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Predictors of Pharmacy Students' Performances in First Year at a University of Technology in Gauteng Province: Analysis Using Hierarchical Regression Models

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ABSTRACT

This cross-sectional quantitative study sought to identify factors associated with the performance of first-year pharmacy students. It made use of secondary data obtained from the Department of Pharmaceutical Sciences at Tshwane University of Technology (TUT). Even after adjusting for Grade 12 science subjects, the results of hierarchical logistic regression models show that male students were slightly less likely than female students to pass the first year of pharmacy in 2015, 2016, and 2017. Academic performance predictors could be used to reconfigure admissions criteria. As a result, a better understanding of the factors influencing pharmacy student performance may aid pharmacy educators in developing effective interventions to improve student performance. Identifying new predictors of academic performance may assist the TUT pharmacy school to retain and graduate better pharmacists. This study suggests that a similar study should be conducted using structural equation models and hierarchical regression models to confirm the current results using a data set containing other important predictors mentioned in previous studies.

Keywords: Hierarchical logistic regression model, Pharmacy programme, Student performance, Selection criteria, Predictors

INTRODUCTION

University students are potential nation builders who aspire to become professionals such as engineers, medical doctors, managers, and scientists, and materialize a nation's dreams (Talib & Sansgiry, 2012). Students in every discipline in universities have many obstacles to overcome to achieve their endeavour of optimal academic performance (Talib & Sansgiry, 2012). Adjustment which is a psychological concept that refers to the behaviour that permits people to meet the demands of the environment (Baker & Siryk, 1984), is a multi-dimensional process of interaction between an individual and his/her environment, in an attempt to bring about harmony between the demands and needs of the individual and his/her environment (Baker & Siryk, 1984). Adjusting to university involves the complementary processes of de-socialisation and socialisation (Pascarella & Terenzini, 1991). De-socialisation entails the changing or discarding of selected values, beliefs, and traits one brings to university in response to the university experience. Thus, a university environment demands certain behavioural patterns from students. Studies have found the adjustment to the university environment to be an important factor in predicting university outcomes (Petersen, Louw, & Dumont, 2009).

In addition, Petersen, Louw, and Dumont (2009) investigated the roles that adjustment and other psychosocial factors

(such as help-seeking, academic motivation, self-esteem, perceived stress, and perceived academic overload) played in the university success of students from disadvantaged backgrounds in terms of both education and economics. According to the authors, the psychosocial variables explained the students' adjustment to university life more effectively than the academic performance group did.

Medical school is inherently "stressful" and demanding, especially pharmacy education. The overwhelming amount of information the student must learn severely restricts their ability to unwind and have fun. The academic performance of students has been linked to a variety of factors. This study's goal was to examine how predictors affected the first-year performance of pharmacy students.

MOTIVATION FOR STUDY

The current study was designed to paint a picture of a specific South African province and is likely to add a developing country's perspective to such a complex structure, which will help to resolve the issue of male and female students performing better academically. It may also serve as a springboard for paying close attention to and working harder with the weaker group to improve academic performance. The study might be useful for creating and implementing policies to raise the performance of students in the weaker group.

LITERATURE REVIEW

Since 1994, with the ushering in of South Africa's democratic dispensation, the number of students enrolled in South Africa's higher education institutions has increased tremendously (Badat, 2016; Letsoalo, 2021). Accompanying this growth of access to higher education is increasing diversity amongst the student population. Students from different social and cultural backgrounds, with different experiences and varying levels of education, bring with them different needs and academic potential (McKenzie & Schweitzer, 2001). The challenge for universities is to recognise this diversity of needs and cater to this changing and heterogeneous population of students.

Student academic performance and achievement occupy a very important place in education, as it does in the learning process (Sikhwari, 2016). However, the transition from secondary school to university represents a major change for many students. For example, more often than not, students enrolling for first-year university courses do not have sufficient, technical or computational knowledge, do not possess sufficient logical reasoning skills (Letsoalo, 2019) and are not accustomed to reading and thinking about mathematics using mathematical texts (Kajander & Lovric, 2005).

Students at university have access to both study opportunities and opportunities for psychosocial development (Tao, Dong, Pratt, Hunsberger, & Pancer, 2000). Therefore, life transitions, such as university attendance, entail the reconstruction of relationships between the individual and the environment. Among others, one element contributing to students' lack of preparation for postsecondary coursework is the disconnect between high school curricula and university expectations (Kizito, Munyakazi, & Basuayi, 2016). According to Harwell, Post, Cutler, Maeda, Anderson, Norman, and Medhanie (2009), school mathematics does not adequately prepare students for university mathematics. School mathematics curricula are examination driven and encourage a surface approach to learning, with an emphasis on mastering algorithms and procedures. University learning, on the other

hand, requires a deeper approach to learning, involving conceptual understanding and problem-solving (Harwell, et al., 2009; Kizito, Munyakazi, & Basuayi, 2016).

Factors Associated with Students' performances.

Studies identified and assessed a plethora of factors influencing academic performance. Therefore, this paper is not exhaustive. For example, Battle and Michael (2002), Ready (2010), and Letsoalo, Maoto, and Chuene (2018) support the notion that student performance is influenced by a variety of demographic, socioeconomic, psychological, and environmental factors. Letsoalo (2019) reported that students' race was not an important factor in predicting student performance in the first year of the pharmacy programme. Young and Fraser (1994) reported that both gender and school-level differences contributed significantly toward explaining variations in student performance. Among others, Tinklin (2003), and Cor and Brocks (2018) reported that student gender is a significant predictor of academic attainment. However, Liao and Adams (1977), Steele-Johnson and Leas (2013), and Gillette, et al. (2017) reported that gender is not a significant predictor of whether a student will pass or not. While gender is considered to play a role in determining student success, studies have yielded inconsistent results.

Kyei and Nemaorani (2014) concluded that parents' socio-economic status, age, sex, location of the school, the type of school - private or public, the average number of students in a class [class size], and competence in the English language, in case of second language speakers, may affect student performance. The Department of Education, Training and Employment (DETE) of Queensland established a link between school attendance and students' socioeconomic status. Ready (2010) reported that those students who live in poverty are 25% more likely to miss at least three days of school per month. While some student absences are unavoidable or understandable due to illness or the like, many are not. Unforeseen circumstances, such as a medical emergency, a family death, a court subpoena, a traffic/transportation delay, or personal illnesses, contribute significantly to students' absences from class, with low performers more likely to report this as a reason for their absences than high performers (Hidayat, Vansal, Kim, Sullivan, & Salbu, 2012). The relationship between attendance rates and student performance is such that being absent on a daily basis has a negative impact on performance (Balfanz & Byrnes, 2012; Russo & Talbert-Johnson, 2013).

Social support is one of the most important protective factors for determining an adjustment to the university freshmen (Tao, Dong, Pratt, Hunsberger, & Pancer, 2000). Maton, et al. (1996) found that the function of social support from different sources varied across different cultural backgrounds. Specifically, parental support was more strongly related to Black students' adjustment, whereas peer support was more strongly related to White students' adjustment.

Financial difficulties are among the most frequent reasons given by poor South African students, especially Blacks, for not pursuing or completing their tertiary education. Students from low income, less educated families are most likely to drop out (Letseka & Maile, 2008). Arguably, socioeconomic status is associated with student performance.

Windle, Spronken-Smith, Smith, and Tucker (2018) reported that demographic variables, which include gender, are associated with lower GPA performances across the Bachelor of Pharmacy (BPharm)

programme they investigated; and that gender was associated with academic performance and failure. Therefore, gender was significantly associated with whether a student will succeed in the pharmacy programme, but conditionally. Different studies which examined the effect of demographic data reached different conclusions. The results obtained by Steele-Johnson and Leas (2013) demonstrated that researchers can gain a better understanding of race and gender differences in academic performance by examining the intersection of such effects.

McKenzie and Schweitzer (2001) found that previous academic performance is by far the most powerful predictor of university performance. They also reported that integration into university, self-efficacy, and employment responsibilities were predictors of university grades. Byrne and Flood (2008) found a significant relationship between prior academic achievement, prior knowledge of accounting, gender, motives, expectations, and preparedness for higher education, on the one hand, and academic performance in the first year of an accounting program, on the other hand, in a paper that examined the associations between prior academic achievement, prior knowledge of accounting, gender, motives, expectations, and preparedness for higher education.

