent guidance to solve the educational doubts" . One respondent on the issue of poverty indicated that most of the parents in rural areas did not have employment. This was due to the fact that they did not have identity documents.

Conclusion and recommendation

Given the above, researchers are of the view that this challenges needs a response from not only the department of basic education but also from department of social welfare. It is therefore recommended that schools should be places of happiness so as to entice learners not to be absent. The department of Home affairs should go to the people in rural areas to help them acquire identity documents. The Department of Basic Education (DoBE) has to enforce its rules that are against corporal punishment and the department of transport should provide school transport for learners in rural areas.

Limitations

It has to be stated that even if the sample of this study was randomly selected, the results presented here are mindful of the fact that schools may be in the same province but conditions in those schools cannot be the same. With hindsight the researchers feel that it would have added value to have interviewed the primary school learners. The researchers acknowledge this as a limitation because interviews may have illustrated what learners exactly meant in reporting that… *schools are hell* ...for example. It is worth pointing out that absenteeism in primary school is a vast field of study on its own hence this paper may not be seen as comprehensive in any way.

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TEACHER PROFESSIONAL DEVELOPMENT IN THE USE OF DIGITAL TECHNOLOGIES FOR TEACHING

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Abstract
The purpose of this study is to investigate teacher professional development in the use of digital technologies for teaching. The use of digital technologies for pedagogical purposes has been a major precedence for the Department of Basic Education in South Africa. Participants were 91 teachers from public secondary schools in Tshwane South District 4 in Gauteng, South Africa. Mixed method was used in this study. Data was collected by means of individual interviews and a survey questionnaire. Qualitative data were analysed manually using patterns, categories, codes and themes. Quantitative data was analysed by means of frequencies, tables, means and standard deviations. Findings revealed that despite having had several digital technology teacher professional development programmes (DTTPDPs) initiatives in the Tshwane South District 4, there was evidence of inadequate DTTPDPs received by teachers. There was lack of time; lack of support; and lack of effective planning for DTTPDPs particularly on the integration of digital technology in the curriculum. Results also shows that 75 (89%) of the teachers indicated that they would like to attend more of pedagogical DTTPDP related to the subjects that they teach to develop activities and assessments using digital technology to achieve the learning outcomes. It is recommended that the Department of Basic Education develop and implement effective DTTPDP strategies to urgently address current lack of time for meaningful and effective DTTPDs.

Keywords: Teachers, digital technologies; professional development programme; teaching and learning; pedagogy

INTRODUCTION

Digital technologies are electronic tools, systems, devices and resources that generate store or process data. These include social media, online games and applications, multimedia, productivity applications, cloud computing, interoperable systems and mobile devices. This is an expanded notion of technologies that recognises their development from mere information delivery systems and also clarifies their role in classrooms in contrast to their wider use across schools and learning centres (Cambridge International Examinations, 2015). These tools may be referred to as an extension of Information and Communication Technologies which encompass a range of hardware; software applications and information systems**.** Thus, the introduction of digital technology in education is expected to penetrate and transform teaching and learning across the curriculum (Hennessy, Ruthven & Brindley, 2013).

The significant usage of these technologies is expected to be considered in the classrooms on daily basis. However, this is a concern to the Department of Basic Education (DoBE) that its goal has not yet been achieved and that the White Paper on e-Education is still relevant (Mnisi, 2014). With that regard, the policy goal of the Department of Education (2004) states that every South African learner in the General and Further Education and Training bands will be ICT capable by 2013 (that is, use Information and Communication Technology (ICT) confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community). However, a disparity exists between the current availability and utilization of digital technology resources for teaching purposes in the classrooms in South Africa. Although schools rapidly acquired ICT hardware and infrastructure, teachers still complain and have a challenge about the quality of training provided to support the use of these tools (Moila & Makgato, 2014). The study emerged out of a need to investigate the current DTTPDPs status at the eight schools. Hence, the aim of this study is to investigate teacher professional development in the use of digital technologies for teaching. The survey questionnaire was also administered to gather quantitative data about the integration, the process and the effectiveness of teacher professional development in the use of digital technologies in secondary schools. The individual interviews were conducted to provoke thought and allow participants to express themselves in greater detail, thereby revealing more information that the researcher may not be aware of about the DTTPDPs. This study aimed at coming up with recommendations on more effective DTTPDPs that could make a positive impact on how teachers use these technology tools to facilitate teaching and learning.

CHALLENGES OF DIGITAL TECHNOLOGY IN EDUCATION

Lemke, Coughlin and Reifsneider (2009) argued that digital technology challenges include low-bandwidth technology which can be unreliable and break down at any given moment, and can be an obstacle for accessing the Internet. It is also argued that there is limited evidence to show that digital technology is improving learning outcomes for most students (Herold, 2016). This author further claims that teachers and parents alike have expressed concerns about digital distractions; most teachers have been slow to transform the ways they teach, despite the influx of new technology into their classrooms; and despite the desired outcome of the technological progress in schools, the implementation remains a major challenge. Smith (2015) reveals that schools are underfunded and teachers are undertrained, facing environments where the technologies they use are not always reliable. The results revealed some of the major digital technology as the limited budget; inadequate professional training; teachers' resistant to change; inadequate network infrastructure; unreliable device and software; no systems to use technology for curriculum; and district does not see immediate need for more technology as challenges they faced (Smith, 2015). Lemke, et al. (2009) opined that digital technology by itself is not likely to bring about reforms in schools, but can be a powerful tool for teachers and learners if it is made part of a comprehensive and systemic effort to change education. In this regard, digital technology is most likely to be widely adopted by teachers and schools if firstly, it supports already existing practices and helps to solve problems or address challenges. Secondly, it is part of a systemic,

organization-wide initiative. Finally, teachers have access to ample professional development and ongoing support (Lemke, et al., 2009). Currently, educational researchers collectively agree that merely introducing technology to the classroom without proper understanding of the underlying theoretical frameworks is not productive (Koehler & Mishra, 2009; Angeli & Valandies, 2013).

DIGITAL TECHNOLOGY TEACHER PROFESSIONAL DEVELOPMENT

The importance of the adoption and use of technology in school education should not be underestimate if teachers need to meet the 21st century skills. Shepherd and Mullane, (2010) stated that teachers are failing to integrate technology into their classrooms in meaningful and appropriate ways. In this case, teachers are progressively required to integrate digital technologies in their teaching and learning environments. Wachira and Keengwe (2010) revealed that federal agencies, national professional organisations, and teacher education agencies have voiced the need to prepare teachers to integrate technology into their teaching for decades.

By simply rolling out digital technology resources to schools does not lead to high-quality outcomes if teaching remains static. About this, teachers require ongoing opportunities to attain and refine the highly specialised skills needed to teach in innovative ways demanded by technology and a competency-based curriculum (Fayad, 2012). As a result, teachers, who are the change-drivers, could successfully deliver high-quality, interactive, and outcome-based teaching that is responsive and adaptive to the changing needs of our learners, our country, and our world. To be successful, technology-related initiatives must be systemic. To be systemic, DTTPDPs should provide teachers with ways to apply new learning directly to their teaching. One-shot workshops with little direct connection to the classroom or follow-up have minimal impact on teachers (Jaquith & McLaughlin, 2010). Effective professional development works around a teacher's schedule, includes ongoing coaching and active learning, along with specific integration of subject matter and collaboration with colleagues. As digital technology and communities change, schools and the mechanisms within them needs to improve teacher professional development and the use of digital tools in the classroom. To be effective, teacher professional development needs to become a spotlight of interest, attention, accountability and responsibility, not just of teachers, but of pre-service and in-service institutions, policymakers, education officials, and principals and all other stakeholders.

THEORETICAL FRAMEWORK

The theoretical framework grounded this study is based on the Expansive Learning and Activity Theory (EL and AT) postulated by Engeström (2001). Engeström (2001:137-138) argues that expansive learning theory relates to learning of new forms of activity as they are created. The EL and AT also involves the collective transformation, rather than individual learning. In the context of this study, the changes in DTTPDPs within the schools will transform the manner in which the teachers use digital technologies in their teaching activities. The five principles of Engeström revised activity theory are prime unit of analysis, multi-voicedness, historicity, contractitions as well as possibility of expansive transformation.

A collective, artefact-mediated and object-oriented activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis (Engeström, 2001). In the context of this study, the focus was on the effective use of digital technology *(artefacts)* for teaching and learning activities at the studied schools; which were explored to verify how these tools were implemented in relation to the 21st century educational expectations. With regard to multi-voicedness, an activity system is always a community of multiple points of view, traditions and interests. In this case, this study investigated the impact that multi-voicedness and the division of labour in DTTPDPs had at the schools. This was done through engaging participants at different levels and positions to get clarity about the current statuses of DTTPDPs and implementation at the eight schools. Historicity is the activity systems that takes shape and get transformed over lengthy periods of time. Their problems and potentials could only be understood against their own history. This study has investigated the history of these participants in terms of their DTTPDPs, hence levels of integration in their practices.

Contradictions play a central role as sources of change and development as they are historically accumulating structural tensions within and between activity systems. This study explored and sought to understand the correlation between digital technology policies, teacher professional development, infrastructure, accessibility and availability of resources in order to effectively eradicate or at least close the existing disparities. Finally, possibility of expansive transformations accomplished when the object and motive of the activity are reconceptualised to embrace a radically wider horizon of possibilities than in the previous mode of activity. In this case, this study will provide recommendations to all stakeholders, which were based on the findings. If these recommendations are effectively implemented by all stakeholders, then as expectation of the 21st century's goals, teachers will access high-quality teacher professional development and support so that students receive a high-quality education. Figure 1shows two inter-acting activity system as a minimal model for third generation of activity theory.

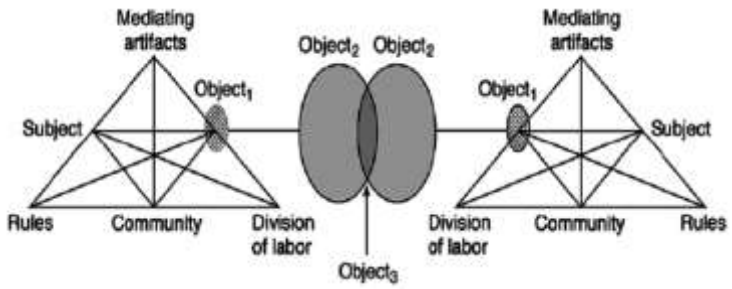

Figure 1: Two inter-acting activity systems as a minimal model for third generation of activity theory (Adapted from Engeström2001: 136).

RESEARCH QUESTIONS

The questions posed in this study are

- How is teacher professional development in the use of digital technologies in public school integrated?

- What are the processes of teacher professional development that influence the teachers' use of digital technologies in their teaching and learning practices?
- How effective are the initiatives and programmes incorporated by the DoBE and other stakeholders in integrating digital technologies in teaching and learning in schools?

RESEARCH DESIGN

Research design is the systematic process of collecting and logically analysing data for a given purpose (McMillan & Schumacher, 2010). This case study employed mixed method. Cases are bounded by time and activity, and researchers collect detailed information procedures over a sustained period of time (Yin, 2012). The study used both quantitative and qualitative approach. Data were collect were collected concurrently. Quantitative data was collected by means of a survey questionnaire. Qualitative data was collected by the use of individual interviews. The interview consisted of five questions. Typical questions that were asked were

- What was the levels of your digital technology proficiency?
- Did you attend some form of DTTPD?

Purposive and convenience sampling techniques were used to select the participants. Participants were 319 (13.5%) teachers from public secondary schools in Tshwane South District 4 in Gauteng, South Africa. However, 91 participants returned completed questionnaires and 24 teachers 3 from each school were interviewed. Data from survey questionnaires were analysed by means of frequencies, tables, means and standard deviations. Qualitative data from the interviews were analysed by reading repeatedly the transcripts in order to identify the patterns, categories and themes using relevant codes.

RESULTS AND DISCUSSION

QUALITATIVE FINDINGS AND DISCUSSTION

In Question 1 the teachers were asked to elucidate their levels of digital technology proficiency. Findings revealed that some of the participants indicated that they know how to use digital technologies and rated themselves as 8/10. Teacher Mokoena indicated that *I can use digital technologies but not interactive white board for teaching. I can rate myself8/10.* Teacher Sithole said *'Yes I do, 6/10. There is still room improvement.* Other participants revealed that they use mobile technologies and other technologies but they do not have experience of using it in teaching and learning. In this regard, Teacher Molakeng mentioned that '*I only use my personal cell phone and laptop but not for teaching*'. Teacher Dikobe said '*Yes I do, I am satisfactory because I still need to learn. I don't know how to prepare lessons on interactive whiteboard*'. The findings also show that some of the teachers did not have experience of using digital technology. In this case, Teacher Moole mentioned that '*No I don't have that experience with teaching and learning. I need to be developed*'. It may be argued that in digital age, schools need teachers who are ready to meet the challenges of teaching, learning, and working in a hyper-connected, collaborative, creative, and information-rich world (Fayad, 2012). These results are support in literature that teachers are

undertrained, not trained or not properly trained to use digital technologies in their teaching practises (Smith, 2015). In this regard teachers lack of digital technology skills for teaching.
In Question 2 teachers were requested to indicate whether they received some form of DTTPD. The findings show mixed feelings from the participants as others indicated that they did receive professional development in the use of digital technology but others did not. In this regard Teacher Mokena revealed that '*As far as I know, before the introduction of digital technology in Grade 12, there was a workshop during the school holidays, however after that, I never heard of any training and no one ever came to the school to train or support teachers on the use of digital technology for teaching and learning'.* Teacher Ndlovu indicated that '*There was some kind of training for five days. It was inadequate as I still need to be equipped on the use of digital technology.* Teacher Mohapa revealed that '*There was some kind of training which still needs to be improved on. It was just for a short time'.* Though other teachers received training they emphasised that it was ineffective and inadequate. About this Teacher Mabaso said '*Yes, we have, but it was not that effective as it took only 3 days, it was inadequate. We want an intensive teacher professional development. They were focusing theoretically on how to prepare using interactive whiteboard without practically being hands-on. Since we stayed for a long time before they installed interactive whiteboard in Grade 12 classrooms, we had forgotten how to use interactive whiteboard by the time they installed them in the classrooms*'. Other teachers have never received digital technology professional development. In this regard, Teacher Makitla indicated that '*Firstly, we have never received any training. Secondly, we have never received any digital technology resources. There are no interactive whiteboards in grade 12 classrooms. Teachers and learners are still using chalk, talk and textbooks for teaching and learning*'. Other teacher required more training. In this case, Teacher Lala indicated that '*Last year (2016), training was offered but support from DBE is still needed. Teachers from old school would not have grasped all the digital technology skills in that short time of training. We still need an intensive teacher professional development.* It may be seen from the findings that digital technology on its own is not likely to bring about reformation in schools, but it could be a powerful tool for teachers and learners Lemke, et al., 2009). Digital technologies are likely to be widely adopted by teachers and schools if could be uses to supports already existing practices and helps to solve problems or address challenges, Furthermore, teachers require to have access to continuous professional development.

In Question 3 teacher were requested to respond to question about the integration of digital technology in teaching and learning. Findings revealed that digital technologies in most of the schools exist but are not being used. About this matter Teacher Manana revealed that '*Tools are not being used, no cell phones for learners are allowed in class, computer labs not used, classrooms not well structured for digital technology usage in teaching and learning*'. Teacher Luvuno added '*Yes, only Grade 12 classes use digital technology, the rest is still using chalkboard and text books*'. Other teachers indicated that the limited use of digital technologies. About this Teacher Mokete said '*Minimally used by some teachers*'. The findings also revealed the generation gap in the use of digital technology in teaching and learning. About this Sepheko mentioned that '*I think younger teachers are, but the older*

teachers are refusing to move away from old way of teaching because they are not well equipped'. The language to the use of digital technology impacted negatively to the use as not South African official language were cater for. In this case Ma Masombuka indicated that '*Not all of us since some of the subjects are excluded, for example Sepedi, Setswana and other African languages do not have writing tools on the interactive whiteboard. Not all 11 official languages are taken care of by the digital technology initiatives*'. It may be argued that there is a need in South Africa to prepare teachers to integrate technology into their teaching for decades (Wachira & Keengwe, 2010). It is crucial for teacher to be equipped and supported in order to successfully integrate technology in teaching and learning

In Question 4 teachers asked about the challenges they encountered in the use of digital technology for teaching and learning. Most of the participants revealed that the major challenge is the limited access to resources. Concerning this, Teacher Mphahlele revealed that '*Facilities supplied are limited, only three classes access digital technology yet we have 30 classes*'. Participants also indicated that in most schools only grade 12 classrooms are equipped with digital technology. In most cases, these school are no school fees paying, therefore they rely heavily on the government of the DoBE. Teacher Nkomonde said '*The process of rolling out digital technology is gradually. Only grade 12 classes accesses these resources. We are not yet there*'. Teacher Leko indicated that '*We are a no fee paying school, we rely on DoBE to roll out digital technology. It has been more than two years waiting for them to roll out these technologies for grade 11 classes. Only grade 12 classes have digital technology*'. Teacher Khumalo also revealed that '*The government is not taking responsibility to equitably roll out digital technology to schools, hence our lack of resources. We also do not have adequate digital infrastructure*'. This was supported by Teacher Ngobeni who uttered '*The roll out of digital technology is the MEC's initiative, however it is too slow*'. Teacher Modipe said '*The government has a long way to go; only grade 12 classes have DT access*'. It may be observed fro these findings that most of the schools have a challenge of limited access to resources as only grade 12 classes have digital technology. Also it is clear from the findings that the schools rely on the government and the DoBE to support them with necessary equipment to integrate technology in their teaching practices. Research shows that schools are underfunded and inadequate trained teachers in the used of digital technology Smith, (2015).

In Question 6, teachers were asked to provide recommendations for effective DTTPDP as well as for their digital technology skills to be improved. In this case, the participants mentioned effective and continuous professional development. About this, Teacher Nkuna, indicated that '*More training and follow up still required, there are a lot of things we still cannot access*'. This was supported by Teacher Mgambi who said '*All teachers should receive teacher professional development since digital technology is here to stay; teacher professional development that was offered was not enough'*. Teacher Nyala said '*I believe monitored after school DTTPDPs at an equipped venue (maybe twice in a term); should improve our skills'*. Other participants revealed that more time should be given for training and practical use these technology during those sessions. In this regard, Teacher Clare uttered

'*More time is required. They must not train too many teachers at once in a single session. We need to be hands-on with digital technology for teacher professional development to be effective'*. Some of the participants felt that digital technology should be integrated in the curriculum. In this case, Teacher Molemo uttered '*Digital technology should be introduced in the curriculum. The two are currently divorced; they should be linked. They must also train us at school but not during school hours*'. It is clear from the findings that teachers recommend more professional development in order for them to be able to use and integrate digital technology in their teaching practices. This is supported in literature where Shepherd and Mullane, (2010) stated that teachers are failing to integrate technology into their classrooms in meaningful and appropriate ways. These authors stressed that the ability to select and use appropriate digital technology for classroom activities is an essential skill for 21st century teachers. Moreover, Moeller and Reitzes (2011) also noted that often, technology is not aligned with a school and district's vision, mission and curriculum. As a result, there is no foundation in place to provide consistent access to and use of technology throughout the school years.

QUANTITATIVE RESULTS AND DISCUSSION

Teachers were asked to verify whether they received DTTPD. Table 1 indicates that 76 (86%) out of 91 teachers accessed DTTPDPs and 12 (14%) did not. The responses in above are in line with views echoed in Fayad, (2012) who maintains that teachers need ongoing opportunities to attain and refine the highly specialised skills needed to teach in innovative ways demanded by technology and a competency-based curriculum

Table 1: Percentage and frequency distribution of teachers' access to DTTPDP

Code	Response item	Frequency	Percent
1	YES	76	86%
2	No	12	14%
	Total	88	100%

Teachers were asked to identify the service provider that offered the DTTPDP that they attended. Figure 2 below shows their responses. The results indicated in Figure 2 that 63 (73%) of the 91 teachers had received DTTPDP offered by DoBE, 22 (26%) from NGOs, and 1 (1%) from Higher Education Institutions. These results are supported by Wachira and Keengwe (2010) who reveal that federal agencies, national professional organizations, and teacher education agencies have embarked the need to prepare teachers to integrate technology into their teaching for decades.

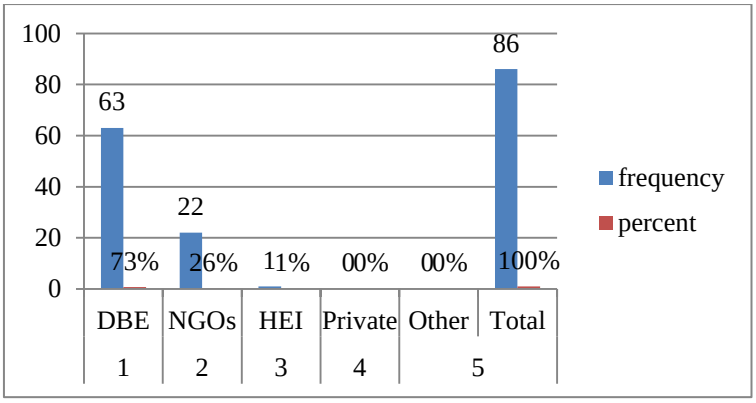

Figure 2: Percentage and frequency distribution of DTTPDP facilitation

Teachers were asked to indicate the duration of the DTTPDP that they were offered. Figure 3 illustrates that 12 (19%) had DTTPDP for 1 week to 1 month, 15 (24%) for up to a year, 6 (10%) for 2 to 4 years, and 6 (10%) for other periods. These responses indicate that there is still a lack of adequate DTTPDPs facilitation. To be systemic, DTTPDPs should provide teachers with ways to apply new learning directly to their teaching and support teachers. One-workshops with little direct connection to the teaching and learning or follow-up have minimal impact on teachers (Jaquith & McLaughlin, 2010).

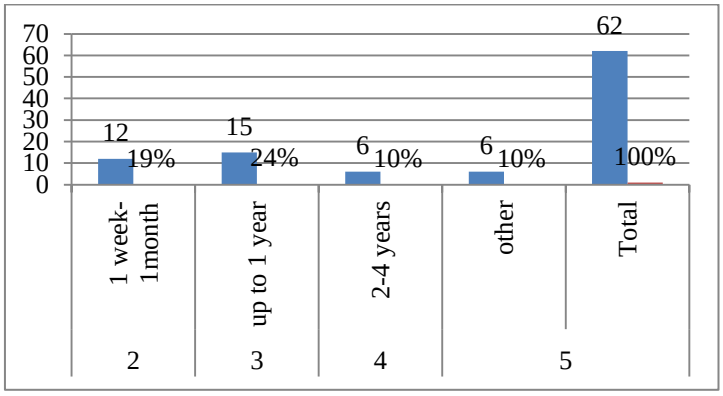

Figure 3: Percentage and frequency distribution of duration of DTTPDPs facilitation

Teachers were requested to indicate whether they received pedagogical DTTPDs. Although Figure 4 shows that most teachers 51 (65%) out of 91 indicated that they had received pedagogical DTTPDPs facilitation. There is still a significant lack in pedagogical DTTPDPs facilitation since 27 (35%) did not. Kleickmann et al, (2012) argue that teaching itself is a highly complex activity (cognitive skill) which requires many types of knowledge bases. They further maintain that these knowledge bases include content knowledge (conceptual and theoretical frameworks of the subject matter to be taught) and pedagogical knowledge (understanding of instructional practices, learning and assessment strategies, learner characteristics and classroom management).

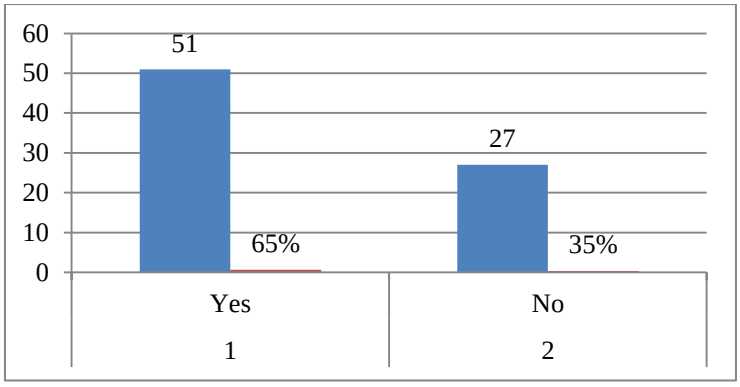

Figure 4: Percentage and frequency distribution of pedagogical DTTPDPs facilitation

Teachers were requested to indicate whether they would like to receive more pedagogical DTTPDPs in relation to the subjects that they teach. Figure 5 shows that 75 (89%) of 91 teachers would like to receive more pedagogical DTTPDPs in relation to the subjects that they teach, and 9 (11%) did not opt to get more DTTPDPs. Lemke, et al. (2009) argued that digital technology on its own is not likely to bring about improvements in schools, but could be a powerful tool for teachers and learners if it is integrated comprehensively and systemically to transform education. Research also shows that by merely introducing technology to the classroom without proper understanding of the underlying theoretical frameworks is not productive (Koehler & Mishra, 2009; Angeli & Valandies, 2013).

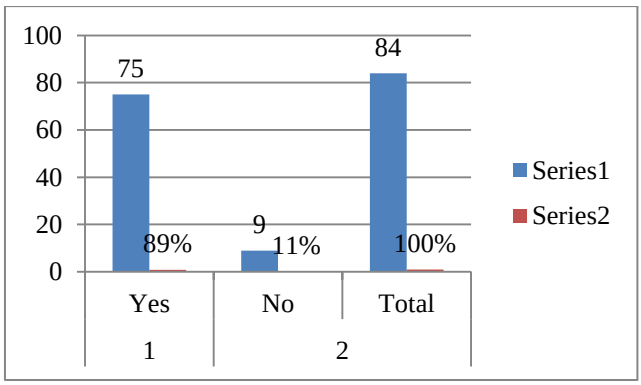

Figure 5: Percentage and frequency distribution of teachers pedagogical DTTPDPs facilitation

LIMITATIONS

This case study is only bounded on eight public secondary schools at the Atteridgeville in Tshwane South District 4 in Gauteng Province of the Republic of South Africa. The findings of this study cannot be generalised to any other public secondary schools in the district. Yet, it could be used in another context.

CONCLUSION

It may be concluded from this study that teachers have received some kind of teacher professional development, however this still needs to be improved for it to be effective for teaching and learning and for digital technology skills that are expected to be realised. It is

evident that despite having had several DTTPD initiatives in the district, there still is lack of adequate DTTPD received by teachers. It may be concluded that the no fee paying schools in South Africa seems to be battling when it comes to the adoption of digital technology.

RECOMMENDATIONS

This study recommended that the DoBE should develop and implement effective DTTPDP strategies to urgently address current lack of time for meaningful and effective DTTPDs. If the DoBE wish to see success in the effective usage of digital technologies in no fee paying schools, they need to fast track the installation, provide access to necessary resource and ensure the continuous professional development of the teachers. It is important that teachers are empowered on how digital technology can be integrated in the curriculum. The teacher need to be trained on how to develop a technology-enhanced lesson plan, that will indicate exactly the technology-enhanced teaching strategies to be used for a particular lesson, the relevant technologies, learning activities and assessments. This will assist teachers to achieve the outcomes of the lesson. By so doing the focus will not be on the digital technology but on the teaching and learning. It is therefore imperative for the researchers to recommend further in-depth research at a wider scale, to investigate the status DTTPDPs.

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FACTORS HINDERING THE EFFECTIVENESS OF TECHNOLOGY ON STUDENTS' MATHEMATICS ACHIEVEMENT AT VAAL UNIVERSITY OF TECHNOLOGY

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Abstract
The study of mathematics has been passed on from one generation to the next, and today it is considered as one of the most important school subjects. It is generally assumed that with the advent of modern technological devices, such as calculators and computers, the study of mathematics will be much easier now than it used to be in the past. However, students' performance in the subject seems to suggest the contrary. Most students generally perform badly in mathematics despite the advent of modern technologies which are supposed to make the learning of the subject much easier. This paper sought to investigate the factors that hinder the effective use of technology to enhance students' achievement in mathematics. In order to obtain data for the study, semi-structured interviews were conducted with 60 students and 5 mathematics lecturers at Vaal University of Technology in the Gauteng Province of South Africa. The study found that students entering higher education institutions lack the understanding of basic mathematical concepts and usually lean on technology rather than learning. It was also found that students do not have good study skills on how to use technology for educational purposes. The study also found that the method of assessment remains the same despite changes in teaching and learning as a result of the advent of technology.

Key terms: technology, internet, scientific calculators, mathematical concepts, performance in mathematics, study skills.

Introduction and background

The fact that the advent of modern technologies have made some aspects of life easier cannot be denied. The advent of cell phones and access to the Internet make it possible to obtain some information easily and faster. Students are therefore able to obtain important information on different topics of their courses. This makes learning much easier and convenient since information on content could be obtained anytime anywhere. Various researchers affirm that technology increases students' motivation and improves learning ((Fies, 2007, Warschauer, 2007, Galbraith, 2006). Fies (2007) reports that the use of technology increases students' motivation and engagement, improves mathematical reasoning; access to a variety of activities and use of multiple representations. Students usually get excited when technology is used in the classroom. They pay much attention to such presentations and this helps in their aesthetic memory.

The access to and use of technology in schools is growing worldwide. Technology is gaining ground at all levels of mathematics teaching and learning in schools. While it can be argued that with the advent of modern technological devices, such as calculators, smart phones and computers, the study of mathematics has become much easier, some students' performance in the subject seems to suggest the contrary. Students can use devices like calculators, standard software programmes, and the internet, to enhance learning in a number of ways. They can perform tedious calculations more quickly and organize data into tables and graphs efficiently, and present findings more clearly (Willard, 2005). With smart phones students can take photos of notes or worked examples. That is, they now can have access to study materials at any time. They are also able to view presentations of mathematics topics from YouTube. These presentations can be viewed at many times at the students' convenience. While the authors acknowledge the importance of technology in mathematics learning, they also argue that the mere presence of technology is not enough to improve students' performance. Teachers need to have the pedagogical knowledge and a good understanding of the appropriate technology to be used in teaching a particular mathematical concept. Leu (2000) affirms that teachers' willingness, comfort and ability to utilize and integrate technology into mathematics classrooms is the key to providing robust classroom experience.

Gimbert and Cristol (2004) concur that the use of computers and related technologies has often been linked with increase student achievement. However, most students perform badly in mathematics despite the availability of modern technologies in education (McCarthy & Oliphant, 2013). The need to understand this contradiction motivated the choice of the topic for this investigation. This paper therefore aims at identifying and discussing some of the factors that hinder the effectiveness of technology in improving students' performance in learning mathematics.

Theoretical framework

This paper is based on the constructivist theory of learning. The constructivist learning theory is usually associated with Vygotsky's (1978) work. This theory posits that learning is an active process which means that the learner has to do something because learning is not the passive acceptance of knowledge which exists somewhere. Learning therefore demands that the learner has to engage with his/her world. Constructivist learning theory also acknowledges the importance of prior knowledge in learning, since new knowledge is usually built on the previous knowledge and experiences of the learner. This implies that one needs knowledge in order to learn and the more we know, the more we can learn.

The implication of this theory for education is that teachers need to encourage mathematics students to take active part in teaching and learning. For an example answering and asking questions during class. They should also guide students on how to use appropriate technologies in learning. In the constructivist theory of learning the student is considered as an integral part of the learning process. With the integration of technology into teaching and learning, students are supposed to be actively engaged rather than being passive recipients of knowledge. For example the use of scientific calculators in class may allow students to

perform complex computations and not to rely on the teacher for the final answer. Participation in learning activities assists students to own what they learn, because they learn by doing.

As the constructivist theory postulates, children develop their thinking abilities by interacting with other children, adults and more importantly the physical world (Cakir, 2008). Consequently, by engaging with technology, students are likely to improve their knowledge on some of the basic concepts in mathematics. The use of mathematics software such as maple, mathematica for example could help students improve their skills in plotting and interpreting graphs.

Literature Review

Most of the studies on the use of technology in teaching and learning mathematics have alluded to the fact that technology increases students' motivation and improves their learning. Gadanidis and Gieger (2010), Pierce and Stacey (2010), Nelson, Christopher and Mims (2009) found that strategic use of technological tools can support both the learning of mathematical procedures and skills. In an interview conducted by Ruthven and Hennessy (2002) with mathematics teachers in seven schools, it was found that regular access to technology and familiarity with software and hardware made students' success more likely. Galbraith (2006) conducted a study on mathematical outcomes resulting from the use of technology and how technology contributed to these outcomes. Galbraith claimed that the use of technology has the potential to bring about broad changes in students. This includes communication and collaboration among students, facilitating the ability to conjecture, justify and generalize findings. However, Muir (2007) observes that how technology is used is an integral component in determining its impact on students' learning. Galbraith (2006), on the other hand alludes to the problems of technology integration, both in terms of software intricacies and student behaviour. Students usually develop the tendency of trusting technology over their own knowledge or capabilities and sometimes do not consider the context of the problem. Rather than applying their minds to see whether the answer they have obtained from the calculator makes sense, students just write down whatever they get. In statistics for instance where the context is the "number of people", you will find a student writing an answer like *12,8 people*, just because the calculator gave that answer during the calculation. In this situation the student is expected to realize that there is no fraction for people. This affirms the assertion that if mathematical understanding is absent, the student is reduced to blind consumption of whatever output is generated, irrespective of its accuracy or worth (Galbraith, 2006).

Students' previous experience is a major factor that relates to their familiarity with the use of technology. Naturally students who are more experienced in the use technology have more positive attitudes towards the application of technology to learning and perform better than their counter peers in technology related tasks (Kay, 2006; Mercier, Barron & O'connor, 2008).