Giuliano, Gortney, and Binienda (2016) evaluated predictors of student performance in the pharmacy curriculum outcomes assessment (PCOA) examination. Significant predictors included GPA, Pharmacy College Admissions Test (PCAT) reading, accommodators (compared to assimilators), and students who did not prefer reading. According to Gillette, et al. (2017), the PCAT, the Health Science Reasoning Test (HSRT), and cumulative pharmacy GPA were the only consistently significant predictors of higher PCOA total scores.

Mar, Barnett, Tang, Sasaki-Hill, Kuperberg, and Knapp (2010) hypothesised that prior to matriculation into pharmacy school, experience gained in the pharmacy workplace may have resulted in the accumulation of skills that could be useful during the students' pharmacy school education. However, it is unclear whether specific types of pharmacy experiences differ in their importance in completing either classroom education, experiential (APPE) education, or both. However, their result indicated no significant difference in academic or clinical performance between those students with prior pharmacy experience and those without. Furthermore, sub-analyses by work setting, position type, and substantial pharmacy work experience revealed no relationship between student performance.

The emotions which students experience within the learning environment are known to be related to important outcomes, such as academic success and academic adjustment, and also to student health and well-being (Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012). The importance of personality and coping style in relation to stress in students has been examined in many studies, with stress being found to be the most strongly related to neuroticism and coping style. The results obtained by Conard and Matthews (2008) indicate that neuroticism is a stronger determinant of student stress than perceived workload. Many students experience difficulty in managing the academic workload at university (Bitzer & Troskie-De Bruin, 2004). The way students conceive of learning relates to the way they approach their studies which, consequently, affects the quality of their learning outcomes.

Stress can have an impact on learning and memory. Although an appropriate level of stress can improve learning ability (Kaplan

& Sadock, 2000), excessive stress can cause physical and mental health problems (Kaplan & Sadock, 2000; Sohail, 2013). Stress is defined as "the non-specific response of the body to any demand for change" and describes how the body reacts to external changes (Sohail, 2013). Stress among students could greatly affect their learning activities and general well-being. Waghachavare, Dhumale, Kadam, and Gore (2013) found a significant relationship between stress and various domains of undergraduate pharmacy students' quality of life. Sohail (2013), for example, reported that a higher level of stress is associated with poor academic performance. It is thus necessary to implement some personal and institutional strategies to reduce the impact of stress on pharmacy students' quality of life while encouraging the use of positive stress management strategies.

Educationally disadvantaged students seem to experience great difficulty in coping with the academic workload in their first year at university. The workload is one of the factors that influence the academic adaptation process during the first year in higher education (Bitzer & Troskie-De Bruin, 2004). The danger with the steep increase in the time necessary to cope with the workload at university is that students are not able to adapt effectively, either because they do not perceive the demands of the task correctly (Letsoalo, 2021) or because they do not know how to manage their time effectively.

Petersen, Louw and Dumont (2009, p. 102) stressed that students' perceptions of the demands of the academic tasks and their perceptions of their ability to succeed in completing the tasks influence the amount of effort they put into academic work, and an insufficient amount of effort may lead to academic failure. Difficulties with managing academic workload have been shown to harm academic adjustment to university and academic performance (Chambel & Curral, 2005; Petersen, Louw, & Dumont, 2009).

Admission criteria into pharmacy programme

For many years, it has been a source of concern to select the most promising students for admission to pharmacy schools. Aside from the commitment to select the most qualified applicants, schools of pharmacy or pharmacy educators face a number of other challenges, including the responsibility to maintain quality educational programs, the need for a diverse student body, the desire to reduce student attrition, and the development and support of traditional and non-traditional educational programs.

South Africa's tertiary institutions use selection criteria that are based on an admission point score (APS) review. The final APS consists of the results obtained in all subjects completed in Grade 12. The marks obtained in these subjects are converted using the APS conversion table and are then totalled, as presented in Table 1. If the candidate matriculated before 2008 in South Africa or has matriculated in another country, then the university where the application is being processed has a specific grading tool to convert these candidates' marks to the relevant APS as approved by the South African Qualification Authority. While prepharmacy courses vary by school of pharmacy, most require a number of courses in general and organic chemistry, biology, physics, and mathematics. [Organic] Chemistry and physics constitute physical science. Other required prepharmacy classes vary by institution.

Given the importance of producing effective professionals for the health and wellbeing of the public, selecting top-quality

students who will master their training is of critical importance (Kuncel, et al., 2005)

Table 1. Conversion Table for Converting Percentage to Admission Point Score

Overall Percentage of marks obtained in the subject	Admission Point Score (APS)
80 - 100	7
70 - 79	6
60 - 69	5
50 - 59	4
40 - 49	3
30 - 39	2
20 - 29	1
Less than 20	0

One of the most challenging issues that schools of pharmacy face are the identification of students most capable of successful completion of the professional programme, as well as their successful entrance into, and their safe and effective performance in, the pharmacy profession (Schlesselman & Coleman, 2011). Thus, admissions decisions must be consistent in identifying successful students and, eventually, good practitioners (Allen & Bond, 2001).

Selection criteria are in place to select only those candidates who are viable and most suited to, not only succeed in the course but, to excel in the field after graduation (Unni, et al., 2011; Wilcox & Lawson, 2018). Mar, et al. (2010) have indicated that previous pharmacy work experience is likely to play a role in the admission decision process, as it is assumed that applicants with prior workplace exposure have a more complete understanding of the role of pharmacists in a practice setting. The institution may have additional requirements, depending on the qualification that a student wants to pursue, with each programme having specific requirements (Letsoalo, 2019).

The Pharmacy College Admission Test (PCAT), which has been used since 1974 in the United States (Kuncel, et al., 2005), is a standardised test used by pharmacy programmes to select students. It is considered by most pharmacy programmes and in 2003 was required by 51 pharmacy programmes as an effective tool to be used for making admissions decisions (Kuncel, et al., 2005). For example, the University of Texas uses the PCAT as a supplement to the universal point scale. Thus, grade point average GPA and PCAT scores have formed the backbone of didactic measures used in the pharmacy admissions process to predict future success (Wilcox & Lawson, 2018). In most of the studies addressing the academic success of pharmacy students, the institutions concerned have used pharmacy GPA scores as an indicator of academic performance in pharmacy schools. Although GPA is the conventional method used to measure student performance, GPA may not be as sensitive as the raw assessment scores (Unni, et al., 2011).

Pharmacists remain an important component of any society since their knowledge and experience, collectively called skills, help individuals, especially patients, to live a better life (American Public Health Association, 2018). Therefore, it is crucial for institutions that offer pharmacy programmes to select students who will be prosperous, not only in the pharmacy programme but in the profession as well. Since pharmacy programmes are expensive to run, a sound selection process is important, to avoid the personal and organizational costs of making a poor choice (Unni et al., 2011).

Kuncel et al. (2005) indicated that the PCAT and pre-pharmacy GPA were positively correlated with the first-year GPA;

implying that both PCAT scores and pre-pharmacy GPAs were moderate to strong predictors of grades earned in pharmacy programmes. However, it is well known that one of the most important attributes of a successful clinician is the ability to think critically in patient care situations. In other words, a key to success in the health profession is critical thinking and one useful measure has been the California Critical Thinking Skills Test, CCTST (Wilcox & Lawson, 2018). As summarised in Shaw, Kennedy, Jensen and Sheridan (2015), there is considerable evidence that quantitative measures, such as grades in science and mathematics, pre-pharmacy GPAs, and scores in pre-admissions tests such as the PCAT and the Pharmacy Education Eligibility Test (PEET), are highly predictive of success during the pharmacy programme, of graduation rates, and success in national board examinations. For example, GPA and PCAT performance were reportedly significant predictors of academic performance in pharmacy (Stowe, et al., 2014).