With the advent of computers many teachers have changed their approach to teaching. Computers can now be used to offer lessons to students by showing them videos on different topics in mathematics. This approach has the potential to arouse students' interest in mathematics lessons. Warschauer (2007) affirms that the use of technology in the classroom in the form of videos increases students' excitement and accelerates learning. Despite the numerous advantages of technology in teaching, there are some research findings on how teachers perceive technology use in the classroom. For instance, Cope and Ward (2002) assert that experienced teachers who have little or no professional development in the use of technology in the classroom are less likely to use it in the classroom and are less likely to see the benefits.

Even though it is generally perceived that technology has the potential to improve students' academic performance, some researchers have found that it may have very little or no impact on students' performance in mathematics. Citing Russel (1999), Sarfo and Ansong-Gyimah (2010) report on some empirical studies that found that technology (eg computer) does not directly improve learning. Salmon (2002), adds that despite the infusion of information technologies with the Internet, most classrooms today are not different from those of the past in terms of learning. Again in a study by Sarfo and Elen (2007) to test the effects of learning environments with and without technology indicated no significant difference in terms of the learning gained. Furthermore, in a study of the effectiveness of reading and mathematics with and without technology on standardized test scores, Dynarski, Campuzano, Agodini and Rall (2007) found no significant improvement in scores between treatment and control classrooms in either subject. According to Glennan and Melmed (1996) assessments of the impact of technology are really assessments of the instructional processes that are supported by technology. The effectiveness of the technology used is therefore directly tied to the effectiveness of the instructional design, content and teaching strategies employed by the teacher. Students' performance in mathematics examinations remain poor and do not suggest that the technologies are helping (Tachie and Chireshe 2013). This paper therefore aims at identifying and discussing some of the factors that may hinder the effectiveness of technology use in improving students' performance in mathematics.

Methodology

The study was set up to identify factors that may hinder the effectiveness of technology on students' mathematics achievement. In order to obtain data for the study, semi-structured interviews with a purposively selected sample of five mathematics lecturers and sixty students from the mathematics department at Vaal University of Technology in the Gauteng Province were conducted. The students were selected from three different levels; 1, 2 and 3 (20 participants from each level). The small number of participants was not a concern since most of the responses were similar. The interviews sought to identify some of the factors that might hinder the effectiveness of technology in teaching and learning mathematics.
The interview items therefore focused on the following:

Level at which mathematics is taught, kind of technology used in teaching and learning, how such technologies improve teaching and learning value of such technology and what are the hindrances to the use of technology.

Results and discussion

All the participants, both lecturers and students, mentioned the use of one or more of the following technologies: scientific calculators, computers, and smart phones. Apparently these are the common technological devices often used by most students in studying mathematics. The following softwares are also used either in teaching or learning mathematics: mathematica, maple, excel and matlab.

All the five lecturers agreed that the use of these technologies has helped them in preparing their lessons and improved their teaching of mathematics. They added that rather than finding information from textbooks, one can now access information anytime anywhere from the Internet. The lecturers also mentioned that scientific calculators help students to do complex calculations faster. According them it saves time and therefore more work can be done within a short space of time. With the use of computers, the lecturers believe that more information on mathematics topics could be accessed from the Internet much quicker than to obtain them from books in the library. The lecturer participants agreed that videos on presentation of some mathematics topics could also be accessed from YouTube. Whereas all the lecturers agreed that the use of technology has improved teaching, they could not say whether that has translated into students' understanding or improved their performance the subject.

Three of the lecturers indicated that they use software, such as mathematica, to prepare their lessons. They agreed that using technology saves time and enhances students' concentration, especially when videos of lessons are shown to them. However, upon further interrogation, it emerged that none of these lecturers has actually conducted mathematics lessons using videos. Thus as much as they see videos as a good teaching tool they are yet to encourage students to watch videos of various mathematics topics from YouTube.

All the 60 students who were involved in the interviews indicated that at least one of the following devices is used in learning mathematics: computers, scientific calculators and smart phones. Thirty-five (N=35) i.e 58% of the student participants mentioned that these devices help them to access information from the Internet to complete assignments or projects. Most of the students (80%) concur that these technological devices help them to access information on some topics, for example listening to videos from YouTube. They also mentioned the sharing of information among themselves on WhatsApp. Thirty students (50%) indicated that with these technologies, one does not necessarily have to be in class every day. These students also agreed that there are some factors that may hinder the effectiveness of technology. These include connectivity and lack of money to buy enough data to access information. During the interview it emerged that students who own smart phones or iPad can get connectivity to the Internet with the availability of Wi-Fi facility. Those students who do not have smart phones or iPad can always access information from the University library.

When the lecturers were asked if the use of technology has improved students' performance in mathematics, three of them said it is difficult to say if the use of technology in class has improved students' performance. Two of them however were of the opinion that those students who use technology effectively and further consult with their lecturers, do well in tests and examinations. One of the lecturers has this to say:

I know two students who usually come to me when they find different method of solving a particular problem. These students are always accessing information from the Internet and they do very well in tests.

The other lecturers could not say whether the use of technology in class has really improved their students' performance.

When students were asked whether the use of technology has helped to improve their performance in mathematics, the following responses were captured from five (5) of them.

- *I seem to understand some of the things in class but in tests/exams I get low marks*
- *I think the use of technology has helped me to improve my performance, I get extra information from Internet and they helped a lot.*
- *I do understand the lessons on videos via YouTube but the tests seem to be different and sometimes tricky.*
- *I think some lectures make the tests/exams more difficult so it is not easy to pass.*
- *You can understand some of the topics, but during examination time you forget.*

The responses above indicate the mix feelings of technology in teaching and learning. While all the participants agree that technology has potentiality in enhancing learning, there were others who acknowledge its weakness too. The responses indicate factors that may hinder the effectiveness of technology in students' performance in mathematics. These may include lack of basic mathematical concepts, poor study skills, Internet connectivity, technology not used for educational purposes and mode of assessment.

Poor study skills

The study found that forty five (75%) of the students lack study skills. For example instead of learning the details of each topic and how various topics relate to each other, students mainly concentrate on worked examples. Under such a situation one finds that when a question is given in a different context, they are found wanting. This situation may have its roots from how students study at school. At school level, most students rely mainly on past questions instead of learning to understand the content. This situation may contribute to students not able to interpret the solutions they obtain when they solve mathematical problems. The following response from one student affirms it all:

I seem to understand some of the things in class, but in tests/exams I get low marks.

Lack of basic mathematical concepts

The consequence of not understanding a particular topic as a result of poor study skills result in lack of basic mathematical concepts. Since students focus on just passing, they neglect the basic concepts that are related to particular mathematical topics. During the interview one student mentioned that one forgets what one knows during examination session. Here, it is not a matter of mere forgetting but rather lack of proper understanding of concepts. In this case no matter what type of technologies are used the benefits will be minimal. Technology does not directly improve learning (Russel, 1999) unless students make effort to use it to support their learning.

In order to realize the benefits of using technology in a mathematics classroom, students need to be familiar with the basic concepts of mathematics. Like many developing countries, many South African students struggle with mathematics at tertiary level. This could be attributed to lack of understanding of some basic concepts from the school level. Analytical skills in mathematics is usually built upon from early school years. This implies that mathematical knowledge is hierarchical in nature and therefore a strong prior knowledge is critical for conceptual development. Reddy, Van der Berg, Janse van Rensburg and Taylor (2011) argue that there is a strong relationship between grade 8 and grade 12 mathematics scores. This finding corroborates the assertion that strong foundational knowledge in mathematics forms the base for subsequent learning. Learning with understanding is therefore necessary at school level, rather than students leaning on technology.

Technology not used for educational purposes (socialization)

All the 60 students who were interviewed (100%) mentioned that they use their technologies more often on social matters rather than on academic. Facebook and chatting are among the frequent use of technology by most students. Very often students prefer to watch videos which are not related to their studies. From the discussion with students it became clear that some even go to the extent of engaging themselves in technological games when their lecturers are teaching. It therefore seems like these technologies are being used mostly for entertainment rather than for education purposes. This confirms what Muir (2007) observed, that the way and manner technology is used is an integral component in determining its impact on students' learning.

Traditional method of assessment

The evolution of modern technologies has brought about reforms in teaching and learning. However, the method of assessment has not changed much to reflect the current changes. Examinations and tests which are normally written at the end of the semester, still remain the major determinant of learning in most institutions. This method of assessment may not be adequate to measure one's ability in a subject which has been studied over 13 weeks or more. These examinations may not take into consideration some challenges such as sickness or stress and inadequate memory retention.

Tests might be designed and conducted by the lecturer to suit his or her dispositions. Lecturers, in most cases determine the objectives and the conditions under which tests are written. It was therefore not surprising when one student mentioned that:

I think some lecturers make the tests/exams more difficult so it is not easy to pass.

Despite the fact that technology is not widely used in most mathematics classrooms, students have access to information on various topics which can complement what they learn in class. Accessing information from the Internet can now be done with cell phones (smart phones). Higher education institutions in South Africa, including Vaal University of Technology, have connectivity to the Internet using Wi-Fi. This means students with smart phones or iPad, can easily access information from the Internet anytime anywhere on campus to supplement lectures.

Conclusion

The study aimed at identifying some of the factors that might hinder the effectiveness of technology in improving students' achievement in mathematics. The study found that the factors hindering the effective use of technology in mathematics learning include lack of understanding of basic mathematical concepts, lack of study skills, technology not used for educational purposes, not understanding word problems, lack of Internet connectivity and lack of pedagogical knowledge and its application by lecturers. The study therefore concludes that for technology to be effective, mathematics teachers should select appropriate devices and assist students to use them for learning in mathematics lessons.

Recommendations

Based on the findings, the study recommends that:

- The teaching of mathematics at the foundation and intermediate phases be strengthened so that when students enter the Further Education and Training (FET) phase they have clear understanding of the basic concepts. This may require teachers with good content knowledge and effective pedagogical strategies.
- At the school level the teachers' instructional strategies should also encourage students to develop their study skills, which is why the department of education should hire specialist teachers to teach the subject right from the foundation phase.
- Higher education institutions should train lecturers in the use of technology to teach.
- It is further recommended that the method of assessing students should reflect the way technology is used in learning.

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E-TUTORING AND NOMADIC EDUCATION IN NIGERIA: MYTHS AND REALITIES

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Abstract
The advancement of technology is increasing significantly. In other words, the world is increasingly digitalized; and it covers the broad spectrum of human life. Education institution is not immured from this rapid global changes ushered in by the technological development. In fact, existing scholarship has clearly showed that the use of technology tremendously enhanced instruction and learning outcomes. However, while most technologically advanced countries have extended the gains of the global technological progress in teaching and other activities in the school, less technologically advanced countries are still lagging behind in the utilization of the gains of technology as a means of instruction. It is against this backdrop that this paper examines the plausibility of the application of technology in the least technologically advanced nation like Nigeria. In doing this, this paper reviewed literature and some secondary data on E-tutoring and nomadic education across contexts. Based on this review, the paper concluded and suggested that E-tutoring could be adopted for teaching the nomads in Nigeria as part of the government's commitment to achieve the goal of education for all.

Keywords: E-tutoring; Education for All; Nomadic Education; Pastoralists.

Introduction

The importance of education in modern societies cannot be over-emphasized. It is universally acknowledged that principles of human development can only be achieved through sound education. With quality education, a child can be empowered economically and socially to fully contribute to the growth, strength and stability of the society. The adoption of education as a fundamental human right globally has made its provision a duty of every government which must be given to the citizen irrespective of gender or social class. With the endorsement of the Education for All goals at the World Education Forum in Dakar, Senegal in the year 2000, education has been given a top priority by governments of the various countries across the globe to ensure that no one is left behind. The Nigerian government in its commitment to achieve the goal of education for all also put in place policies and reforms to ensure that citizens have access to quality education without discrimination as to gender, political or ethnic consideration.

As noted by Amadi (2015:16), absence of quality education and disparity in access to education are more likely to fuel conflicts between/among different groups in society. The author linked the current insurgency in the Niger Delta region of Nigeria to the failure of education system in Nigeria. In addition, the author argued that many years of neglect of the region has compounded the problem of access to education in the region. Also, the recurrent insurgency in the northern part of Nigeria has been linked to poor quality of education and access to schools by the children in this region. Due to the significance of quality education in ensuring stable, orderly and peaceful society, the 1979 Constitution of the Federal Republic of Nigeria states that every Nigerian child has inalienable right to quality education and the government should ensure fair learning opportunities for its citizens regardless of their creeds, ethnic grouping, gender and socio-economic status. Based on this legislation, it is the duty or responsibility of the Nigerian government to provide quality education to the nomads[1].

However, like in other countries, the educational system in terms of enrolment, participation and outcomes have largely failed the nomadic communities (Abbo, 2011). And as declared by a former federal minister of education, Professor Jubril Aminu (cited in Amadi, 2015:16), "...wandering clans of Nigerian cattle rearers are as much a part of Nigeria as any major tribe. Consequently, it is only right that they also partake of the same rights and privileges as the rest of us". The cheering news of the establishment of Almajiri schools in the northern states of Nigeria and the attendant success thereof make the promotion of communication with the group a national imperative. This is because the rampant clashes between nomads and their host communities have been traced to poor communication as many of the herdsmen could barely communicate in English language. As Nigeria has over two hundred tribes and languages, the itinerant nomads find it difficult to communicate with the other ethnic groups; thus encouraging literacy and numeracy among them will help them to read, write and access the internet to know how to promote the sale of their products and how to prevent animal diseases.

As a matter of emphasis, the challenging question is: how can the goal of education for all be extended to the nomads considering their itinerant lifestyle? Various scholars have commented on how this challenge could be surmounted within the context of nomadic education in Nigeria (Djebbari, 2012; Adeyemo, Adu & Adelabu, 2015). They viewed that the world is now a 'global village' with the advancement in communication technology and increasing rate of digitalization. This technological advancement, particularly in the area of information and communication covers the broad spectrum of human life of which the education institution is not immured from. With every country trying to belong to the 'digital age', global technological advancement has influenced teaching and other activities in the school. The modern classroom has changed in terms of the teaching methods, technology,

[1] The nomads are sedentary group of people with a peripatetic lifestyle. In Nigeria, they are found across the nation and include the cattle rearers, the fishermen, the farming nomads and traders.

instructional materials, students' assessment, learning outcomes and so on; thereby making teaching more student-centered and less teacher-centered (Djebbari, 2012). Also, the process of teaching and learning has been transformed in the technologically advanced countries with the use of information, communication and technology (ICT), learning opportunities and support have been delivered electronically through computer network and web-based technology (Adeyemo, Adu & Adelabu, 2015).

However, Djebbari (2012) noted that in the less technologically advanced countries, like Nigeria, the goal of digitalizing classrooms for learning is somehow difficult to achieve. Moreover, the objective of establishing mobile schools to cater for the education needs of the nomads in the northern Nigeria may be difficult to realize considering the level of technological development in the country. The implication of this is the continuous lagging in the utilization of the gains of technology as means of instructions, particularly to itinerant tribes, like nomads in the northern region of Nigeria. Therefore, bringing in technology into the educational system will require its proper integration into the curriculum with appropriate mechanism and support put in place by the government.

Essentially, there has been a strong advocacy for nomadic and pastoral education in countries with high number of pastorals and other nomadic groups. In other words, various studies had been carried out on nomadic education (Umar & Tahir, 2000; Dyer, 2000; Mfum-Mensah, 2003; Olateju, 2010). However, three observations were made in the available literature: (1) the nomads are educationally marginalized; (2) education of the nomads is vital to their development, involvement and contribution to their societies; (3) there is more recent international interest in promoting education among these groups. Another argument was that the minimal participation of the nomads in school is directly connected to the promotion of the values and practices of the dominant culture by the school without accommodating the needs of the marginalized populations (Mfum-Mensah, 2003). Other discussions had been on the poor suitability of formal education, fixed-place schools, issues with residential schooling, some experience of mobile provision of education, and a stress on alternative modalities, including distance education- to keep with the Dakar emphasis on flexibility (Dyer, 2016). Thus, the aim of this paper is to examine how the goal of education for all could be extended to the nomads in the northern region of Nigeria through the use of modern technology. In achieving this aim, literature was reviewed and the experiences of other contexts where such provisions have been made for the itinerant tribes or groups were critically reviewed. The essence of this review is to learn best practices or draw lessons from other contexts that had or still experimenting technologically enhanced learning for the nomads.

Nomadic Education across Contexts

The nomadic communities are the survivors of the purge of capitalist social reforms, with strong group cohesiveness, distinctiveness and unity (Umar & Tahir, 2000). Nomads are found in all parts of the world like the Aborigines of Australia, the Massai, the Gypsies and Tinkers in Britain (Amadi, 2015). In Africa, they run into millions of people constituting

about 6% of the population and are found in at least 20 different countries across the continent (UNESCO, 2016). They are also found in the Middle East and southwest and central Asia (Olateju, 2010). They live on both land and water and include the peripatetic, hunter-gatherers, sea nomads, fisher folk and mobile pastoralists (Dyer, 2016). In Nigeria, they constitute a major socio-economic group supplying about 95 percent of the nation's protein needs being the major supplier of beef, mutton, hide and skins, hoof, horn, dung for manure, bones, cow urine for producing medicine etc. (Amadi, 2015). Traditionally, the children get educated in matters relating to their way of life by watching and emulating the adults as they carry out various daily activities. The children are also taught Quranic recitation and instructions by a designated teacher who always moves with them in their pastoral life (Olateju, 2010).

In Mongolia, a major nomadic population, a compulsory state-sponsored education initiative was introduced for children between 8 and 18 years with the establishment of hundreds of schools with dormitory facilities in the rural settlement. Free education with well-staffed schools and adequately paid and motivated teachers were put in place, all of which resulted into more than 90% literacy achievement within 20 years in the country (Olateju, 2010; Dyer, 2016). However, this initiative was only successful during the socialist regime; it declined in both quality and availability with changes in the post-1990 market economy (Dyer, 2016). Another delivery adaptation, radio-based distance learning, a form of Open and Distance Learning (ODL) was established for the highly mobile learner due to the flexibility of its mode of delivery which solves the problem of learning barriers of time, place, pace and methods of study. Although this solves the issue of access, identifying and meeting the learning needs of the learner in a large-scale programme remained disputed (Dyer, 2016).

In Somalia, the pastoralist population is about 65% with four main livelihood zones; camel, cattle, goat and sheep. Though parents gave reasons for not sending their children to school as non-availability of schools, lack of money, constant migration and lack of perceived benefits of sending children to school (Carr-Hill, 2015). However, the challenges of educating the nomads include: (1) difficulty of providing them with classes or clinics, or helping them benefit from social services and (2) the educational system's urban orientation and the educational facilities built in the towns or major villages were meant to serve only settled communities (Olateju, 2010).

In Ghana, a non-formal basic education program, the Shepherd School Program was established in 1996 to promote educational development and address the issue of marginal school participation. The program was viewed as being appropriate, cost effective and accessible to disadvantaged children, harmonizing their needs and socio-cultural responsibilities. The educational responsibilities of parents, the curriculum, daily school organization and grading of classes were similar to that of formal education. But, the flexibility of school schedules and time, recruitment of facilitators to facilitate (instead of teaching) the program, supervision and management, and the use of a local language as means of communication made the program non-formal (Mfum-Mensah, 2003).

In Iran, white tent schools, a form of mobile schools were introduced in 1924 as a delivery adaptation of providing schools for the mobile learners. Thus, the children were able to combine formal and livelihood-orientated learning. Nonetheless, the programme was an acceptable integration, rather than assimilation of nomadic groups into formal education (Dyer, 2016). Similarly, in Sudan, in the mid-1990s, UNICEF sponsored 200 mobile schools in Sudan while Oxfam also used this same model in Sudan and Mali. Though promising, the mobile schools were not the perfect option for some of the following reasons: (1) difficulty of recruiting teachers; (2) learners tend to be temporary despite the mobility of the schools; (3) demands of the welfare of the animals which may require their immediate attention (and this usually take precedence among the pastorals); and (4) there is likelihood of having an unstable enrolment progression and the challenge of overseeing the quality of mobile education (Dyer, 2016).

However, in country like Eritrea, the nomadic communities had a sense of fulfillment with the educational system established. A non-formal Complementary Elementary Education was established to suit their migration pattern and education committees consisting of community elders, mothers and fathers were also set up (Olateju, 2010).

Fundamentally, in Nigeria, with the strategic position occupied by the nomads in the country's economy, their education should therefore be given high importance for them to be well acquainted with the global and competitive economy. With quality education, their lifestyle and social interaction will also be improved and this can be achieved by teaching and educating them through modern technology (Olateju, 2010; Dyer, 2016). Based on this position, the next section addresses the prospects and challenges of nomadic education in Nigeria.

Nomadic Education in Nigeria: Prospect and Challenges

The nomadic people in Nigeria are mostly pastoralists while others are migrant fisher folk and farmers forming a major socio-economic group (Olateju, 2010). With an estimated population of 9.4 million of which about 3.1 million are children of school age, the group is said to have limitations to equitable access to basic education with the literacy rate ranging from 0.2% to 2.0% (Abbo, 2011; Tahir, Muhammad & Mohammed, 2005). In terms of enrolment, participation and outcomes, just like other countries, the national education systems have generally failed the nomadic communities (Abbo, 2011) and the political commitment of ensuring their right to education has been inconsistent (Dyer, 2016). Olateju (2010) identified some major constraints for the pastoralist nomads' participation in formal education as; their continuous migration; the involvement of the child in their occupationally driven lifestyle; their ignorance of the usefulness of formal education; and non-provision of a functional/relevant curriculum for them. Other forms of constraints as observed by Said (n.d.) included:

- Cultural factor: The nomads believe that western education will generally make them loose their cultural identity. For example, among the nomadic Folbe family, hawking dairy products is part of womanhood thus; giving a girl child education will deny her of such responsibility and alienate her from her cultural identity.
- Religious Factor: The nomads are mainly Muslims and would not allow free mixing of opposite sexes. This will limit the access to education especially for the females except where there are female teachers. Also some are of the religious beliefs that it is an abomination for a girl to experience her first menstrual period at her father's house thus; she must be married early.
- Social Factor: The social life of the nomads does not encourage western education for the absence of role models to emulate as reference. The male simply wants to own herds of cattle and establish a family just like his father; while the female is basically for proliferation and to take care of the home.

In line with the educational objectives in the Nigeria's Constitution and the National Policy on Education that education should be made to reach all citizens as of right, ensuring that there are equal and adequate educational opportunities at all levels to eradicate illiteracy (Federal Republic of Nigeria, 2011), the government intensified its effort in providing quality basic education to the nomadic group in the country. Nomadic education as a sub-section of formal education was set up as a result of the commitment on the part of government to equalize educational opportunities amongst its citizens irrespective of their ethnic, gender, political, religious or social class. This special educational provision for the nomads is important since the conventional approaches could not fit well in their highly mobile pastoral way of life. Thus, the National Commission for Nomadic Education (NCNE) was established in 1989 (Umar & Tahir, 2000; Tahir, Muhammad & Mohammed, 2005; Abbo, 2011).

However, those involved in the development of educational policies have paid terribly little consideration to what forms and content of education that best support the mobile livelihoods of the nomads. With education as a right - a fundamental human right, the emphasis should be on education/ getting educated and not on schooling/ type of school. Thus supportive conditions that promote effective redistribution of resources and recognize the economic contribution of mobile populations, maintaining nomadic livelihoods should be part of a global development strategy that enables more people to meet their daily needs and minimizes environmental degradation. The provision of education should be reconfigured and made more flexible to achieve this goal.

E-tutoring: An Analysis

Various terms have been used in describing the use of technology and learning/teaching processes that occur over geographical distances. These include "distance", "online", "network-based", "web-based", "e-learning", and "e-tutoring" (Green, 2009). Electronic-tutoring or E-tutoring is an extended version of tutoring which uses the advantages of information technology and the internet. It is a relatively new phenomenon that came into existence with improvements in network bandwidth and advent of Web 2.0 technologies. E-tutoring is a modified support from a tutor to a single or a small group of tutees using the

internet as the medium of communication. The E-tutorials involve the use of Information and Communication Technologies (ICT) and are online, self-taught modules designed to teach people new skills using a step-by-step process. This form of academic support, according to technology advocates, is said to be more effective than the traditional classroom teaching due to its frequency of interaction, proximity of feedback and personalized instruction style (Corrigan, 2012).

The term ICT according to United Nations Educational, Scientific and Cultural Organization (UNESCO) indicates the tools and the processes used in accessing, retrieving, storing, organizing, manipulating, producing, presenting and exchanging information via electronic and other automated means. These include the hardware, software and telecommunications in the forms of personal computers, scanners, digital cameras, phones, faxes, modems, Compact Disc (CD) and Digital Versatile Disc (DVD) players and recorders, digitized video, radio and TV programmes, database programmes and multimedia programmes (Eze and Adu, 2013). According to Adu and Olatundun (2013), the use of ICTs in education have the potential of innovating, accelerating, enriching, and deepening skills, thereby motivating and engaging students in relating school experiences to work practices which assist in creating economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change. Some of the Web 2.0 features made available through E-tutoring include: Synchronous (real time) communication such as chat rooms; Asynchronous (time-delayed) communication such as discussion threads; VoIP (voice over internet protocol) such as Skype; Podcasts (the audio or video version of a blog); Interactive white boards, often with graphing and mathematical equation functions; and of course, e-mails.

E-Tutoring

Advantages	Disadvantages
• It is flexible-the schedule of tutoring and learning can occur at any convenient time for the student. • It is highly convenient- it saves time and expenses of travelling for both the tutor and the tutee. This sometimes makes it cheaper for everyone than the face-to-face tutoring. • The lesson could sometimes be recorded, accessed and saved for reference at a later more convenient time for the student. This gives room for future review/ analysis. • Parents have the advantage of	• It cannot substitute human interactions- sometimes the facial expression of the students help the teacher to identify students with learning difficulties during the lesson. • Some subjects cannot be easily taught online especially the technical ones that require more practical sessions. • A breakdown or technical faults with the computer or server may disrupt the class, constituting a great barrier • It may not be suitable for young children, especially kindergarten students who sometimes need to be consoled or encouraged when finding

monitoring the quality of what the children are taught and also the safety of the children since the lesson is taken from home. • Location/place is not a barrier for classes. It could be accessed from anywhere globally. Both the tutor and the students can follow the progress of the class from anywhere. • Students can swiftly and easily have access to the tutor for quick online session in case of any difficulty while having a personal study. For example, a quick online physics session can help in solving a difficult concept/question on one hand and save time on the other. • Availability of variety of online teaching aids assist the tutor to personalize teaching approaches to suit the need and learning style of the students. • Highly knowledgeable, qualified and experienced tutors could be gotten at an affordable price • It gives students some privacy- shy students have the opportunity of asking questions and expressing themselves within the comfort of their homes. • E–tutoring has the potential to reach learners of any age, anywhere in the world, sharing and growing knowledge without boundaries and thereby enhancing learning and educational opportunity. • Students are not bound by space or location in meeting their learning needs, they have the	learning a particular concept or subject difficult to understand. • Problem of internet connectivity may pose a serious challenge.

capacity of sourcing for knowledge and help from anywhere around the world.	

Sources: Olateju (2010); Green (2009)

E-tutoring and Nomadic Education in Nigeria

Globally, E-tutoring as a form of online academic support service is now being offered by public, private, and non-for-profit organisations as an alternative to the conventional method of tutoring in some countries (Corrigan, 2012). As a result of technological advancements and educational needs of the nomads, E-tutoring as a form of ODL can be adopted to help in bridging the gap between their mobile livelihood and formal education provision. As development in technology advances, especially with improved mobile telephone coverage, the delivery constrains in challenging physical conditions can be overcome through E-tutoring. However, there is need to format the programme content and delivery to meet the nomadic groups' needs in language, learning, and curricula.

Some of the policies/ strategies to put in place by the government, educational administrators and other stakeholders in nomadic education in adopting E-tutoring for the nomads should include educational policy and planning, infrastructure, language and content, capacity building, and financing. The objectives, guidelines, resources and target of the educational policy and planning should be clear and specific to the needs of the nomads. While acknowledging no singular formula for ICT integration in the educational system, Eze and Adu (2013:15) identified some essential elements of planning for ICT in education as:

- Analyzing the existing institutional practices and arrangements to identify the drivers and barriers to ICT use, especially the curriculum, teaching, infrastructure, capacity-building, language and content, and financing.
- Pilot testing any chosen ICT-based model
- Identifying the stakeholders and interest groups and harmonizing their efforts.
- Stipulating current sources of financing and the development of plans for generating financial resources to support ICT use over the long term.
- Specifying the educational goals of all education and training levels along with the different modalities of use of ICTs that can best suit pursuit of these goals.

Conclusion

Generally, education involves teachers and students engaging in mutual creation of beneficial knowledge and practice, and the broad objective of all nomadic education is to make the nomadic community appreciate the value of formal education and benefit from it. Offering the much needed and essential literacy assistance to the nomads will go a long way in

encouraging their peaceful cohabitation within the community and also contribute greatly to national development. Thus, the adoption of the use of modern technology (like E-tutoring) in the teaching and learning process of the nomads will assist in achieving this objective and also improve their socio-economic status and communication with the larger society.

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EXAMINING THE EFFECTIVENESS OF DELIVERY APPROACH OF ADULT NON-FORMAL EDUCATION AND TRAINING FOR EMPLOYMENT IN SOUTH AFRICA

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Abstract
The purpose of this paper is to examine the effectiveness of delivery approach of adult non-formal education and training (NFET) in fostering skills utilisation in the wage or self-employment of graduates in South Africa. The study used a mixture of quantitative and qualitative methods. The findings reveal that the training delivery approach was effective for the adult NFET programmes focusing on self-employment in micro-enterprises of the graduates. Individual graduates who participated in the private centres had a higher probability of becoming wage or self-employed. The author concludes that the training delivery approach was effective only for the centres that linked adult NFET programmes to income-generating activities in micro-enterprises or co-operatives. The findings imply that NFET programmes can be relevant tools to foster employment in South Africa.

Keywords: Adult education, non-formal education, skills acquisition, income generation, human capital theory, South Africa

Introduction

Non-formal education and training (NFET) became part of the international discourse on education policy in the late 1960s and the early 1970s. As an education system, NFET programmes have emerged with the aim to make educational opportunities available to larger groups of the disadvantaged population (Rogers, 2004). From its inception in the early 1970s, NFET distinguished itself from formal education system by being relevant to the needs of disadvantaged groups (Rogers, 2004; Georgiadou, Kekkeris & Kalantzis, 2009). With regard to the purpose, Georgiadou, et al. (2009) assert that NFET programmes are intended to be a tool to create opportunities for marginalised social groups in order to bridge unemployment and employment. In this connection, NFET programmes are perceived as a 'second chance education' to those who had been 'pushed out' from the formal system (Kedrayate, 2012, p.12). Therefore, in this paper, NFET refers to a skills programme carried out outside the framework of the established education system that involves foundational knowledge, technical and manual skills, entrepreneurial skills and competencies tailored to the specific requirements of gainful employment or self-employment (DVV International, 2011; Erasmus, 2010).

In developing countries, NFET programmes are used as strategies to reduce unemployment due to lack employable skills among poor adults. In other words, adult NFET focuses on clearly defined purpose which is to meet the need and objectives of the beneficiaries. The South African government legislated non-formal adult education and training through the Adult Education and Training (AET) Act 25 of 2010 in order to reduce poverty due to unemployment among non-educated and unskilled adults (RSA, 2010). In the context of South Africa, providing NFET to special target groups is meant to assist those adults who have no access to formal vocational training systems, such as Technical and Vocational Education and Training (TVET) colleges.

Any skills provision for employment under NFET programmes requires a relevant training delivery and enabling factors for job opportunities of the graduates. Kedrayate (2012) notes that the current role of NFET programmes is to help adults who did not complete their formal education and who are unskilled so that they may integrate into the labour market and generate income for their survival. This view suggests that the training delivery approach and resources at the NFET centre level lay a good foundation for fostering skills utilisation in the employment of the graduates. Previous researchers have examined the relevance of NFET for income generation (Islam, Mia & Sorcar, 2012; Blaak, Openjuru & Zeelen, 2012); and socio-economic empowerment of poor adults (Morton and Montgomery 2011; Akpama, Esang, Asor & Osang, 2011). Similarly, Georgiadou, et al. (2009) report practical skills acquisition by graduates but without mentioning the components of training delivery approach thereof. However, little is known about the effectiveness of the delivery approach of NFET centres in fostering skills utilisation in the wage or self-employment of the graduates.

Objectives of the Study

The purpose of the paper is to examine the effectiveness of delivery approach of NFET in fostering skills utilisation in the wage or self-employment of the graduates in South Africa. The study aimed to achieve the following objectives:

- To examine the effectiveness of training delivery approach of NFET on acquiring technical skills necessary to work without supervision.
- To examine the effectiveness of training delivery approach of NFET on acquiring business skills necessary for managing small businesses.
- To examine the skills utilisation in the wage or self-employment of the graduates.

Research Questions

- How effective was the training delivery approach of NFET in fostering technical skills acquisition?
- How effective was the training delivery approach of NFET in fostering business skills acquisition?

- To what extent did graduates utilise the acquired skills in the wage or self-employment?

Theoretical framework

The human capital theory serves as the theoretical framework to guide the study. It examines the assumption that there is or should be a direct link between adult skills acquisition and employment. The human capital theory was developed by Theodore Schultz in the 1960s (Quintini, 2011; Desjardins & Rubenson, 2011). Human capital theory suggests that education or training raises the productivity of workers by imparting useful knowledge and skills, hence raising workers' future income by increasing their lifetime earnings (Furia, Castagna, Mattoscio & Scamuffa, 2010). Key to the human capital theory is the concept that acquisition of more knowledge and skills raises the value of a person's human capital, thereby increasing their employability, income potential and productivity (FengLiang, Xiaohao & Morgan, 2009).