Success as a clinical practitioner in any health profession requires solid critical thinking (CT) skills. It is assumed that surrogate measures of CT skills can be found in GPA and achievement test scores. Wilcox and Lawson (2018) highlighted that only a few studies to date have examined the correctness of this assumption. Selection procedures for pharmacy students in English speaking countries differ in the degree of emphasis placed on skills in communication and general academic ability. As such, a variety of non-didactic measures have also been utilised in the admissions selection process because of their perceived value and to offset the limitations of didactic measures. Some communication problems among students have been noted informally in the final year of a pharmacy programme in the United States (Norwood, Friedman, Lage, Stewart, & Robinson, 1986; Jones, 2000), as well as among Australian graduates by the Australian registration authorities during licensure reviews. One survey of preceptors and externs noted weaknesses or deficiencies in this area (Parish, 1993; Jones, 2000).

According to Shaw, Kennedy, Jensen, and Sheridan (2015), the majority of pharmacy schools used traditional selection processes. Approaches in pharmacy schools emphasised prior academic performance, particularly in science subjects. The authors discovered that, with one exception, all schools had some form of interview, with several schools moving to multiple mini-interviews (MMI). Interviews, on the other hand, produced mixed results [see Stowe et al. (2014) and McAndrew, Ellis, and Valentine (2017)].

STATISTICAL CONSIDERATIONS

The building of probabilistic models that describe, or appropriately approximate, the true generating mechanism of a phenomenon under study is an essential subject in data analysis (Ntzoufras, 2009; Hilbe, 2009). Regression analysis (a statistical technique for studying and modelling the relationship between variables) is a fundamental aspect of many research initiatives. Regression is the study of dependence, which is the process of identifying the function satisfied by the points on the scatterplot (Weisberg, 2005; Hilbe, 2009).

In a regression problem wherein only one predictor variable generically called X and one response variable called Y, the data consist of values (x_i, y_i) where $i = 1,2,\cdots,n$ of (X, Y) is observed on each of n units or cases. The goal of regression is to understand how the values of Y change as X is varied over its range of possible values. A case in which two or more independent variables are fitted in a model is called the multivariable

case. Therefore, the strength of a modelling technique lies in its ability to model many variables, some of which may be on different measurement scales (Hosmer & Lemeshow, 2000).

Many educational research problems call for the analysis and prediction of a binary outcome, e.g., whether a student will succeed at the university or not. Logistic regression sometimes called the logistic model or logit model, analyses the relationship between multiple independent variables and a categorical dependent variable, and estimates the probability of occurrence of an event by fitting data to a logistic curve (Agresti, 2002).

Standard statistical techniques, such as [simple] linear regression, assume that each of the primary observations [that make up a dataset] is independent of all of the others (Burton, Gurrin, & Sly, 1998). There has been a great deal of interest recently in mixed-effect models for repeated measures data. Those are data generated by observing several study units repeatedly under differing experimental conditions where the study units are assumed to constitute a random sample from a target population (Letsoalo, 2018). Observations from repeated measure studies or clustered measure studies are usually correlated. Linear mixed-effects models, also called linear mixed models, multilevel regression models, or hierarchical regression models, are an extension of simple and multiple linear regression models that allow both fixed and random effects and are particularly used when data are clustered and non-independent (Wu & Zhang, 2006). Such data are often available in hierarchical structures. The hierarchical regression model for binary data is called the logistic hierarchical model. The linear mixed-effects model is written as (Wu & Zhang, 2006, p. 18; Goldstein, 2011; Hox, 2013):

$$\boldsymbol{y}_i = \boldsymbol{X}_i\beta + \boldsymbol{Z}_i b_i + \boldsymbol{\varepsilon_i}$$

where $\boldsymbol{b}_i \sim N(\boldsymbol{0}, \boldsymbol{D})$, $\varepsilon_i \sim N(\boldsymbol{0}, \boldsymbol{R}_i)$, $i = 1,2,\cdots,n$ and $\boldsymbol{y}_i$ and $\boldsymbol{\varepsilon_i}$ are respectively, the vectors of responses and measurement errors for the i^{th} subject, and β and b_i are respectively, the vectors of fixed-effects (population parameters) and random-effects (individual parameters), and $\boldsymbol{X}_i$ and $\boldsymbol{Z}_i$ are the associated fixed-effects and random-effects design matrices, respectively (Wu & Zhang, 2006). The data used in this study is an example of clustered data because a student was observed multiple times through his or her performances in different registered modules. Details of hierarchical models are provided by Raudwnbush and Bryk (2002), Gelman and Hill (2006), Wu and Zhang (2006), and Hox, Moerbeek, and Van de Schoot (2017), among others.

PROBLEM STATEMENT

Disparities between males and females in academic performance, especially achievement in science, technology, engineering, and mathematics (STEM) subjects, has been a concern among educators for several decades (Guiso, Monte, Sapienza, & Zingales, 2008). The STEM subjects are used to select suitable students for the Bachelor of Pharmacy (BPharm) programmes at tertiary institutions. The BPharm programme offered at the Tshwane University of Technology (TUT) is a four-year undergraduate degree that uses both a problem- and outcomes-based learning (PBL) approach to teaching. The process of implementing PBL is called the Seven-Jump-Step process (Mabope & Meyer, 2014).

During the admissions process, pharmacy schools consider a number of criteria (in order) to identify students who will perform well academically and professionally while enrolled in the programme. TUT admits students to its pharmacy programme using one or a

combination of at least two of four methods. The institution must continue to identify the factors that influence student performance during the first year of pharmacy school. As a result, the impetus for this research. The findings of this study are hoped to help institutions adjust their admission criteria and intervene in students' academic progress as needed.

STUDY AIM

The study aimed to assess factors that are associated with the performance of students who have enrolled for the first year of pharmacy at the TUT. Specifically, this study was undertaken to determine whether student gender was a significant predictor of student academic performance, even after adjusting for English language, Life science (also called Biology), Mathematics, and Physical science. To achieve this aim, the researchers developed the following null hypothesis:

> *Gender is not significantly associated with student success in the first year of the pharmacy programme at TUT.*

MATERIAL AND METHODS

This cross-sectional quantitative exploratory study (Kirk, 2013; Christensen, Johnson, & Turner, 2015) used data obtained from the Department of Pharmaceutical Sciences at the TUT. The dataset contained information about 166 (100 [60.24%] female, 61 [36.75] male, and 5 [3.01%] unknown/undisclosed) first-year students in the pharmacy programme. The students were categorised into three students' cohorts, namely, students who were in the first year in the academic years 2015 (n = 49), 2016 (n = 65) and 2017 (n = 52). Two (3.08%) and three (5.77%) students from the 2016 and 2017 cohorts, respectively, had an unspecified gender. The analysed dataset excluded repeaters, as they would potentially skew the results. The dataset included information on the participants' matric status, gender, race, nationality, matric subject results, APS, interview scores, potential assessment scores, acceptance scores, and marks earned in the first year of the Bachelor of Pharmacy programme.

Because the cohorts were inherently distinct, the analysis did not use pooled data. The institution blindfolded the data, thus there was no variable in the dataset that might overtly or implicitly identify the participants. The statistical software package used for data analysis was Stata Release 15 (StataCorp, 2017). To predict whether or not a student will be successful in the first year of pharmacy school, hierarchical logistic regression models, both crude and adjusted models, were utilized (Gilliver & Valveny, 2016). Frequencies and percentages were used to present descriptive statistics for all categorical variables. The 95% confidence limit was used in the analysis. Specifically, if the observed p-value was less than 0.05, the (null) hypothesis was not accepted.

RESULTS

Summary Statistics

In the 2015, 2016 and 2017 academic years, the study cohorts comprised 49 (33 [67.35%] female and 16 [32.65%] male), 63 (42 [66.67%] female and 21 [33.33%] male), and 49 (25 [51.02%] female and 24 [48.08%] male) students, respectively. In all academic years, the number of female students was (slightly) higher than the number of male students.

Figure 2 depicts the increase in the proportions of male students during the period of three years, from 32.65% in 2015 to 48.98% in 2017. This meant that the proportion of female students dropped from 67.35% in 2016 to 51.02% in 2017. In other words, in the 2015, 2016 and 2017 academic

years, female students made up 33/49 (67.35 %), 42/63 (66.67%), and 25/49 (51.02%), respectively. Similarly, in the 2015, 2016 and 2017 academic years, there were 16/49 [32.65%], 21/63 [33.33%], and 24/49 [48.98%] male students, respectively. The proportions of male and female students were comparable in 2017

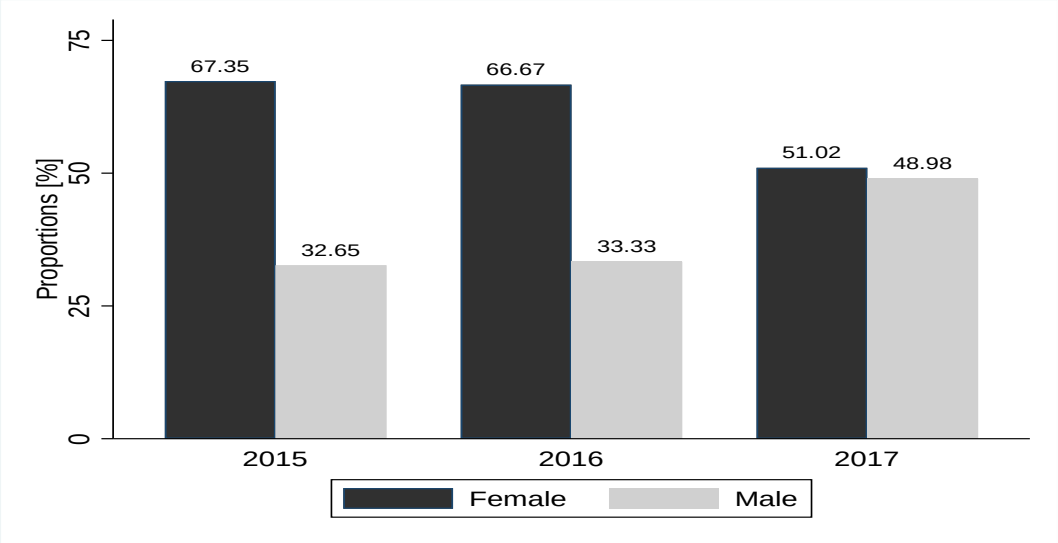

Figure 2. Distribution of gender by the academic year

Inferential Statistics

The likelihood of students' success in 2015, 2016 and 2017 academic years was determined using unadjusted (or crude) and adjusted hierarchical logistic regression models. The odds ratio (OR) was the parameter of interest, which was used to compare the relative odds of the intended outcome (which was a first-year success) based on exposure to the variable (Szumilas, 2010). Table 2 illustrates a possible interpretation of OR.

Table 2: Interpretations of Odds Ratios

Odds ratio (OR)	**Interpretation**
Less than 1 (OR < 1)	Exposure is associated with lower odds of the outcome
Equal 1 (OR = 1)	Exposure does not affect the odds of the outcome
Greater than 1 (OR > 1)	Exposure is associated with higher odds of the outcome

Crude estimates

The results of an unadjusted logistic regression are shown in Table 3. In 2015, 2016, and 2017, male students were 0.333 (p = 0.150, 95% CI: 0.058 – 1.546), 0.533 (p = 0.260, 95% CI: 0.179 – 1.591), and 0.563 (p = 0.324, 95% CI: 0.179 – 1.765) less likely than female students to succeed in their first year of BPharm. Female students had a slight advantage over male students in terms of academic success. In 2015, 2016, and 2017, men's chances of success declined by factors of 0.333, 0.533, and 0.563, respectively, but the differences between the groups were not significant

Table 3: Gender Comparisons - Crude Estimates

Academic Year	Covariate		OR	Std. Err.	*P*>|*z*|	95% Conf. Interval
2015	Gender					
		Female*	1			
		Male	0.333	0.251	0.15	(0.058 to 1.546)
2016	Gender					
		Female*	1			
		Male	0.533	0.297	0.26	(0.179 to 1.591)
2017	Gender					
		Female*	1			
		Male	0.563	0.328	0.324	(0.179 to 1.765)
*baseline category						

Adjusted models.

The language of instruction in the pharmacy programme at TUT is English. The adjusted model given in Table 4, indicated that English, mathematics, physical science, and life science were not significant indicators of whether or not a student will succeed in their first year of pharmacy school. Furthermore, after controlling for English, physical science, mathematics, and life sciences, the model revealed that male students were 0.243 (p = 0.392; 95% CI: 0.009 to 6.215), 0.356 (p = 0.200; 95% CI:0.073 to 1.725), and 0.330 (p = 0.318; 95% CI: 0.037 to 2.912) less likely to succeed than female students in 2015, 2016, and 2017, respectively. In terms of academic success in the first year of Bachelor of Pharmacy programme, female students had a slight advantage over male students.

DISCUSSION AND RECOMMENDATIONS

The objective of the study was to investigate the effect of Grade 12 science-based subjects on student success in a problem- and outcomes-based Bachelor of Pharmacy programme at the TUT.

It remains critical to identify factors that are positively related to pharmacy school academic performance. The result indicated that Grade 12 science-based subjects were not significant predictors of academic performance in the first year of the pharmacy programme at TUT. Particularly, the crude and adjusted estimates indicated no significant difference between male and female students' performances.

The study's findings indicate that female students had a higher chance of success than their male counterparts, according to both crude and adjusted estimates. In other words, TUT's pharmacy programme provides "[more] favourable conditions" for female students' success than it does for male students. There were, however, no statistically significant differences between the gender groups. As a result, males and females had comparable chances of success. The current study findings were consistent with those in Faisal, Shinwari and Hussain (2017), and Ip, Pal, Doroudgar, Bidwal, & Shah-Manek (2018) wherein male and female students performed insignificantly in the pharmacy programme.

Table 4: Gender Comparisons - Adjusted Models

Academic Year	Covariate	OR	Std. Err.	P > |z|	95% Conf. Interval
2015	Gender				
	Female*	1			
	Male	0.243	0.402	0.392	(0.009 to 6.215)
	English	0.472	0.835	0.671	(0.015 to 15.126)
	Mathematics	1.989	2.153	0.525	(0.239 to 16.590)
	Physical Science	0.881	0.910	0.903	(0.116 to 6.675)
	Life Sciences	0.367	0.424	0.386	(0.038 to 3.537)
2016	Gender				
	Female*	1			
	Male	0.356	0.287	0.200	(0.073 to 1.725)
	English	0.514	0.266	0.199	(0.186 to 1.418)
	Mathematics	0.643	0.360	0.430	(0.215 to 1.924)
	Physical Science	1.688	0.942	0.349	(0.565 to 5.039)
	Life Sciences	1.003	0.389	0.994	(0.469 to 2.146)
2017	Gender				
	Female*	1			
	Male	0.330	0.367	0.318	(0.037 to 2.912)
	English	0.849	0.611	0.820	(0.207 to 3.483)
	Mathematics	0.755	0.524	0.685	(0.193 to 2.945)
	Physical Science	0.711	0.563	0.667	(0.150 to 3.358)
	Life Sciences	3.045	2.541	0.182	(0.594 to 15.626)

*baseline category

Table 5 presents some of the factors that are deemed predictors of students' performances in the pharmacy programmes. It indicates that absenteeism, student background, demographic factors, psychological factors, socioeconomic factors and the ability to decode meaning from the symbolic language used in pharmacy programmes, and the results of the assessment tests used to select suitable qualifying students are vital. This paper suggests that the use of structural equation modelling (SEM) together with hierarchical regression models adjusting for the given significant factors in Table 5 may explain the total variation in the overall students' performances in the pharmacy programmes. In particular, the adjusted model may produce the plausible model to predict students' performance in pharmacy programme As the responsibilities of pharmacy practice expand beyond filling prescriptions to providing pharmaceutical care, universities and schools of health sciences must identify pre-admission factors related to applicants' ability to provide patient-care services in a multidisciplinary setting. Therefore, this finding has serious implications for the admission policies and strategies of universities, especially pharmacy programmes.