A significant aspect of the human capital theory is the perceived link between skills acquisition and job opportunities. Human capital theory suggests that education directly augments individual skills and the ability to profit in the labour market (FengLiang, et al. (2009). However, it is significant to note that the human capital theory is criticised for focusing only on the long run supply side of the labour market and paying no attention to variables structuring the demand side such as the individual's occupation, job or job tasks (Desjardins & Rubenson, 2011). In the context of KwaZulu-Natal province, the theory helps understand how the provision of knowledge and employable skills may benefit poor adults to get jobs.

The practical implication of human capital theory for this paper is that an effective delivery approach of adult NFET can lead to job opportunities if there are other enabling factors for employment. In the context of this study, the provision of relevant NFET expands employment opportunities since educated and skilled adults can meaningfully involve in the economic activities of the community whereas unskilled adults find it difficult to be integrated into the labour market (Furia, et al., 2010). A significant aspect of this theory is that providing livelihood skills may benefit individual and poor adults to get jobs or to create small businesses in South Africa, hence improving their incomes.

Methodology

The study utilised a mixed methods research design (Creswell, 2013). The qualitative research design used multiple case studies and the quantitative research design was a survey (Babbie & Mouton, 2007; Werner, 2004). The sample was drawn from the education districts of Umlazi, Pinetown, ILembe and uMgungundlovu (Msunduzi) in the KwaZulu-Natal province. The sample consisted of NFET centres and adult trainees from both urban and rural

settings from the public and private NFET centres[2]. In the context of non-probability sampling, purposive sampling was used as a supplement to the stratified method to select 21 centres out of 326 (Nieuwenhuis, 2012).

Within the selected 21 NFET centres together with their 21 managers, the sample size consisted of 420 graduates. There were selection criteria of the sample. Firstly, a centre was selected if it provided technical and entrepreneurial skills to enable graduates to take up wage or self-employment in the field of agriculture, industry, services and small business activities. Secondly, a graduate was selected if he/she has completed the technical and/or entrepreneurial programme; and became wage employed, self-employed or remain unemployed after graduating.

Self-administered questionnaires were used to collect quantitative data from adult trainees, trainers and centre managers (Maree & Pietersen, 2012). The questionnaires included closed-ended questions. The questions used in the study were binary with 'yes or no' responses and multiple-choice questions which allowed the respondents to tick all answers that apply. Other questions contained a statement and a set of four categories namely, 'strongly agree', 'agree', 'neutral', 'disagree', and 'strongly disagree'. The quantitative data were analysed using Statistical Packages for Social Sciences (SPSS) software.

Following the view of Creswell (2009), to complement quantitative data, semi-structured interviews and field observation were used for data collection in the qualitative study. One-on-one semi-structured interviews were conducted with five centre managers and six self-employed graduates. The aim of the interviews was to better understand how trainees view the effectiveness of the skills training delivery approach used at the NFET centres and how they translated acquired skills into employment. With regard to observation, the researcher focused on the components of the training materials such as the training venue, instruction tools and workshop for a practical session at the centre. The data were analysed through thematic analysis (Nieuwenhuis, 2012; Fouché & Bartley, 2011). Data were coded, then sorted and classified to find common themes and sub-themes to be matched and compared with the findings on the sections and sub-sections of the quantitative findings.

Validity and reliability of instruments were a matter of concern during data collection and analysis. To this end, firstly, the researcher clearly conceptualised all constructs. Reliability increased when each measure indicated one and only one concept. Secondly, he used a precise level of measurement to increase reliability.

Findings and discussions

[2] In this paper, "private centre" means a non-profit training centre managed by non-profit organisations (NPOs), community-based organisations (CBOs) and church or other faith-based organisations (FBOs).

The quantitative findings are presented first, followed by the qualitative findings on the related themes which emerged from the interviews. The quantitative and qualitative findings are then jointly interpreted in order to shed more light on the views and concerns of managers, trainers and trainees in an integrated manner.

Acquisition of technical and business skills knowledge

The quantitative analysis of the finding reveals that most graduates (73.6%) reported having acquired technical skills, knowledge and competencies necessary to work in the wage or self-employment. Graduates were asked to indicate the extent to which they felt confident to work without supervision. According to the responses, 27.9% (117/420) of graduates felt very able to work without supervision, other 45.7% responded that they were able and 19.1% were fairly able to work without supervision whether for paid job or self-employment. Only 7.4% of graduates felt not confident to work independently. The overall responses indicate that 73.6% of graduates felt confident (very able and able) of acquiring skills and that they could work for somebody without supervision.

The effectiveness of training delivery approach of NFET on skills acquisition was also reported in the studies conducted by Tekle (2010), Islam and Mia (2007), and Georgiadou, et al. (2009). However, in the context of present study in KwaZulu-Natal (KZN), it is evident that no general conclusion can be drawn on the effectiveness of the training delivery approach contributing to technical skills acquisition. The reason is that only one NFET centre uses a workplace assessment and certification conducted by an external company, agency or employers. In connection with skills acquisition by graduates as result of training approach at NFET, King and Palmer (2007, p.49), doubt by saying that, "What does it mean to acquire skills?" This is because many skills training provisions in adult centres are usually of low-quality, trainees have little access to up-to-date equipment, are situated mostly in rural areas and training materials are insufficient.

It was significant to determine the effect of the training approach on business skills acquisition. To this end, the graduates were asked to give their opinions on the effectiveness of training delivery approach of NFET on acquiring business skills and competencies necessary for managing small businesses individually or in a team. In both public and private centres, some trainees studied SMME as a course on its own as part of business skills training. Yet others, in the case of most of the private centres offering technical skills training in tailoring, handicraft, agricultural technology, poultry and cooperatives, the provision of business skills training was taught alongside with technical skills or at the end of the training programmes.

The findings reveal that the private centres had higher scores on acquiring business skills and knowledge than in public centres. The reason is that private centres provide skills training for income-generating activities to enable trainees to become micro-entrepreneurs. To this end,

they teach most of the business skills and knowledge. Graduates from the public centres have very low scores on making use of the entrepreneurs' network (37.7%, 123/329), marketing of business (35.6%, 117/329) and financial management (35%, 115/329). These low scores imply a low level of competence necessary for managing small businesses individually or in teams.

In general, most graduates acquired business skills and knowledge for starting, growing and managing a small business. As innovative elements of training delivery, combining technical skills with business skills proved more relevant for the income-generating activities of graduates. These findings are in contrast with Haan's (2006) study whereby in public and privates centres graduates were not taught any business skills nor motivated to explore existing opportunities for self-employment.

Skills utilisation in the wage or self-employment of the graduates

It was revealed that trainees enrolled in training programmes with very high expectations of finding a job or opening an own small business. Even for the centre managers, the main objective of the training programmes is to successfully integrate the skilled adults in the labour market. Table 1 presents the findings on the distribution of types of work before training by post-training occupations.

Table 1 Types of work undertaken by trainees before and after training

Types of work before training	**Total (n=420)**		**Wage-employed after training**		**Self-employed after training**		**Unemployed after training**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Unemployed	206	50.86	45	21.84	40	19.41	120	58.25
Domestic worker	40	9.88	10	25	18	45	12	30
Full-time job	34	8.39	16	47.05	6	17.64	12	35.29
Part-time job	70	17.28	27	38.6	11	15.7	32	45.7
Contract worker	32	7.9	18	56.25	2	6.25	12	37.5
Farmer (Agricultural worker)	16	3.96	-	-	14	87.5	2	12.5
Paid gardener	5	1.23	2	40	-	-	3	60
Other	2	0.5	-	-	1	50	1	50

Notes The percentages are within the types of work before training (total of rows)

Analysis of the quantitative data in Table 1 reveals that, of the 50.9% (or 206/420) of graduates who were unemployed before enrolling in training programmes, 41.3% (or 85/206) became wage or self-employed immediately after graduating. Many graduates claimed to be in both wage and self-employment at the same time, especially those trained in private centres. Some graduates got jobs in the Department of Social Development, community-

based organisations (CBOs) or non-governmental organisations (NGOs) while also running a micro-enterprise at home. As reflected in Table 1 above, 28 out of 40) of domestic workers became wage or self-employed after graduating from NFET programmes.

Furthermore, the qualitative findings revealed that the effectiveness of training delivery approach on the employability of a graduate also depended on the human and material resources available at the centre. Responses of three self-employed graduates explain the link business skills acquisition and self-employment outcome. A graduate who joined the adult centre and trained in sewing and fashion design skills reported the following:

> *I believe that my success in sewing and fashion design business is due to the practice of technical and business skills acquired at my centre. The training centre prepared me for the world of work in my current small business. My trainers paid great attention to individual trainees. After six months of training, I became competent and confident in technical skills in sewing any type of fashion garment and operating any type of sewing machine. The centre also trained me in business skills. The business training focused on entrepreneurship, managing a workshop, marketing strategies, basic bookkeeping and quality insurance of our products.*

A self-employed graduate in tailoring micro- enterprise testified by saying:

> *I believe that my achievement in the micro-enterprise is due to the method of skills training at my centre and centre's support. The curriculum consisted of technical or practical skills in sewing and of business skills related to sewing industry. With regard to the technical skills training, all the resources and materials for practical training were in the centre's workshop. Trainers focused on each learner to ensure that no one was left behind in understanding a particular task related to skills. The business skills training component entailed training in entrepreneurship, marketing, and drawing up a business plan.*

Another graduate who studied SMME also said:

> *I believe that the establishment in the micro-enterprise is due to the methods of teaching skills to adults our centre uses and centre's support to graduates though it is not enough. In the first phase, we were trained in technical or practical skills in sewing. Towards the end of the training programme, they trained us in business skills related to sewing industry. In our workshop, there were types of sewing machines, all the tools and fabrics we needed for the technical skills training. Trainers focused on each individual trainee to ensure that at the end of the lesson everyone understands and does the work by him or herself. The business skills programme involved training in entrepreneurship, marketing, basic bookkeeping and drawing up a business plan.*

The case studies of self-employed trainees provide evidence of the effectiveness of this training delivery approach. Connecting the study's findings to Blaak, et al.'s (2012) argument, during study tours, trainees could observe various income generating programmes in different settings. It appears that different successful businesses inspired them to imitate good practice for future endeavour.

The effectiveness of training delivery approach in terms of getting paid jobs or opening an own small business is 52.4% after graduation. Graduates from the private centres are more likely to become employed than in public centres. The results are reasonable as compared to the expanded unemployment rate of 24% in KZN (Stats SA, 2017, p.8). These findings are different from Morton and Montgomery's (2011) study in the Hashemite Kingdom of Jordan. The graduates acquired some livelihood skills and life skills which were not transferable in the labour market in order to improve their lives.

Application of the theoretical framework to the research findings

The research findings in relation to the theoretical framework imply that the acquisition of knowledge and skills can help adult graduates compete with others in the labour market. A lack of or limited education and training is directly linked to unemployment and hence is a significant contributor to unemployment. In relation to the human capital theory, Furia, et al. (2010) argue that education and training expand employment opportunities since educated and skilled adults can be productive in the society whereas unskilled adults find it difficult to be integrated in the labour market. In view of the findings, the paper contributes to the knowledge and practice of NFET by understanding how NFET programmes can be constituted for employment within the context of human capital theory by recognising relationships and the interdependence between technical and business skills acquisition and the skills utilisation in the wage or self-employment.

However, as limitation of the human capital theory on the macro-level, it is significant to note that the theory is criticised for focusing only on the long run supply side of the labour market and paying no attention to variables structuring the demand side such as the individual's occupation or job tasks (Desjardins & Rubenson, 2011). Thus, relevant training delivery approach in general and skills training acquisition for unemployed adults cannot on its own achieve the desired outcomes without conducive or supportive environments for employment.

Conclusions and recommendations

In the existence of job opportunities for low skilled adults, training delivery approach of adult NFET lays a good foundation for employment. It is evident from the findings that most of the graduates acquired technical skills to work without supervision and business skills necessary to manage small businesses. In the context of KZN, the findings suggest that training delivery approach was effective for the adult NFET programmes focusing on self-employment in micro-enterprises of graduates. The reality is that individual graduates who participated in the

private centres had a higher probability of becoming wage or self-employed. The reason is that most private NFET centres focus on income-generating activities in micro-enterprises either as an individual or in groups; they strive to connect training delivery approach to the types of income-generating activities.

The overall effectiveness of NFET programme consists of 52.4% of the graduates who utilised the skills in the wage or self-employment of the graduates. Based on these findings, the author concludes that the training delivery approach was effective only for the centres that linked adult NFET programmes to income-generating activities in micro-enterprises or co-operatives. The findings imply that NFET programmes can be relevant tools to foster employment in South Africa. Within the context of human capital theory, the implication for the findings is that NFET programmes can reduce unemployment by recognising relationships and the interdependence between technical and business skills acquisition, and the skills utilisation in the wage or self-employment of the graduates. Based on the findings and conclusions, the paper provides three major recommendations. Firstly, centre managers should ensure that training delivery approaches match with the available income-generating activities in the local community. Secondly, centre managers in partnership with stakeholders should identify potential labour-markets and income-generating opportunities for the trainees prior to training interventions. Thirdly, the centre managers and trainers should motivate trainees for self-employment because the chances to find wage employment are very few for NFET graduates with low skills.

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OS SABERES DAS COMUNIDADES LOCAIS E OS MECANISMOS DE ATRIBUIÇÃO DOS NOMES NO DISTRITO DE MAGUDE – PROVÍNCIA DE MAPUTO

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Resumo
A presente pesquisa enquadra-se no tópico da educação, muito concretamente no que concerne ao conhecimento indígena. Este artigo é o resultado de uma pesquisa que o Centro de Estudos de Políticas Educativas da Universidade Pedagógica de Moçambique vem desenvolvendo há cerca de seis anos. Tal pesquisa incide nas comunidades da Província Maputo, abarcando as três zonas: Bela Vista – Distrito de Matutuine, zona Sul. A escolha das três zonas justifica-se pelo facto de pretendermos abarcar a diversidade cultural que a Província possui. Esta pesquisa, tem como cerne a comunidade de Motaze, que fica no Distrito de Magude, Norte da Província. Aqui, nossa intenção era a de auscultar que mecanismos estão envoltos na atribuição de nomes. Para esta pesquisa, nos cingimos apenas na atribuição dos nomes do gado bovino e nas crianças recém – nascidas. Assim, a partir de uma pesquisa qualitativa, no caso com recurso à etnografia e com recurso à etnometodologia, pesquisamos as comunidades de Motaze, tendo privilegiado aso detentores de opinião, como sejam líderes comunitários, líderes religiosos, curandeiros e pais e encarregados de educação. A nossa pergunta de partida era, que mecanismos (sociais, culturais e antropológicos) estão imbuídos na atribuição dos nomes ao gado bovino e as crianças recém-nascidas? Que função didáctico pedagógico está por detrás da atribuição destes nomes? Haveria alguma função linguística nesta acção? Que autoridade moral e social possui a pessoa que pode e deve atribuir estes nomes nesta comunidade? No processo de ensino e aprendizagem, que currículo devemos desenhar nas nossas escolas para acomodar tal fenómeno? A partir das entrevistas e da observação à esta população – alvo, concluímos que existem elementos de ordem sócio cultural e antropológica que subjazem nos mecanismos de atribuição dos nomes nestas comunidades locais, elementos estes que estão presentes nos saberes locais destas comunidades. Além disso, encontramos também elementos de ordem didáctico pedagógica cultural nesta acção e que tal nomeação só pode ser feita por elementos que detêm uma certa autoridade na comunidade local. Em termos curriculares, existem elementos neste mecanismo de atribuição de nomes que podem ser transpostos para os saberes escolares. Para tal, sugere-se aos fazedores das políticas públicas educacionais que na formação de professores haja espaço que este possa possuir ferramentas que o possibilite embrenhar-se nas comunidades e de lá busque elementos dos saberes locais que podem ser validados e legitimados e transpostos para os saberes escolares.