Table 5: predictors of student performance

Class Attendance	
Student orientation (background)	
	Location of the school
	School type
	Logical reasoning skills
	environment
	Pre-University computational knowledge
	English competency
Demographic	
	Gender
	Age
Psychological	
	Social support
	Peers Support
Socio-economic	
	Parents' type of work
	Parents' educational statuses
	Financial support
Symbolic language	
	Mathematics statement
	Organic chemistry
	Physics
Pharmacy curriculum outcomes assessment (PCOA)	
Pharmacy college assessment test (PCAT)	

The performance of students is affected by myriad factors, including a student's preferred learning style; the availability of finances; students' living conditions; socialisation factors, time management and dedication to studies, which includes absenteeism, all, play a role. Arguably, institutional intervention strategies, which may assist students to achieve academic success, also have a positive contributing role. Of course, once a student is selected, then the institution also needs to consider how to support a student to overcome the effects of these "numerous additional factors".

Policies governing educational assessment are constantly evolving around the world. According to the findings of this study, Grade 12 results should not be used as the sole predictors of student performance in the first year of a pharmacy programme. To determine the level of preparedness of first-year entrants, a carefully developed diagnostic assessment tool, along with matriculation results, should be developed so that appropriate support can be developed for them.

Future research could validate the efficacy of the pharmacy programme using data generated by a carefully developed diagnostic assessment tool. In other words, this study recommended that a study be conducted to confirm the current results using a dataset that includes other factors mentioned in other studies.

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DECLARATION OF INTEREST

The authors declare that they have no financial relationship(s) that may have inappropriately influenced them in writing this article.

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Factors Affecting the Implementation of Four Selected Areas of the Zimbabwe Infant Competence-Based Curriculum in Shamva: Educators' Experiences.

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ABSTRACT

This study explored the experiences of infant teachers (ECD A-Grade 2) in the teaching of the four selected areas of the New Curriculum namely: Mass Displays, Visual and Performing Arts, Physical Education and Information Communication and Technology. The New Curriculum, which is competence-based, was introduced in January 2017. The study was guided by the self-efficacy theory. A qualitative approach was used in this case study. Twenty participants were purposively selected from 3 primary schools and one teachers' college in Shamva District of Mashonaland Central Province in Zimbabwe. Data generation was done through face-to-face interviews, semi-structured questionnaires which yielded open answers, focus group discussions and classroom observations. The data gathered were analysed using the constant comparative method for thematic coding in line with the research questions. The major findings were that teachers felt that they were not competent enough to teach the selected areas of the curriculum and that there was high teacher-pupil ratio, lack of support from parents, inadequate resources and failure to use the mother language. This study recommends that the Ministry of Primary and Secondary Education (MoPSE) should address the needs of teachers through professional development so as to ensure effective implementation of the selected areas of the curriculum at infant level.

Keywords: Infant teachers, competence-based curriculum, Information Communication and Technology, Mass Displays, Visual and Performing Arts, Physical Education

INTRODUCTION

The recent curriculum came against the background of lack of full implementation of the Nziramasanga (1999) report and the continued problems it was supposed to have resolved if it had been fully employed (Nziramasanga, 2018). The New Curriculum is premised on the development of competences (knowledge, skills and attitudes) in each learner as well as the promotion of national identity including inculcating values of Unhu/Ubuntu/Vumunhu (MoPSE, 2017, p.2). Accordingly, it may be mandatory to lay down a proper foundation at Early Childhood Development (infant) level, so that learners get exposure to the said competences during early years of schooling.

The New Curriculum rationalizes the infant curriculum into seven learning areas. This was achieved by identifying principal learning areas into which several cross-cutting themes were embedded. According to the Secretary's Circular Number 2 of 2017 p. 3, the areas for the infant school (ECD to Grade 2) in the New Curriculum are: Languages; Visual and Performing Arts;

Physical Education; Mass Displays; Mathematics and Science; Heritage Studies (Social Studies) and Information and Communication Technology (ICT).

The focus of this study was on the experiences of Early Childhood Development (infant) teachers (ECD A up to Grade 2) in implementing four selected areas of the Zimbabwe New Curriculum namely: Physical Education, Mass Displays, Visual and Performing Arts (VPA), and Information Communication and Technology (ICT).

Physical Education and Mass Displays

Related areas in the New Curriculum are Physical Education and Mass Displays (hereafter PEMD). The introduction of mass displays and sports has several benefits to the child's future, well-being and development. Turner et al. (2017) state that there is overwhelming evidence that children who are involved in sporting activities are healthy and better learners. PEMD lies in the acquisition and accumulation of various personal, social and socio-moral skills which, in turn, can act as social capital to enable young people to function successfully and acceptably in the society in a variety of situations (Bailey, 2005; Ngwenya, 2019). Although primary school teachers may have knowledge of Physical Education from their training, the element of Mass Displays is foreign and totally new to the majority of teachers who are expected to implement it. PEMD is an avenue for engaging school-aged children in developmentally appropriate physical activities designed for learners to develop their fitness, gross motor skills and health. In the context of this study, inadequate knowledge and skills to deliver subject content, particularly Mass Displays, may contribute to poor methodology as well as low confidence. Darling-Hammond, Hyler and Gardner (2017) assert that Professional Development (PD) increases teachers' knowledge and skills and empower them to modify their teaching in ways that benefit learners. Findings yielded by Abacioglu, Fischer and Volman's (2022) study indicated that teachers who received PD during in-service education had more positive attitudes towards multicultural practices compared to those teachers who did not undertake PD. Accordingly, educators in PEMD are likely to benefit when they engage in PD.

Visual and Performing Arts

In the Zimbabwe New Curriculum, various subjects which require aspects of creativity were fused and they make up the Visual and Performing Arts (VPA) curriculum. Concepts which were done in Music and Art were integrated to form the VPA, as one curriculum area. Alter, Hays and Hara (2014) affirm that Arts-based processes allow learners to express their knowledge, ideas and feelings in ways that do not necessarily involve words. Teachers may not be familiar with VPA where learners should be empowered to develop their cultural and social values (Ngwenya, 2019). Research done in Australia by Alter, Hays and Hara (2014), on challenges in implementing the Arts education curriculum, revealed that one of the challenges in teaching music was lack of confidence, which subsequently caused teacher stress. Ballantyne and Zhukov (2017) conducted a study in Australia and concluded that continuing professional development is critical in assisting early-career teachers in acquiring new skills and teaching strategies. In a related study conducted by Mujuru (2019) in the Shurugwi District of Zimbabwe, findings revealed that primary school teachers were not effectively trained to teach new learning areas since the duration for in-service training was too short and those who

conducted training did not fully understand the nature of the learning areas. Therefore, in the context of our study, a strong background in the teaching of Visual and Performing Arts is needed by all teachers so as to boost their confidence.

Information Communication and Technology

ICT is another curriculum area which was infused in the ECD (infant) New Curriculum. ICT is viewed as an important curriculum area which may mean an acceleration of economic and social development and greater inclusion of isolated, particularly rural populations, into the mainstream society (Kabanda, 2012). Ngwenya (2019) believes that the strong technological aspect incorporated into the new competence-based curriculum assists learners to develop skills which are necessary in linking the school to industry, thereby enhancing economic development. In Zimbabwe, ICT in education is not a very widespread phenomenon, especially considering rural settings where most schools are not connected to electrical power supply and where some schools hardly have any buildings to house the computers (Mujuru, 2019).

Shamva District is in remote areas of Mashonaland Central and most of the schools in this district are farm schools which were built by former white settlers, while others are former mine schools. Some of the major challenges that schools in Zimbabwe in general are facing are largely associated with the prohibitive costs of purchase and maintenance of computers in the schools, as well as shortage of qualified personnel to operate the ICT gadgets (Mandoga, Matswetu & Mhishi, 2013; Ngwenya, 2019). Research conducted by Tondeur et al. (2016), based on comparison across four cases involving Sri Lankan, Israeli, Australian and Kenyan schools, concluded that provision of resources, coupled with teacher professional development, enhances application of ICT in education. In a related study in Tanzania, Charles and Mkulu (2020) established that inadequate resources contributed towards overcrowded classrooms in public primary schools. As a result, academic performance was affected since learners could not focus on their schoolwork.