Palavras – chave: Saberes Locais; Saberes Escolares; Didáctica; Atribuição de nome; Maputo; Moçambique

INDIGENOUS KNOWLEDGE AND NAMING MECHANISMS IN THE DISTRICT OF MAGUDE - PROVINCE OF MAPUTO

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ABSTRACT

The present research fits the topic of education, in particular with regard to indigenous knowledge. This article is the result of a research that the Center of Studies of Educational Policies of the Pedagogical University of Mozambique has been developing for about six years. This research focuses on the communities of Maputo Province, covering the three zones: Bela Vista - Matutuine District, South Zone. The choice of the three zones is justified by the fact that we intend to embrace the cultural diversity that the Province possesses. This research has as its core the community of Motaze, which is in the District of Magude, North of the Province. Here, our intention was to listen to what mechanisms are involved in naming. For this research, we only focus on the attribution of cattle names and newborn children. Thus, based on a qualitative research, in the case with ethnography and with the use of ethnomethodology, we investigated the communities of Motaze, having privileged opinion holders, such as community leaders, religious leaders, healers and parents and caregivers. Our starting question was, what mechanisms (social, cultural and anthropological) are imbued with naming cattle and newborn children? What educational didactic function is behind the attribution of these names? Would there be any linguistic function in this action? What moral and social authority does the person have and who can and should assign these names in this community? In the teaching and learning process, what curriculum should we design in our schools to accommodate such a phenomenon? From interviews and observation to this target population, we conclude that there are socio - cultural and anthropological elements that underlie the mechanisms of naming in these local communities, elements that are present in the local knowledge of these communities. In addition, we find elements of didactic pedagogical cultural order in this action and that such appointment can only be made by elements that hold a certain authority in the local community. In terms of curriculum, there are elements in this mechanism of naming that can be transposed to the school knowledge. To this end, it is suggested to the makers of educational public policies that in the formation of teachers, there is room for the teacher to possess tools that allow him to get involved in the communities and from there to search for elements of local knowledge that can be validated and legitimized and transposed to the school knowledge

Keywords: Local Knowledge; School Knowledge; Didactics; Name attribution; Maputo; Mozambique

Introdução

Um estudo sobre os saberes locais tem uma grande importância porque, de um lado, a orientação mundial para a educação é a construção do conhecimento que ligue o ser humano com o seu meio cultural. Nesse sentido, a responsabilidade da educação é descobrir os fundamentos culturais dos alunos para reforçar a solidariedade dos grupos. De outro, respondendo aos apelos de Jomtien (1990), segundo qual o desenvolvimento da educação de cada país passa, necessariamente, pelo resgate das culturas locais, Moçambique introduziu, no Ensino Básico, o Currículo Local, uma componente do currículo nacional que integra aspectos de cultura local.

Ao se olhar Moçambique, como uma nação, contempla-se, outrossim, uma diversidade de regiões e de grupos étnicos-linguísticos, que retractam não apenas a divisão geográfica, como também, com grande ênfase e em igual proporção, uma multiplicidade de povos com manifestações culturais distintas. Nestas se incluem a filosofia de vida, a arte, a ciência, a dança, a música, a língua, os rituais religiosos, contemplando um rol de saberes no concernente à formas de ser, conviver, fazer e conhecer o mundo que os rodeia que se tornam importantes na formação de suas identidades socioculturais, peculiares, tornando-os diferentes de outros povos, tanto dentro dos limites do país como fora destes.

Assim, existem vários autores que se têm preocupado no estudo dos saberes locais em Moçambique e sua relação sobre os saberes escolares. De entre estes, há a destacar os casos de Capece (2016), na sua obra "O resgate do saber das comunidades locais: sugestões para a melhoria do ensino de Ciências Naturais do 1º grau, onde defende que os saberes que as comunidades locais detêm, quando bem sistematizados, podem e devem ser apropriados e socializados para o currículo oficial. Ou seja, os saberes locais possuem elementos e têm uma intencionalidade que são de grande valor e que podem e devem ser resgatados para o saber escolar; Castiano (2011) argumentando que o Currículo Local favor a busca dos saberes das comunidades para serem ensinados na escola; Basílio (2013) com o argumento o currículo deve buscar os fundamentos culturais dos alunos para reforçar a solidariedade e construir as identidades dos grupos.

Em Moçambique, os estudos sobre os saberes locais estão patentes no Plano Curricular do Ensino Básico PCEB (2003) que é o resultado da Reforma Curricular de 2003/2007, onde o Currículo Local é descrito como sendo a grande inovação que traz a tese de que os alunos, já a partir do Ensino Básico deve ser portadores dos saberes locais que estão presentes nas suas comunidades e,

> (…) Para tal, a escola tem à sua disposição um tempo de 20% do total do tempo previso, para a introdução de conteúdos locais que se julgarem relevantes (…) as matérias propostas para o Currículo Local devem ser integradas nas diferentes disciplinas curriculares, o que pressupõe uma planificação adequada das loções. (PCEB, 2003: 27).

Estes posicionamentos conformam com os ideais de Freire (1992) que sustenta sobre a necessidade de trazer os conhecimentos das comunidades locais para o processo de ensino e aprendizagem o que perpassa pela observação de três etapas fundamentes a saber: desenvolvimento de uma pesquisa que as características essenciais dessas comunidades; cruzamento entre o saber local com os saberes escolares (universais organizados na forma de disciplinas e o papel do professor como agente mediador entre estes dois tipos de saberes. É aqui onde Capece (2016) introduz o conceito de tensão entre os saberes locais e os saberes universais, e segundo ele, nesta tensão, o que se assiste é que os fazedores das políticas públicas darem maior primazia nos saberes universais em detrimento dos saberes locais.

Esta pesquisa surge para desconstruir este paradigma, com a defesa da tese de que, na construção dos currículos escolares, também devem ser contemplados os saberes locais que estão fecundos nas comunidades locais. É por isso que fomos à comunidade de Motaze, Distrito de Magude, a Norte da Província de Maputo para nos apropriarmos sobre que saberes locais (indígenas) estão mesclados na atribuição de nomes nestas comunidades e como é que estes saberes podem e devem ser incorporados nos currículos oficiais?

As premissas acima expostas encontram a sua justificativa no facto de que os saberes locais se cruzam e se impregnam com os saberes escolares. Eles se comunicam com temas escolares tornando-se temas transversais no currículo. Os saberes locais aqui são entendidos como um conjunto de conhecimentos, práticas, atitudes, habilidades e experiências partilhadas no quotidiano das pessoas de uma dada comunidade.

A partir da relevância das culturas, as reflexões em torno dos saberes locais e sua articulação na escola começaram a dominar os dois âmbitos: filosófico e educacional. No âmbito filosófico e educacional porque estes se cruzam no tratamento das questões do saber. Ao se cruzarem, se relacionam na definição dos currículos nacional e local. A filosofia intervém para questionar os critérios de produção e disseminação do saber, a natureza e o valor do saber e o tipo de saber que a escola tende a socializar para tornar aprendizagem dos alunos mais relevante e eficaz. A Educação preocupa-se em conceber currículos não só meramente técnicos, mas também que abrangem as esferas sociais e culturais.

Os pressupostos acima estão fundados naquela premissa segundo a qual, o conhecimento acumulado na humanidade é obra de *artesãos* que costuram a partir de suas experiências quotidianas e são esses espaços e tempos culturais que dão sentido e significado aos seus saberes. O currículo é reflexo da participação de *artesanatos locais*, no diálogo entre as culturas locais (interculturalidade) e entre as áreas de conhecimento (a interdisciplinaridade).

A partir dessa diversidade, formulamos as seguintes questões: Que processos educativos adoptar, então, de modo a conciliar esta riqueza cultural, acientífica e a necessidade da construção de uma identidade nacional? Que caminho a escola deverá percorrer para tornar-se um espaço de convivência e não de enfraquecimento das relações e das particularidades comunitárias? Que saberes se tornaram pertinentes na formação da identidade nacional,

global, sem ferir as identidades locais? Em suma, que currículo para a escola moçambicana de modo a incluir esta riqueza manifestada pela diversidade cultural? Estas e outras inquietações são primordiais na medida em que se pretende construir um currículo baseado no respeito às culturas autóctones, às culturas locais, enraizadas no multiculturalismo.

Para responder à estas e outras questões realizamos a presente pesquisa na Província de Maputo, concretamente no distrito de Magude.

São objectivos da presente pesquisa, os seguintes:

a) Recolher os saberes e as experiências culturais que as comunidades locais detêm, relacionadas os mecanismos da indicação de nomes de gado bovino e às crianças recém – nascidas, na comunidade de Motaze, distrito de Magude;
b) Analisar os processos de produção e legitimação dos saberes locais desta comunidade, relativa à atribuição do nome em gado bovino e às crianças recém – nascidas
c) Sugerir as possibilidades de inclusão dos saberes das comunidades locais nos saberes escolares;
d) Recomendar aos fazedores das políticas públicas educacionais do país sobre a necessidade de formação de professores com competências de busca perante sobre que saberes locais existentes nas comunidades podem e devem ser resgatados para os saberes escolares.

PRESSUPOSTOS METODOLÓGICOS

Métodos de pesquisa

Triangulação de dados

Para esta pesquisa demos primazia à triangulação de dados, uma vez que esta permite alcançar a confirmação necessária de informações em relação às comunidades locais por nós pesquisada que nos permitiu aumentar a credibilidade na interpretação, isto porque ela implica reunir uma variedade de dados e métodos no mesmo tema. Implica, igualmente, realizar comparações múltiplas de um fenómeno único utilizando perspectivas diversas e múltiplos procedimento, Ademais, esta técnica permite abranger a máxima amplitude na descrição, explicação e compreensão do foco em estudo, considerando que um fenómeno social, como é o caso dos mecanismos de atribuição de nomes, apresenta raízes históricas, significados culturais e tem vínculos com a macro realidade social. Nesse sentido a triangulação ajuda a aumentar a confiança na interpretação do fenómeno em estudo e a perceber se o que o investigador observa e relata transmite o mesmo significado quando descoberto em circunstâncias diferentes. Além disso, ela confere uma consistência e confiabilidade dos dados em pesquisas qualitativas face à complementaridade de diferentes procedimentos e aumenta a validade da pesquisa. A triangulação na investigação social apresenta muitas vantagens, já que permite a combinação de vários métodos num só estudo. Esses métodos actuam como filtros através dos quais são captadas realidades de modo selectivo.

Método bibliográfico

Com o objectivo de nos apropriarmos sobre os estudos já feitos sobre os saberes locais, este método visa analisar de forma suficiente os materiais e as publicações de pesquisa inerentes à temática em estudo.

Para GIL (1996) a análise bibliográfica visa buscar informações sobre o estudo nas diferentes fontes secundárias, ao mesmo tempo que ajuda aclarar as prováveis zonas de penumbra em volta do assunto. Esta pesquisa é desenvolvida a partir do material já elaborado, constituído principalmente de livros, publicações periódicas, entre outros documentos impressos.

Método documental

Dependendo do desenho da investigação, existe uma gama de documentos não pessoais que podem ser usados numa pesquisa, como são os casos de textos oficiais, actas, regulamentos, dados estatísticos sobre um determinado fenómeno, fichas de inscrição, fichas de avaliação, cadernetas do aluno, entre outros.

Autores há como Bogdan e Biklen (1994) que enfatizam que os documentos não são apenas fontes de informação, como também, produtos sociais que a partir da sua análise podem-nos levar à compreensão de um conjunto, por vezes complexos e abrangentes de fenómenos que se relacionam entre si e passíveis de uma interpretação.
Documentos como Lei nº 4/83 de 23 de Março sobre o Sistema Nacional de Educação, (SNE). Sistema Nacional de Educação: Linhas Gerais e Lei nº 4/83 e Plano Curricular do Ensino Básico PCEB (2003) entre outros, se configuraram como relevantes para a presente pesquisa.

Técnicas e instrumentos de recolha de dados

Entrevista

A entrevista é definida por Amado (2013: 207) como um meio potencial de transferência de pura informação de uma pessoa para outra pessoa e é um método, por excelência, de recolha de informação. Para GIL (2002: 115, esta constitui uma técnica que envolve duas pessoas "face a face" e em que uma delas formula questões e a outra responde. Trata-se, pois, de uma técnica de recolha de dados em que o pesquisador formula questões previamente elaboradas e anota as respostas sob ponto de vista do respondente. Esta técnica permite um contacto directo entre o pesquisador e o pesquisado.

Para a nossa pesquisa, uma vez que estávamos interessados em recolher depoimentos sobre os saberes das comunidades locais sobre os mecanismos da atribuição de nomes esta técnica permitiu obter dados acerca do que a comunidade de Motaze, distrito de Magude "*sabe, crê ou espera, sente ou deseja, pretende fazer ou fez, bem como a respeito de suas explicações ou razões para qualquer das coisas precedentes* (Amado, 2013: 207).

Para a materialização desta técnica, usamos como instrumento de recolha de dados, o guião de entrevista[3]**.** O Guião de entrevista é um instrumento que a pesquisadora elaborou para a orientação da conversa tendo em conta os objectivos da pesquisa. Nessa ordem de ideia, Amado (2013: 214),

> (…) Concebe o guião de entrevista como uma estrutura constituída de blocos temáticos e de objectivos. Trata-se de um instrumento que ajuda a organizar e a gerir as questões a serem feitas aos entrevistados. Essas questões são o prenúncio do que se deve alcançar no processo de recolha de dados e permite ao pesquisador a sistematização da informação recolhida.

Validação dos instrumentos de recolha de dados

Em se tratando de uma pesquisa qualitativa, o cumprimento rigoroso dos procedimentos que levem à validade dos instrumentos conduz, igualmente, à fiabilidade dos resultados que são recolhidos. Para esta pesquisa só efectuamos entrevistas abertas aos nossos informantes na comunidade que foi objecto desta pesquisa. Este instrumento de recolha de dados foi elaborado tendo em vista o problema e os objectivos do estudo. Assim, o guião de entrevistas foi primeiramente submetido aos especialistas em matérias relacionadas com os saberes locais e às pesquisas que privilegiam a etnometodologia como método de pesquisa.

Feita a submissão recebemos correcções que foram prontamente acomodadas. Só após estas rectificações é que o guião de entrevistas foi aplicado no campo da pesquisa.

O segundo procedimento para a validação dos instrumentos de recolha de dados foi a sua testagem no terreno. A testagem, foi feita numa pequena comunidade seleccionada aleatoriamente na comunidade de Motaze, no distrito de Magude. Foi feita, igualmente, a reestruturação linguística de algumas questões constantes no guião de entrevistas. Deste modo, podemos afirmar sem evasivas, que o teste piloto permitiu reestruturar, clarificar e adequar algumas perguntas aos contextos da pesquisa.

População e delimitação da amostra

A literatura sobre a Teoria de Amostragem reconhece que, em pesquisa, raramente é possível aceder à globalidade dos elementos da população ou universo, tecnicamente designada por população ou universo (Maroco & Bispo, 2005; Maroco, 2007). A amostra é entendida como o subconjunto do universo ou da população e é dela que se estabelecem ou se estimam as características desse universo ou da população. Na pesquisa social, como é o caso vertente, são utilizados diversos tipos de amostragem, que pode ser probabilística e não probabilística. Este último não se baseia em fundamentos de ordem estatística, dependendo do critério do investigador e do assunto a estudar.

[3] Por questões de economia de espaço não inserimos aqui o referido guião.

Para Maroco (2007: 31) neste tipo de amostragem a probabilidade de um determinado elemento pertencer à amostra não é igual à dos restantes elementos. Pelo caracter da nossa pesquisa, optamos pela amostragem não probabilística, cuja característica central é a constituição da amostra por conveniência do estudo, não sendo necessário, neste tipo de casos, a representatividade numérica das fontes. É um tipo de amostragem prático e aconselhável em certos objectos de estudo de caso em Ciências Sociais. Trata-se de um processo de selecção de participantes baseado nos objectivos e conveniência do estudo e não em função do tamanho da amostra com intenção de aferir generalização dos resultados. Esta forma de selecção permitiu-nos obter o máximo da informação útil dos nossos informantes nobre o que pretendíamos saber nesta pesquisa.

Assim sendo, a nossa amostra foi constituída por líderes comunitários, líderes religiosos, curandeiros, anciões, sendo que todos eles são detentores de opinião e respeitados nesta comunidade.

ANÁLISE E DISCUSSÃO DOS RESULTADOS

Sobre os mecanismos com relação à nomeação do gado bovino

A propósito do nome, o censo comum lembra-nos que, independentemente de ser comum ou próprio, ele serve para designar as coisas[4], as pessoas[5], os animais[6] ou os lugares[7]. Do ponto de vista linguístico, o nome, independentemente da sua morfologia, função ou funcionamento, é uma realização linguística de cumprimento variável que oscila entre a palavra[8] e a frase pronunciada, chamada, recitada ou evocada no dia – a – dia.

Naturalmente, embora raramente no dia – a – dia da comunidade, não se pode perder de vista que o nome, pode ser escrito, legível ou ilegível[9]. De facto, o nome em tanto que realização linguística, materializa uma determinada língua viva. Note-se que a mesma coisa, a mesma pessoa, o mesmo animal ou o mesmo lugar podem ser atribuídos vários nomes que por sua vez materializam várias línguas. Esta constatação leva-nos a sublinhar que existe um certo

[4] Objectos, produtos, fenómenos, acontecimentos….

[5] Vivas ou mortas, reais ou imaginárias….

[6] Domésticos ou selvagens, reais ou imaginários…

[7] Reais ou imaginários….

[8] Em tanto que palavra, pode ser uma palavra simples ou uma palavra composta.

[9] Tal é o caso da assinatura do nome das pessoas cuja principal função é para legitimar ou validar um documento (cheque, Certificado, Certidão, Diploma, Despacho, Decalcarão….).

paralelismo entre a pluralidade de nomes (polinomia[10]), a pluralidade de línguas (plurilinguismo[11]) e a pluralidade de identidades[12] que se manifestam em cada interacção social.

Do ponto de vista antropológico, importa destacar que o valor ou a significação dos nomes varia em função do contexto de uso, da situação de comunicação, dos actores sociais envolvidos e do momento em questão. Curiosamente, os nomes, subdividem-se igualmente em função das áreas de saber, isto é, saber popular e saber científico. Para ilustrar este facto basta lembrar que, a cada nome popular, corresponde um nome científico. Assim, o boi para os cientistas é *Bos Taurus*, a vaca é *Bos Taurus Taurus*, o cão é *Canis Lupus Familiaris*, o Leão é *Panthera Leo*[13] e assim em diante.

Aquando da nossa pesquisa sobre o funcionamento dos nomes locais na comunidade de Motaze, no distrito de Magude a norte da província de Maputo, questionamos sobre que mecanismos estão envolvidos os meandros sobre a nomeação do gado bovino? Das respostas várias que fomos sistematizando nos apercebemos que a nominação está longe de ser um simples acto de atribuir o nome. Antes pelo contrário, o acto de dar nome inscreve-se numa dinâmica bastante complexa, rica e astuciosa. Efectivamente, no que diz respeito aos nomes do gado bovino por exemplo, existe uma classificação taxonómica que, considerando a semelhança e a dissemelhança de características dos bovinos, agrupa-os em categorias específicas, ou seja, em nomes funcionais designados por exemplo *"Lungazana*" (castanho claro), como mostra a figura abaixo:

[10] No caso das pessoas, podemos destacar por exemplo o nome oficial, o nome tradicional, o nome da infância, o nome da adolescência, enfim, nomes, pseudónimos ou alcunhas. O mesmo acontece com o nome dos lugares e das coisas.

[11] Em África, raras são as pessoas que falam uma só língua, independentemente do seu estatuto. Aliás, estas mesmas línguas têm os seus respectivos nomes cujos critérios de atribuição são bastante complexos e até polémicos. Assim, a diferença entre língua e dialecto, é ao mesmo tempo ideológica (línguas oficiais e línguas vernáculas) e científica (língua e variedade de língua).

[12] A pluralidade identitária remete-nos à etnia, religião, nacionalidade, sexo, idade, profissão condensados no mesmo ser, ou seja, às diferentes variáveis sociológicas que definem o perfil de cada actor social.

[13] Fonte: http://www.todabiologia.com/zoologia/nomes_animais.htm (4/7/2017)

Figura 1: Lungazana (castanho claro)

Esta designação se atribui ao boi cujo aspecto da pele mais predominante castanho claro.
Se o tom predominante for de manchas pretas, intercaladas de brancas, este recebe o nome de "Lhafukazi", cujo exemplar é o que se segue:

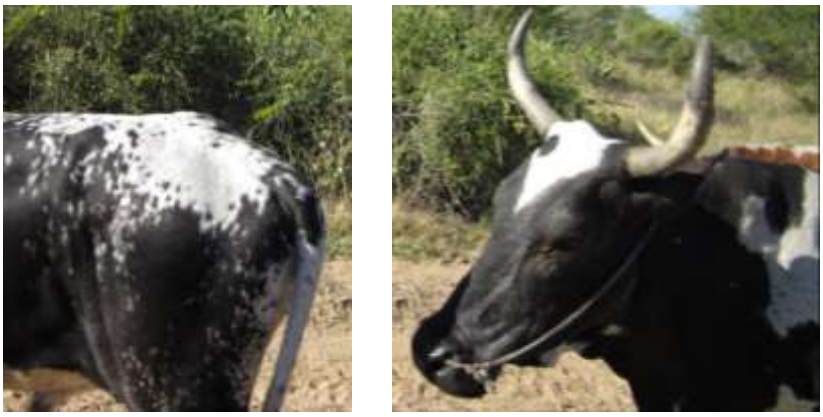

Figura 2: Lhavukazi (manchas brancas e pretas)

E, quando ostentar manchas brancas e vermelhas, este recebe o nome de "Nhokazi".

Figura 3: Nhokazi (manchas brancas e vermelhas)

Outrossim, quando tiver o tom preto abrilhantado, atribui-se lhe o nome de “Ntchilove”.

Figura 4: Ntchilove (preto escuro brilhante)

E se a predominância da cor for de um castanho escuro, o animal recebe o nome local de "Zotho", como o mostrado abaixo:

Figura 5: Zotho (castanho escuro)

Como se pode depreender, do ponto de vista antropológico, em tanto que linguagem, tanto os nomes populares assim como os nomes científicos designam, determinam, classificam, significam, comunicam, transmitem, enfim, estão dotados de poder, saberes e valores que não devem ser encarrados de maneira hierárquica, pois ambos têm a sua legitimidade epistémica.

Recusar esta legitimidade é promover “epistemicídio” que é actualmente posto em causa, pois os cientistas procuram estabelecer um diálogo e uma ponte entre os saberes de natureza epistémica diferente. Mas afinal de contas quem atribui o nome ? De onde é que vem o nome? Quisemos saber. Eis a seguir o que sinteticamente ouvimos das comunidades locais:

Em relação à atribuição dos nomes ao gado bovino na comunidade de Motaze, distrito de Magude, na província de Maputo, esta depende dos traços mais característicos dos animais e também é em função do porte físico dos mesmos.

Relataram os nossos interlocutores que, a este respeito, existem uma liberdade para o efeito. Porém, a motivação varia de pessoa para pessoa. Um dos nossos entrevistados referiu que na atribuição dos nomes do seu rebanho usou outros critérios diferentes dos acima citados. Conta ele que um dos seus animais chama-se “*Carmona”,* que era seu nome de infância,

quando ele era pastor ***de*** bois. Um outro relato se refere a um episódio de um senhor que terá recebido um dinheiro, através duma indemnização e com ele comprou uma manada de bois. Como forma de eternizar o acto, ele atribuiu o nome da instituição donde recebeu o tal fundo a um dos animais, no caso, recebeu o nome de "*Sekeka Motaze*".

Um outro episódio que nos foi relatado em relação aos meandros que bordejam a atribuição dos nomes dos bois foi nos informado assim por um dos entrevistados:

> (…) Há casos dos nativos que trabalham nas minas do "*Rand*" na vizinha África do Sul. De lá trazem largas somas de dinheiro e investem localmente. Acontece que um dos investimentos pode ser a criação do gado bovino. Para homenagear e eternizar o acto, atribuem o nome da "Mina" onde trabalharam e ganharam o referido dinheiro que mais tarde foi investido na compra do gado a um dos animais, por sinal o mais estimado. Revelaram existirem nomes como "*Harmony Gold*'', "*Anglogold Ashanti*", "*Gold Fields Ltd*'', "*Anglo American South Africa*'', por aí em diante.

Para dizer enfim, que existe uma relação biunívoca entre o nome a atribuir ao animal e uma acção concreta, real, visível, tangível, do quotidiano da comunidade local.
Esta última designação taxonómica, estes mesmos bovinos ostentam tanto antropónimos[14] plurilingues tradicionais ou modernos de familiares ou de pessoas conhecidas dentro e fora da comunidade (em particular, nas minas da África do sul) para imortalizá-los, tanto topónimo de zona de origem ou de zonas por onde passaram os habitantes da comunidade, tanto nomes de companhias mineiras, como atras dissemos, onde trabalharam certos membros da comunidade.

Repare-se que aqui o bovino sem deixar de ser "Lhafukazi", "Nhokazi", "Nhokazi", "Ntchilove" ou "Zotho", afirma-se como um suporte de linguagem para assumir uma função social específica, ou seja para homenagear alguém em tanto que antropónimo, para valorizar um lugar em tanto que topónimo ou ainda para preservar a memória individual ou colectiva em tanto que nome da ex-empresa mineira. Os nomes em tanto que linguagens interpenetram-se sem distinção entre antropónimos, topónimos, nomes comuns e nomes próprios. Esta porosidade de fronteiras leva-nos a constatar que, mais do que um simples animal, o bovino afirma-se como uma escola, um livro, uma biblioteca que preserva a memória da comunidade. É por isso que defendemos que este tipo de mensagem precisa perpassar pelos saberes escolares, através de uma didáctica e de uma metodologia apropriada. E, para que isso aconteça, é preciso os fazedores das politicas publicas educacionais, dêem primazia à formação de professores, uma formação que dê possibilidades para que este possa contemplar a possibilidade de apropriação da riqueza cultural e acientífica que está presente, às vezes de forma latente nessas comunidades locais. É minha convicção que, na Formação de

[14] Pelo carácter sagrado destes antropónimos e para honrar o pedido dos nossos entrevistados, preferimos não mencioná-los.

Educadores, deve haver espaço para a criação duma metodologia que leve o educador ao "garimpo", à procura dos saberes locais junto às comunidades, para que seja capaz de "apreender" o que existe do universal no saber local, convertendo-o em saber escolar.

Sobre os mecanismos com relação à nomeação das crianças recém – nascidos

O que acima relatamos em relação à nomeação do gado bovino, também é extensiva quanto à atribuição dos nomes às crianças recém-nascidas. Sobre este assunto, os nossos entrevistados afiançaram-nos que cada criança possui, regra geral, dois nomes, um formal e outro tradicional. Este último é atribuído à criança depois da consulta aos antepassados. Como é que isso acontece?

Inquirimos e a resposta veio de chofre:

> (…) Quando em bebé a criança chora frequente e interruptamente e perante o acto, a família fica preocupada e como solução vão ao curandeiro a fim de fazer consulta para saber da razão de tanto choro. Aí são informados da existência de um espírito do antepassado que está "zangado" pelo facto de terem atribuído um nome "estranho" ao filho. Para fazer "desaparecer" esta zanga, a criança lhe é atribuído o nome que o espírito do antepassado evocar, isto em plena sessão do curandeirismo, depois de "batidas" as pedras mágicas. Nestes casos, é frequente atribuir-se o nome à criança, primeiro dum defunto da parte materna e se isso não funcionar, mais tarde recorre-se ao nome dum defunto da parte paterna.

Eis um dos episódios por nós recolhidos que evidencia a teia sobre a qual é tecida a atribuição dos nomes às crianças recém – nascidas:

> Quando se nasce um(a) filho(a), é possível dar o nome do pai, do avô. Antigamente, fazia-se uma consulta para ver se o nome atribuído vai "pegar" ou não vai "pegar", pois, às vezes a criança ficava doente, chorava muito; assim, fazia-se a consulta e via-se se era o nome certo ou não. Caso nome pegasse, a criança parava de chorar, ficava melhor. Este nome, funcionava como um nome de defesa, como se diz agora, de Anjos.

Defendem os nossos interlocutores que existem na comunidade de Motaze, no Distrito de Magude, dois cenários envoltos na atribuição de nomes: O primeiro cenário é preventivo ou meteorológico e procede pela antecipação antes de a situação "amargar", procura-se o nome certo através de consultas aos espíritos dos antepassados; o segundo cenário, reactivo, surge como resposta a um problema detectado, choros, doenças, etc. A criança podia ter dois nomes: um nome "civilizado" e um nome tradicional. O primeiro é usado no registo oficial, na escola, no posto de trabalho e o segundo é usado no meio familiar, na comunidade. Quando se vai à consulta no curandeiro, é este nome que é evocado por este este que comunica entre a pessoa visada e os antepassados.

Mas também nos relataram de casos de atribuição de nomes humilhantes e pejorativos às crianças, mormente quando estes são fruto de relações ilegais. Nestes casos, recebem os

nomes, por exemplo, de “kwatine”, que significa “matem”, ou de “thceleni” que significa, cinquenta centavos, para comparar com algo de baixo valor; “mbuene”, para dizer que a criança nasceu na casa segunda, “nwabjana”, significando algo desprezível, ruim, comparando-o a um cão, e por ai em diante.

Paradoxalmente, quando se trata de sancionar uma infracção grave, tal como o adultério por exemplo, o antropónimo perde deliberadamente o seu carácter humano para funcionar como uma espécie de sentença para toda vida, não para humilhar o portador do nome, mas sim para disciplinar o infractor. De facto, como vimos atrás, um mineiro da zona traído pela mulher que teve bebé com um outro homem, decidiu manter o casamento e não separar-se dela na condição de ele ter a liberdade de atribuir o nome de Kwatine ao recém nascido, do changana, que significa mato, para designar um filho feito fora da casa. Perante a comunidade e a infractora, Kwatine funciona como uma represália sem derrame de sangue. Aqui o nome ganha uma dimensão performativa, pois é uma forma de agir. Como podemos observar, o funcionamento do nome na comunidade é dinâmico, metódico e complexo. Parafraseando Saussure que considera a língua como uma instituição social assimilada a um conjunto de convecções, não é exagero considerar que o nome é uma instituição social na comunidade e talvez, a principal instituição da comunidade.

Aqui chegados, é razoável questionar: quais são as realidades que são nomeadas? Quais são as implicações sociais, culturais, políticas e económicas dos nomes? Em Suma, que relação existe entre esta “nominação” e o currículo e que poder está imbuído na atribuição de nomes? O texto seguinte procura responder isso.

CONCLUSÕES

A partir dos depoimentos das comunidades locais que são objecto desta pesquisa, mormente na comunidade de Motaze, Distrito de Magude, norte da Província de Maputo, pudemos concluir que tais comunidades possuem mecanismos próprios de atribuição de nomes quer ao gado bovino, que nas crianças recém – nascidas.

Em relação ao gado bovino, existem duas formas de atribuição de nomes, sendo a primeira, baseada na cor que mais predomina no animal e a segunda, baseada na tendência de perpetuar o nome da mina das terras do Rand, onde o actual criador era trabalhador na vizinha República Sul Africana.

Em relação à atribuição dos nomes à crianças recém – nascidas, encontramos também duas situações: uma que dá primazia à questões antropológicas, onde a ligação entre o bebé e os antepassados é fundamental. É aqui onde assistimos os casos em que, a criança, sendo-lhe inicialmente atribuído um nome em que os seus ancestrais não “concordam”, esta tem choros constantes ou padece de uma enfermidade prolongada.

Quer a primeira situação, quer a segunda, o problema é resolvido com o recurso à consulta de um curandeiro. Este, depois de “falar”, com os espíritos relacionados com os antepassados da

criança, é que se lhe atribui o nome. É preciso frisar que este não é o nome oficial. A criança tem um nome, oficial, do registo e tem o outro, da comunidade e é com este segundo que esta se comunica com os seus ancestrais. Quando vai ao curandeiro, é este nome que é evocado e não o oficial.

Na atribuição dos nomes às crianças recém – nascidas há também o lado pejorativo, quendo esta criança é o resultado duma relação menos recomendável pelas comunidades locais.
Quer num caso como no outro, quem atribui os nomes não é qualquer membro da comunidade: deve ser um membro imbuído de um poder simbólico na comunidade, aquela figura impoluta, detentor de um respeito inquestionável na comunidade. Regra geral, esta pessoa constitui o elo de ligação entre a comunidade e os antepassados e é nela em que a comunidade faz consultas caso alguma maldade perturbe a vida normal da sociedade.

Também vimos que neste exercício de atribuição de nomes, há elementos dos saberes escolares que podem e devem ser resgatados. Isto porque esta prática na comunidade está em desuso, sendo apenas detentora por pessoas mais velhas na comunidade. Estando em desuso, temos que encontrar plataformas, sobretudo no chamado currículo oculto, de como estas temáticas podem ser salvaguardas em sala de aulas com o recurso a interdisciplinaridade e temas transversais. Isso por se reconhecer que há elementos educativos nestas práticas.

Por outro lado, da análise às falas dos nossos depoentes e a partir de uma abordagem etnometodológica de cunho etnográfico, constatamos que existem elementos culturais e curriculares que estão, de uma forma latente nestas comunidades. Estes saberes que as comunidades locais detêm, quando bem sistematizados, podem e devem ser apropriados e socializados para o saber escolar uma vez que tais saberes possuem elementos e têm uma intencionalidade que são de grande valor.

RECOMENDAÇOES

Do acima exposto, somos de recomendar aos fazedores das políticas educativas do país, para a necessidade de encontrar plataformas de como resgatar e valorizar saberes patentes nas comunidades locais para os saberes escolares de modo a constituem elementos que podem ser contemplados no currículo oficial.

Para que tais pressupostos sejam profícuos, torna-se imperioso que na Formação de Educadores, haja espaço para a criação duma metodologia que leve o educador ao “garimpo”, à procura dos saberes locais junto às comunidades, para que seja capaz de “apreender” o que existe do universal no saber local, convertendo-o em saber escolar.