THEORETICAL FRAMEWORK

This study was guided by the self-efficacy theory proposed by Bandura (Adeyemo & Onongha, 2010; Hussein & Khan, 2022). The self-efficacy theory explains motivated behaviour in terms of conscious cognitive processes which involve the capability to anticipate goals and rewards, and use "judgement, evaluation, and decision making rather than unconscious biological or mechanical processes" (Borich & Tombari, 1997, p. 215). This theory was considered relevant because teachers must develop a feeling of self-efficacy, which strengthens the feeling of self-confidence to enable them to adopt and implement new teaching strategies (Bitan-Friedlander et al., 2004; Matoti, Janqueira & Odora, 2011; Kalinowski, Gronostaj & Vock, 2019).

Adeyemo and Onongha (2010) express the view that self-efficacy assists in two major ways. The first is that self-efficacy beliefs influence task choice. The second is that self-efficacy determines effort persistence, resilience and achievement. Accordingly, the trend in self-efficacy is that people take joy in and pursue activities which they believe they have the requisite skills (Bhatt, 2007). Thus, in the context of this study, those infant teachers who believe that they do not have the ability to effectively teach VPA, PE, ICT and Mass Displays are likely to ignore effecting the

changes under the prevailing circumstances at their respective schools.

Dale Schunk (1991; 1995), a leading researcher on self-efficacy, identifies sources of self-efficacy beliefs which are relevant to this study, namely, mastery experience, vicarious experience and verbal persuasion (Borich & Tombari, 1997; Adeyemo & Onongha, 2010; Matoti et al., 2011). The first antecedent of self-efficacy judgement is mastery experience, also known as past experience of success or failure. Pajares (2002 cited in Matoti et al., 2011) claims that mastery experience is the way a person interprets the results of previous performance. Thus, those teachers who experienced success in previous performance will have higher self-efficacy than those who failed. Therefore, the implication for this study is that if teachers have to effectively teach VPA, PE, ICT and Mass Displays as new areas in the infant curriculum, they need to develop capacity for successful achievement through training in order to be empowered to handle implementation (Pella, 2015; Serin, 2017; Abdulkerim, Nasır, Parkinson et al., 2022).

The second source of self-efficacy beliefs is that of social persuasion or encouragement. Individuals can create and develop self-efficacy beliefs by being encouraged by word of mouth from others. It can, thus, be concluded that, those infant teachers who may believe that they do not have adequate skills to handle the new areas, can often be persuaded that they are able to succeed by a convincing and inspiring significant other. According to Sergiovanni (2005), such encouragement can be achieved when teachers engage in collaboration and collegiality as a professional community (Tondeur et al., 2016).

The third source is vicarious experience of observing others perform tasks, also referred to as modelling effects. When people are uncertain about their own capabilities or when they have limited prior experience, they become more sensitive to it (Mwamwenda, 2004; Matoti et al., 2011; Ballantyne & Zhukov, 2017; Hussein & Khan, 2022). When people observe failure by peers or hear about the difficulty of a task, then their estimates of self-efficacy are lowered. In the context of this study, modelling by way of demonstration lessons by fellow teachers may make the teaching of VPA, PE, ICT and Mass Displays appear easy, thereby enhancing teacher self-efficacy. It is, therefore, pertinent to assess what educators value, the information and beliefs that they have, as well as their motivation and commitment to implement the New Curriculum areas at infant level.

STATEMENT OF THE PROBLEM

Implementation of the New Curriculum was done in phases in primary school education. Though most of these affected grades are being manned by qualified teachers who in some cases possess high qualifications, these teachers were not exposed to these curriculum areas before. Some of the changes in the New Curriculum are teaching methods, assessment criteria and learning areas. Research on challenges faced by primary school teachers on implementing the New Curriculum was done in Zimbabwe (Mujuru, 2019; Ngwenya, 2019). However, not much research has been documented on the implementation of the new competence-based curriculum at infant level in a rural setup. The curriculum is to be implemented over a period of six years with continuous evaluation, beginning January 2017. Our study was conducted when implementation of this New Curriculum was in its fifth year. Hence, it was deemed necessary to assess the experiences of educators in teaching the four selected areas so that the recommendations made would be

considered when implementing other phases.

RESEARCH QUESTIONS

- What competences do teachers have which enable them to effectively teach the four selected areas of the competence-based curriculum at infant level?
- What challenges are experienced by infant teachers in implementing the New Curriculum in respect of ICT, Mass Displays, Visual and Performing Arts and Physical Education?
- Which initiatives are needed by educators to enhance effective teaching of the four selected areas of the New Curriculum?

RESEARCH METHODOLOGY

The study employed a case study research design and a qualitative approach. The qualitative approach was selected in order to provide a close fit between the research methods and the research questions being asked (Punch & Oancea, 2014).

Twenty (20) participants were purposively selected, and the sample consisted of6 ECD (infant) teachers, 3 school heads, 3 TICs and 8 ECD student teachers who had completed their teaching practice and were on their final residential phase at one college in Shamva. Student teachers were regarded as suitable in describing their mentors' experiences in teaching the New Curriculum since they had been attached to them for 3 terms. Only experienced infant teachers were selected as they were in a position to provide rich data pertaining to their experiences as infant teachers. All the school heads and the TICs for the three sampled schools were involved in the study as they were the supervisors at infant school level.

Data for this research were collected using a semi-structured questionnaire, an interview guide, focus group discussion and observation. The researchers obtained raw data from naturally occurring situations through observation (Cohen, Manion & Morrison, 2011). The researchers observed the learning environment, facilities available and some assessment records which were introduced as a result of the New Curriculum. In addition, lesson observation on the teaching of VPA, ICT, PE and Mass Displays was done, with the main focus being on the methods used and the use of mother language across the curriculum as required by the New Curriculum guidelines.

6 teachers and 3 school heads responded to a semi-structured questionnaire which allowed participants to explain and qualify their responses (Cohen et al., 2011). The interviews were held with 3 TICs at their respective schools, while student teachers participated in focus group discussions. Each interview lasted approximately one hour, and the use of a semi-structured interview guide enabled participants to give their own views on the experiences of ECD teachers in implementing VPA, ICT, PE and Mass Displays as areas of the new competence-based curriculum.

The constant comparative method (Cohen et al., 2011) was used to analyse data collected from the open-ended questionnaire, face-to-face interviews, focus group discussions and observation check lists. Reliability was guaranteed through triangulation since information was gathered through the use of multiple tools and multiple sources (Gray, 2009).

Permission to conduct this research in Shamva primary schools was granted by the Head Office (MoPSE) and subsequently by the Provincial Office and the District Office of Education. Participants were

informed about the ultimate purpose of the research prior to the interviews, observation and the focus group discussions. For confidentiality, pseudonyms were used for the participants and names of their schools.

FINDINGS

The main aim of this study was to explore the experiences of infant teachers (ECD A to Grade 2) in implementing the new competence-based curriculum in four selected areas of VPA, PE, Mass Displays and ICT. After reading responses from the semi-structured questionnaires and transcriptions from interviews and focus group discussions several times, data were categorised into themes which were developed from research questions that guided the participants' accounts, namely: teacher competences, challenges in teaching ICT, PE, VPA and Mass Displays, use of the mother language, and possible initiatives that teachers feel are needed to enhance effective implementation of the competence-based curriculum at infant school level.

Teacher Competences

Under this theme, participants indicated that they did not undergo meaningful training to empower them to gain confidence in teaching the four selected areas of the competence-based curriculum at infant level. All the participants indicated that they were trained before the New Curriculum was introduced. The following excerpts represent what was said by many of the four groups of participants:

> Teachers attended the workshops on the New Curriculum but most have no relevant skills to teach ICT and Mass Displays. Some are buying schemes for use in their classes and these schemes have shallow information. In ICT teachers either ignore the subject or only do theory as they do not have skills. In most cases they leave these subjects untaught. This is because they run short of content as they try to teach these subjects. (Discussant 6, FDG)

> I cannot say I am adequately trained. The term adequate is not the correct term for explaining my position. Though I can teach some concepts, I am not adequately trained. I lack confidence in teaching a number of concepts. As for other teachers and heads, they think that the New Curriculum has new information, new content and concepts which they are not knowledgeable of. (TIC, School C)

> The biggest challenge is that we do not teach these learning areas because we also do not know what to teach. Teachers and school heads were not given adequate training on how to teach the New Curriculum. The concepts are new and we were not trained at college on these new concepts. (Teacher, School B)

> Teachers do not have knowledge and skills of teaching the Mass Display learning area since most of them didn't encounter it both at school and college. In VPA, for example, teachers are failing to teach theatre and dance. (Head, School C)

The above vignettes show that participants who were school heads, TICs and infant teachers had little knowledge on the teaching of ICT, VPA, PE and Mass Displays. From the classroom observations, it was noted that there were displays in the form of charts, models, children's work and mobiles but very few were related to the teaching of VPA, ICT, PE and Mass Displays. It was also observed that some of the displays (toy laptops) were new and still sealed, showing that they were not being

used for the benefit the learners, an indication that teachers did not have the knowledge. Basing on the information presented, it can be concluded that teachers do not have the needed competences which enable them to effectively teach the four selected areas of the competence-based curriculum of the infant school.