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SUSTAINING RURAL COMMUNITIES THROUGH SKILLS DEVELOPMENT: A CASE STUDY OF MANYELEDI

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Abstract
The skilling of the rural population is crucial in the development of rural areas and in sustaining the lives of people of these areas. The purpose of this paper is to report on the extent to which a rural development project has managed to instill hope in lives of a rural community. A project called Bokamoso Agricultural Project was initiated in Manyeledi. Manyeledi is an impoverished, rural area in the North-West province of South Africa. The area is characterised by high temperatures, low rainfall patterns and sandy soil or desert-like soil conditions which are not conducive for crop farming. In addition, the rate of unemployment is very high in the area, mainly due to lack of industries. The Bokamoso Agricultural Project focused on training participants on how to do crop farming in sandy soil or desert-like soil conditions. The project applies a slow water release irrigation system which promotes constant water supply to the crops – since the sandy conditions of the soil do not have adequate water retention characteristics. The irrigation system uses a technology whereby the water pipes have very small holes which continuously release water in small drops – to ensure constant supply of water to the crops. The project taught them how to effectively water their plants and thus produce vegetables of good quality. Apart from crop farming, the project also taught them how to read and write – since this was a condition for proceeding with the training. The study was qualitative in nature, with focus group interviews as the instrument used to collect data. The focus group was made of eight participants.It was found that the success of the small scale crop farming the participants engaged with at the Bokamoso Project project could play a major role in promoting sustainability and food security among communities in the rural areas. The participants also saw a potential to become entrepreneurs by selling their produce, the potential to use crop farming as a means of generating income. Therefore, the Bokamoso Agricultural Project had brought about hope in the lives of the participants, particularly with regard to crop farming, basic literacy, communality and entrepreneurship. It is recommended that similar projects be initiated in other the rural areas in order to improve the lives of people in these areas.

Keywords: Rural development, skills training, sustainability, adult education.

Introduction

The importance of rural development cannot be overemphasised. Studies indicate 70% of the world's poor people live in the rural areas (Ravallion, Chen & Sangraula, 2007). The people living in the rural areas depend mainly on agriculture and natural resources for survival – due to little or no industrialisation (Ravallion, Chen & Sangraula, 2007). The rural people are not

only isolated from economic opportunities, but they are also isolated from education and knowledge of rights, as well as from social services such as health, sanitation and safety/security (Morgan, 2011). It is estimated that around 1 billion rural households in developing countries lack access to safe water supplies and information about the way governments function (United Nations, 2009). In addition to all the above-mentioned problems facing rural people, extreme poverty makes life in the rural areas very difficult and unsustainable. The rural areas' remoteness to cities exacerbate the problems of poverty, hunger and unemployment in the rural areas. These problems are more pronounced in Africa than in European countries. To confirm this view, around 38% of worldwide cropland is affected by human-induced soil degradation in Europe, but this figure is 65% in Africa (United Nations, 2009). Alleviating the scourge of poverty and improving access to and availability of food for rural people in Africa should be priority issues that continuously receive the attention of governments and non-governmental organisations (World Bank, 2007).

Despite all the problems that affect rural areas, however, the development in these areas had been ignored, leading to absurd poverty, unemployment, shorter lifespans and abandonment of these areas (United Nations, 2009). Consequently, many people from the rural areas move to cities in search for a better life and opportunities. In many countries the migration of people from one area to another is spontaneous, and is determined by circumstances and preferences of individuals. However, in South Africa, particularly during the *apartheid* era, the migration of the African people was legislated: Africans were forcefully removed from areas which were earmarked for occupation by whites, and placed in areas which were to be occupied by African people in accordance with their ethnicity (Skelcher, 2003). In most instances, the areas occupied by Africans (called Bantustans) were strategically identified to offer no agricultural and industrialisation opportunities for Africans – due to the poor quality of soil, the uneven and mountainous structure of the terrain, and the huge distances from markets and resources (Skelcher, 2003). Consequently, the rates of poverty and unemployment in the Bantustans were very high, forcing the African people to work in the cities and in the mining areas, and visiting home only during weekends and on leave days (Walk & Mkwananzi, 2015). Although the Bantustan policies have been abolished, communities living in the former Bantustans are still exposed to high rates of poverty and unemployment, and the problems related to soil and terrain still persist. In addition, the closure of mining shafts and the low economic growth in South Africa implies that fewer and fewer people find jobs in the cities, while the majority of the rural people are subjected to hunger, poverty and unemployment. Hence many people in these areas depend on handouts from relatives and non-governmental organisations, as well as social grants from the government (Merten, 2017). There is an urgent need to uplift these communities out of poverty and starvation.

This was an interpretive study which explored the experiences of undergoing training on crop farming by a selection of African adults in a rural area. Studies around African adult people undergoing training for purposes of survival and self-sustenance have not yet been earnestly pursued.

The purpose of this paper is to indicate how a rural development programme, Bokamoso, has the potential to contribute to the upliftment of the rural population of Manyeledi, in the North-West province of South Africa.

Background

The purpose of all rural development programmes is to reduce or eradicate poverty, improve food security and create employment – thus sustaining the lives of people in the rural areas (Morgan, 2011). These programmes are important social protection tools which many governments use to supplement the income of poor households and create job opportunities for the unemployed people of the area (Moragues-Faus, Sonnino & Marsden, 2017). For instance, in Malawi, the evaluation of a rural programme, the Malawi Social Action Fund, revealed that the use of fertilisers in their maize fields increased production and created employment for the rural people (Beegle, Galasso & Goldberg, 2017). The Malawian government found it compelling to support these farmers with fertilisers. In Chad, when the peanut and sesame farmers were supported to access land and to reach markets, they produced more for the markets, indicating a clear relationship between production and access to land and markets (Corsi, Marchisio & Orsi, 2017). In Botswana, the community-based natural resource management (CBNRM) is designed to alleviate rural poverty by empowering communities to manage resources for long-term social, economic and ecological benefits (Beegle, et al, 2017) . The CBNRM activities were carried out with the assistance of Non-Governmental Organisations (NGOs) and donor agencies. Since these programmes take place on a small scale and depend on natural resources, the element of vulnerability is high. This implies that any slight change in the factors sustaining the project has a potential to destroy the project. For instance, any changes in climate patterns, labour supply and the functioning of the equipment may seriously affect the sustainability of the programme (Ding, Chen, Hilborn & Chen, 2017). In many rural community programmes, the involvement of government and the NGOs, in terms of funding, provision of land and support with logistics such as training, providing equipment and resources, plays a major role in the sustainability of the programmes. The purpose of such support by governments and NGOs is to provide members of the community with knowledge and resources so as to ensure long-term sustainability of these communities. Moragues-Faus and Sonnino (2017) believe that vulnerability of rural programmes is caused by failure to deal with cross-scale dynamics, inequalities in rights and entitlements, as well as power imbalances. Also, any negative perceptions by stakeholders or participants may negatively affect the project.

The role of education and training in the rural development projects is crucial. The value of training is not only to develop knowledge and capabilities required to do the job properly, but also to impart knowledge about issues such as commercialisation, marketing and agribusiness (Landini, Brites & Rebole, 2017; Sulaiman & Davis, 2012). The advantage of training in projects is that it is a form of in-service training, which implies that learning takes place on the job, in contexts of real action and in settings focused on problems that arise from concrete

practice (Landini et al, 2017). The training of individuals participating in rural development projects also promote the ideas of social learning and communities of practice. Social learning is conceived as an interactive process wherein knowledge is shared and co-constructed within interactions of individuals; whereas communities of practice is when participants have a joint enterprise, build relationships and commitments around mutual engagement, and share a repertoire of routines, experiences, stories and ways of thinking and doing things (Morgan, 2011; Saether, 2010). Therefore, participants in the training of a rural development programme share a common understanding of their situation, a common goal of alleviating poverty and improving their circumstances, and a common plan of action for executing tasks and responsibilities.

Theoretical Framework

In this study the human ecosystem framework was adopted**.** The core requirement of an ecosystem is that the physical environment and organisms in a specified area are functionally linked (Pickett, Burch, Dalton, Foresman, Grove & Rowntree, 1997). A human ecosystem is defined as a coherent system of biophysical and social factors capable of adaptation and sustainability over time (Pickett, Cadenasso & Grove, 2004). The human ecosystems occur at several spatial scales, and these scales are hierarchically linked. Thus, a family unit, community, country, region, nation and even the global population can be treated as human ecosystems (Machlis, Force & Dalton, 1994). A rural community can be considered a human ecosystem, if it exhibits boundaries, resource flows, social structures and continuity over time (Machlis et al, 1994). According to Pickett et al (2004) the most important factors in the human ecosystem are the social resources, social processes and cultural resources. The social resources and social processes include information, human population, financial capital and labour; while the cultural resources include organisational structures, beliefs and myths (Pickett et al, 2004). Machlis, Force and Burch (1997) believe that the unequal allocation of critical biogeophysical, social, and cultural resources can significantly affect the social order as expressed in social identity (ethnicity, age, gender and class), norms of behaviour, wealth, power, status, knowledge and territory.

The situation of rural people is characterised by the coexistence and interdependence of nature, the environment and the people or human beings. The implication of coexistence and interdependence is that the available resources, the knowledge that the people can access, the powers that control the available resources and the means to access and process the available resources should be managed in such a way that they benefit the rural people as a component of the ecosystem. Thus, any uneven distribution of resources has a potential negative affect on the existence of the ecosystem.

Methodology

Setting

Bokamoso is a rural development project, whose purpose is the training of the local people on crop farming on a small scale. The project is a partnership between Bokamoso Community Impact and the Department of Adult Education and Youth Development (ABET) of the University of South Africa (UNISA). The project took place in Manyeledi. Manyeledi is an impoverished part of a former Bantustan called Bophuthatswana, and it is mainly occupied by Setswana speaking people. The participants in the project are unemployed adults, who joined the project for the purpose of learning how to do crop farming in order to provide food for themselves and to earn extra income from selling their produce to the local community and businesses. The area is semi-desert and the soil is sandy. This implies that the rainfall patterns, as well as the water retention abilities of the soil are also very low, making crop farming extremely difficult. However, the project applies a slow water release irrigation system which promotes constant water supply to the crops – since the sandy conditions of the soil do not have adequate water retention characteristics. The irrigation system uses a technology whereby the water pipes have very small holes which continuously release water in small drops – to ensure constant supply of water to the crops.

Research approach

Focus group interviews were used to collect data. Focus group interviews are important in gathering information on social or behavioural patterns of a group of people (Carey, 2015). In this study, all the participants had attended the training offered by the Bokamoso Project, and all shared the same ambitions of producing fresh vegetables for their families and for the markets. Hence focus group interviews were appropriate for this study. Participants were informed that participation was voluntary, and that they should be free to express their opinions (Carey, 2015). The focus group interviews allowed further probing for purposes of clarity. Terre Blanche, Durrheim and Painter (2006) believe that probing enables the researcher to explore the participants' subjective realities, feelings, reasoning and belief systems The study relies on self-reporting and expression of opinion by the participants. The discussions were facilitated under certain subheadings, then observational notes were taken and tape-recording was used to ensure that all relevant information was captured (Carey, 2015). The purpose of arranging the discussions under subheadings was to provide some order to the discussions (Carey, 2015). The interviews took place at the Bokamoso Centre, and the participants knew long in advance of the dates of the interviews.

Participants

The project trained eight students in its first year, and all eight graduands of the project participated in this study (two female and six male participants). Their ages ranged between 22 and 69 years. All the participants were unemployed. All the participants had basic reading and writing skills – which was required for the crop farming. The basic reading and writing skill (the literacy programme) was offered by the University of South Africa (UNISA), through the Department of Adult Basic Education and Youth Development (ABET). It was

mainly the older participants who also undertook the literacy programme, since the younger participants were already literate when they came to the project. The literacy programme helped the participants with basic reading, writing and numeracy.

Results

Since the focus group discussions were arranged in topics, the results were also arranged in topics. The following topics guided the discussions: Purpose of joining the training, what was learnt from the training, challenges encountered during and after the training, how the skills would benefit the area. The results of each topic will be fully discussed below:

Purpose of joining the training

All the participants reported that their main purpose for joining the project was to be able to produce fresh vegetables for the markets. Selling their produce seemed more important than feeding their families. The participants also saw crop farming as a venture that could lead them to stock farming and other businesses. One participant said 'I will be a rich farmer'; and another one said 'I will own a shop'.

What was learnt from the training

The participants reported that prior to the training, they could not produce any vegetables, despite that they tried various methods of planting but none of those methods were successful. However, with the skills of planting, watering and plant care which they have acquired during the training they had managed, for the first time in their lives, to produce crops of a very high quality. One participant said: 'I have never seen the crop quality before, even if I tried very hard'. Another participant said: 'The quality of produce here is sometimes better than those we see at the big supermarkets. So we can provide these shops with good quality product'.

The entrepreneurial skills which formed part of their training were also viewed as very helpful in providing them with the necessary guidance for establishing their own businesses. One participant expressed his confidence as follows: 'I feel I can run a successful business'.

Challenges encountered during and after the training

The participants mentioned a number of problems which they experienced during and after the training. The main problem that they experienced during the training was transport to the training centre. Initially the municipality provided transport, but this later became erratic and ultimately unavailable. This alone led to many of their fellow trainees dropping out of the project – since the area is rural and there was no public transport they could use to reach the training centre. Many had to walk long distances under extreme weather conditions. One participant said the following: 'We had to be physically and mentally strong to complete the programme'. Another participant said 'Coming to the training centre gave me hope for the future'.

The most serious challenge that the participants faced after the completion of the programme was that although land had been identified for them to do crop farming, there was no fence, no implements and no start-up capital. The participants reported that they had approached a number of people, government officials and tribal authorities without any success. Since all of them were unemployed, their newly acquired skills remained their only hope for earning a living and sustaining their livelihoods. One expressed his frustration as follows: 'I feel useless and unable to help myself'. However, there was still hope that one day their efforts would yield positive results. One participant said: 'I still believe that my skill will help me somehow'.

General benefits of the training for rural people

The participants believed that the area would benefit dramatically from the people who successfully completed the training – since more and more people would acquire the skills and establish their own farming ventures, start small businesses and simply transfer the skills to their neighbours. They also mentioned that they were already helping their neighbours with planting challenges. One participant said: 'My neighbours already ask me for advice on crop farming'. Another participant said: 'With good support from the government we can establish a big market here and create jobs'.

Discussion

Contrary to the general view that rural people are concerned with survival and food, the participants seemed more concerned with earning money and building wealth as a priority, and not providing food for the family. It could be that the food struggles had been so common that they no longer stressed them, but were accepted as a way of life. It could also imply concern for the future – since earning money could help them to buy livestock and to start other businesses. Therefore, wealth and future were found to be more important than food provision.

The benefits of the training had a positive impact on the participants. The participants were not only proud of the skills they had acquired from the training, but they also felt so confident and believed that, in terms of product quality, they could compete favourably with established farmers who provided fresh produce to the chain stores. The view confirms the participants' intention to produce quality vegetables for the markets and turn their ventures into successful businesses. The business intentions of the participants, if realised, have a potential of creating job opportunities and sustaining livelihoods in the rural areas. Even if the 'big business' mentality would not materialise, there is a possibility that the trained adults could produce vegetables on a small scale and sell to the local people – thus earning income for themselves and moving out of the feelings of stress and hopelessness, which characterise lives of many people who live in the rural areas (Morgan, 2011).

Despite the difficulties which these participants faced, they still managed to complete the programme, and they still hoped that their skill would help them to sustain their lives. The

participants who completed the programme displayed a lot of resilience – a condition for surviving under difficult circumstances (Morgan, 2011). The participants had to choose between dropping out of the programme and face poverty with no skill, and completing the programme and face poverty with some skills. According to Morgan (2011) mutual engagement, joint enterprise and shared repertoires may have contributed a lot to the adult learners' willingness to complete the programme. The farmers associate and engage in learning more readily with peers if they are driven by similar attitudes, objectives and identity (Morgan, 2011).

The participants viewed the Bokamoso Project as having the potential to address issues of poverty, unemployment and hopelessness in the community. The participants believed that their neighbours and other people in the area may benefit from the businesses, small scale crop farming and the informal information sharing that may be spearheaded by those who completed the programme. The African culture promotes the spirit of 'Ubuntu' which is understood to mean 'I am what I am because of who we all are' (Sarpong, Bi & Amankwah-Amoah, 2016). The practices which bring people together, such as stokvels, family gatherings and family feasts are common in the African culture – as a way of promoting togetherness (Downing & Hastings-Tolsma, 2016). Hence the success of those who completed the programme could be of benefit to other members of the community.

Conclusion

The rural population faces serious problems, of which poverty, unemployment and lack of knowledge are paramount. This situation makes living in the rural areas extremely difficult. However, research has shown that intervention in a form of training programmes can go a long way in sustaining livelihoods of people living in the rural areas. The Bokamoso Project has provided participants with skills that could make a positive impact in their lives. The advantage of the Bokamoso Project is that it provided participants with education and training, which they will never loose – unlike other rural upliftment projects which provide participants with materials without proper training. Therefore, the skills acquired through the training at the Bokamoso Project should sustain the participants' livelihoods in the rural areas.

Recommendations

The introduction of training programmes for the rural people would go a long way in sustaining lives of these people. Education and training, not handouts, should form the basis of such training. The government and the NGOs could form partnership in establishing such programmes. The business sector could also be approached as they could play a role in community upliftment.

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