Challenges in Teaching ICT, PE, VPA, Mass Displays

The four selected areas of the new competence-based curriculum had many factors which appeared to hinder their effective implementation in the schools under study. The main challenges identified by study participants include teacher-learner ratio, inadequate resources, lack of parental involvement and barriers in the use of the mother language when teaching.

Teacher-learner Ratio

One factor which was raised as negatively affecting the implementation of the New Curriculum in the selected areas was the teacher-learner ratio. The recommended teacher-to-learner ratio in these areas is 1:30. The concern was expressed by the head of School C, who indicated that there was high teacher-learner ratio at that school. In their questionnaire responses, two teachers corroborated this sentiment when they indicated that one of the classes had 56 learners while the other had 65. At these schools, researchers observed that teachers found it difficult to move around supervising learners as the space was not adequate due to the high number of learners.

Insufficient Resources

Many of the participants indicated that they were concerned about shortage of resources which are critical for effective implementation of the new competence-based curriculum. These sentiments were expressed as follows:

> Teachers lack confidence in teaching VPA, ICT, PE and Mass Displays as a result of shortage of resources. (Discussant 2, FDG)

> Positive attitudes were being shown but lack of resources causes stress during implementation. Teachers are failing to deliver as some of these subjects are new and they need resource backup. (Head, School B)

> There are not enough resources for effective implementation of the New Curriculum. We just work with what is on the ground. (Teacher, School A)

Participants believed that addressing the issue of resources would greatly improve the effectiveness of the new curriculum.

Parental Involvement

Results show that the parents were not fully involved in the learning of their children. Community involvement in the infant school was seen by all educators as having a crucial role in the teaching of the four selected areas of the competence-based curriculum.

> We need resources even in form of cash to purchase ICT tools, and also to buy equipment that we need in VPA and PE. We also need community artefacts and labour from parents so as to carry out projects at our school. (TIC, School A)

> Parents should be seen to be providing very big support in terms of resources, and supplying equipment in the learning centres. They should contribute to the activities that support the learning of their children such as making toys

for their children. (Teacher, School C)

Most participants were concerned about the support of parents which was lacking in the learning of their children. Forms of support were identified and teachers felt that they needed material resources and labour. The researchers observed that the teaching and learning resources in the selected areas were inadequate. Some learners were found to be without resources at one of the schools. The number of dolls and balls at the play areas observed in the play areas did not correspond to the number of learners, despite the fact that all learners were given newsletters about the school's requirements to take home to their parents. This significantly hampered the New Curriculum's effective implementation in the targeted areas.

Mother Tongue Usage

The majority of the participants were of the view that the use of the mother language when teaching ICT, PE, VPA, and Mass Displays is critical in helping learners to understand concepts. This view was presented by some of the participants who stated that:

> I strongly agree with the use of mother language because at this stage, learners understand best when they are taught in the mother language. The use of mother language assists learners in teaching ECD children to understand the concept taught much easier. (Teacher, School A)

> The use of mother language is good for the young children as it enables them to understand concepts especially in VPA and Mass Displays. (Discussant 4, FDG)

> Yes, mother language is quite good and I highly recommend it since most pupils understand it much easier but I also suggest that pupils should be taught in both languages so that they learn the second language which is English. (TIC, School B)

However, some participants said they experienced some challenges as they used the mother tongue in implementing the new competence-based curriculum in the four selected areas. The views of these participants were expressed as follows:

> Though children can imitate and copy what is being done by the teacher, teachers are having problems in translating the content in the syllabi for the four selected curriculum areas since they are written in English. There are other words that do not exist in vernacular language because some of these materials are not part of our culture. For example, how do you use the mother language where it says 'choreographed'? (Teacher, School B)

> When conducting lesson in VPA and ICT we have challenges in finding words to replace. We tend to use the international language English like what we were doing in the old curriculum in science. Therefore, children should be taught using both languages to suit the international world. I personally believe in catching them young hence children should be taught in English even at ECD level. (TIC, School C)

> While it may assist learners to learn fast, it however makes them have shortcomings in concepts that

> are to be tested later as they use the official language which is English. The teachers should not wait for time to lapse. Learners should be taught using L2 since it is the medium of instruction used in most subjects. (Head, School A)

The perceptions of these participants showed that while the use of mother language in the four selected areas is appreciated, effective implementation of the mother tongue policy was not possible due to challenges of translation as well as English hegemony. School heads and TICs mainly appeared to be concerned about the performance of learners during tests, hence they preferred the use of English right from ECD level.

Proposed Initiatives Needed to Enhance Effective Implementation of the New Curriculum

Participants suggested that [in order] for effective implementation of the New Curriculum in the selected areas to be possible, teachers should be empowered primarily through staff development.

The sentiments were expressed thus:

> I believe a lot should be done. It starts with the teacher training. To effectively implement, teachers should undergo training on these four selected areas. I recommend in-service training for teachers so that they receive adequate knowledge. The content in the New Curriculum sometimes you feel that it does not really suit the level of the learners. (TIC, School B)

> There are no textbooks and there is shortage of equipment. Teachers should be given material resources like text books, ICT gadgets and incentives. (Head, School A)

> If a policy has been put in place the government should respect that policy through the ministry by considering the teacher-learner ratio of 1: 25. (Head, School C)

It can be concluded that in-service training was the major aspect needed since there is new content in the selected areas of the New Curriculum. The other intervention strategies suggested include mobilisation of resources and maintaining the Ministry's policy of the teacher-pupil ratio.

DISCUSSION

The role and influence of the teacher in the process of new curriculum implementation is indisputable (Abacioglu, Fischer & Volman, 2022). Teacher participants in this study were found to be struggling to teach the four selected areas, implying that they did not have the required competences and confidence to implement the competence-based curriculum. Mujuru's (2019) study revealed that there were critical shortages in trained personnel to teach new learning areas such as ICTs, VPAs and Mass Displays in primary schools in Shurugwi District, in the Midlands Province of Zimbabwe. The student teachers who were participants in our study and were supposed to benefit from qualified and experienced infant teachers, observed that their mentors appeared not to have requisite skills and content to demonstrate the teaching of the four areas of the competence-based curriculum. It follows that at all the schools where our research was conducted, most of the objectives in VPA, ICT, PE and Mass Displays were not met. The possible explanation is that in line with the self-efficacy theory, teachers may not have experienced lesson demonstrations in order to observe others performing tasks so as to

be encouraged, convinced and inspired and hence experience success (Gavora, 2010; Adeyemo & Onongha, 2010; Matoti et al., 2011; Serin, 2017; Hussein & Khan, 2022).

Educators in our study did not have the needed competences which are necessary to allow them to effectively teach the four selected areas of the competence-based curriculum of the infant school. Research on implementation of any new competence-based curriculum found that professional development is a key component to allow teachers to continuously improve on how to implement a quality educational system (Jallow, 2011; Tambwe, 2017; Zindi, 2018; Darling-Hammond et al., 2017; Abdulkerim, Nasır, Parkinson et al., 2022). Tondeur et al. (2016) established that Teacher Professional Development is critical in educational change, especially in the application of technology to enhance learning. Teachers are active learners who need to continuously acquire knowledge through participating in intense and frequent in-service programmes, attending conferences and organising meetings where they can exchange ideas with colleagues pertaining to teaching and learning (Darling-Hammond, 2017; Serin, 2017; Abacioglu, Fischer & Volman, 2022). Such PD is essential in developing educators' self-efficacy so that they may take joy in pursuing activities which they believe they have the essential skills. Thus, in the context of this study, those infant teachers who believe that they do not have the ability to effectively teach VPA, PE, ICT and Mass Displays are likely to ignore effecting the changes under the prevailing circumstances at their respective schools.

The use of indigenous languages in the teaching and learning of ICT, Mass Displays, PE and Visual and Performing Arts was viewed as a challenge. The issue of using the mother language was viewed differently by school heads and TICs on one hand, and the infant teachers and student teachers on the other hand. Whilst infant teachers advocated for use of the mother tongue, school administrators recommended the use of the second language as they were concerned about examinations which are written in English. It was indicated, in our study, that there was limited vocabulary to substitute the English words in implementing the language policy in the four selected areas. The Secretary's Circular Number 2 of 2017 clearly states that, the medium of instruction in the infant school shall be an indigenous language which is commonly used or spoken in a particular area as outlined in the constitution of Zimbabwe. Despite the significance of using the mother tongue in education, some studies conducted in other African countries (Agbedo, Krisagbedo & Eze, 2012; Mokibelo, 2018; Mandillah, 2019), as well as in Zimbabwe (Ndamba & van Wyk, 2018; Ngwenya, 2019) produced findings which indicate that there are factors which hinder effective use of indigenous languages in education in the primary school context. Therefore, self-efficacy can be enhanced when educators collaborate and engage in PD which is targeted towards development of positive attitudes on the use of indigenous languages (Tondeur et al., 2016).

Adequate resources are a critical factor on the success of a competence-based programme (Turner et al., 2017). The findings of this study indicate that lack of resources hindered the effective implementation of the new competence-based curriculum as infant learners were not exposed to functioning computers where they are supposed to format, draw and change colour of text. It was observed that very few materials were found in learning areas as compared with the numbers in the classes. Similar findings were yielded by Mujuru (2019), whose study exposed that

inadequate infrastructure hindered effective implementation of the New Curriculum in the Shurugwi District of Zimbabwe. The possible explanation for inadequate resources may be that parents may not be aware of the demands of the schools (Emmanuel & Asah, 2019). Parents are the children's custodians from birth, and it is their duty to make sure that the child is well protected, is healthy and attains quality education (Ngwenya & Pretorius, 2013; Ngwenya, 2019). Ngwenya and Pretorius (2013) observed that the provision of educational materials can only be made possible if parents' representatives know about the legal statutes which empower them to be meaningfully involved (Tambwe, 2017). For example, in the VPA area, the School Development Committee is expected to source televisions, computers, tape recorders, and musical instruments to use when conducting theatre lessons, building halls for drama and dance exercises, laboratories for experiments and artwork, and sports facilities for various sporting activities at infant school level.

Teacher-learner ratios in schools sampled for this study were very high, hence affecting individual tutoring in the four selected areas of PE, ICT, Mass Displays and VPA. The ratios in the classroom were found to greatly affect implementation of the competence-based curriculum in the Zimbabwean context due to inadequate resources (Ngwenya, 2019). Similar findings were yielded in Nigeria (Ikediashi & Amaechi, 2012) where the teacher-learner ratio was as high as 50 or higher and it was observed that in such a scenario, teachers may not perform optimally. In Kenya, Mwirigi and Muthaa (2015) found that classes which were overcrowded had learners with destructive behaviour who were found not paying attention to the level of intensity required. Overcrowded classrooms tend to be teacher-centred where learning is passive, with the result that learners may lose motivation, whereas lower teacher-learner ratios result in higher-quality education (Cortes, Moussa & Weinstein, 2012; Ikediaskhi & Amaechi, 2012; Chingos, 2013; Boyi, 2014; Marais, 2016; Charles & Mkulu, 2020). In view of the large numbers of learners at infant school level in Zimbabwe, infant schoolteachers in Shamva may not be able to create conducive environments as per demands of the new competence-based curriculum.

RECOMMENDATIONS

Teachers need to be re-trained so that they are confident enough when implementing the competence-based curriculum. This professional development can help overcome shortcomings that may have been part of teachers' pre-service education and keep teachers abreast of new knowledge and practices in the field.

In line with the self-efficacy theory, at individual school level teachers should collaborate with each other in the teaching of the four selected areas.

For the learners to acquire the needed materials, the MoPSE should come up with programmes where partners may offer loans to schools so that they are given ICT tools and other relevant gadgets which they can pay for later.

School heads should always campaign for strong parental involvement so that the implementation of the four selected areas of the curriculum is effective.

The MoPSE should increase the number of teachers in schools in order to cater for teacher-learner ratios which appear to hinder effective teaching of VPA, PE, ICT and Mass Displays.

CONCLUSION

The focus of this research was on the experiences of educators on the teaching of VPA, ICT, PE and Mass Displays at infant school level in Shamva schools. Implementation failure may be attributed to ECD (infant) teachers' lack of confidence in teaching, high teacher-learner ratio, challenges in using the mother tongue as the language of education, scarce resources, as well as insufficient support from parents. Staff development was viewed as the most appropriate way of empowering infant teachers to embrace the new areas of the competence-based curriculum whose implementation started in 2017.

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Business Studies Teachers' Utilization of WhatsApp For Instructional Purposes In Selected Schools In South Africa

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ABSTRACT

Social media continues to infiltrate different sectors, including the education sector. As a result, teachers employ various social media tools, such as WhatsApp in their instructional practices. This study investigated the integration of WhatsApp by Business Studies teachers from selected rural-based schools in South Africa. This qualitative study is located within interpretive paradigm. Diffusion of Innovation Theory was used as the theoretical lens of the study. Purposive sampling was adopted to select three Business Studies teachers to participate in the study. Semi-structured interviews were used to collect data, and the data was analyzed thematically. The study found that Business Studies teachers utilize WhatsApp in their instructional practices. However, not all learners have full access to smartphones. The study also revealed that teachers believe that using WhatsApp contributes to learners' learning. The study recommended that the utilization of WhatsApp in Business Studies classrooms be strengthened to enhance learners' learning. The study concluded that Business Studies teachers embrace WhatsApp in their instructional practices as a tool to enhance their teaching. Therefore, the study recommends that the Department of Basic Education formulate a framework that would guide teachers when integrating social media into their instructional practices.

Keywords: Business Studies, Teacher, WhatsApp, Rural-based, Teaching, Learning.

1 INTRODUCTION

Social media continues to infiltrate different sectors and aspects of life. Social media sites such as WhatsApp, Facebook, Twitter, and Instagram enable people to collaborate, create communities and participate in different conversations and discussions (Mazana, 2018). The infiltration of social media is not limited to our daily lives, but it continuously changes the way knowledge is digested and taught in classrooms by providing teachers and learners with new avenues for communication, curriculum delivery and learning (Van Doorn & Eklund, 2013). Nowadays, teachers from both affluent and low-resourced schools face the challenge of utilizing technology resources, including social media, to enrich learners' learning. Most under-resourced schools are in rural areas, and they lack sophisticated educational technologies that can be used to improve learners' learning (Mahaye, 2020). The easily accessible and affordable technological resource for both teachers and learners in rural-based schools is WhatsApp. WhatsApp enables teachers to easily share teaching and learning materials (Budianto & Arifani, 2021). The utilization of WhatsApp in rural-based schools for instructional purposes was also heightened by the outbreak of COVID-19 (Nsabayezu et al., 2020). Currently, most teachers in rural-based schools, including Business Studies teachers, continue to use WhatsApp to support their pedagogical practices (Pokhrel & Chhetri, 2021).

2 RESEARCH QUESTIONS

- How do Business Studies teachers utilize WhatsApp in their instructional practices in rural-based secondary schools?
- What challenges do Business Studies teachers encounter when using WhatsApp for instructional purposes?
- How does the integration of WhatsApp enhance teachers' instructional practices?

3 PROBLEM STATEMENT

Scholars regard the integration of ICT in teaching and learning process as the vehicle for quality education (Makgato & Awolisi, 2019; Tariq Zafari, 2019). In other words, meaningful ICT integration in teaching and learning has the potential to ensure that learners access quality education. Despite this critical role of ICT tools in teaching and learning, rural-based schools in South Africa are still struggling to fully integrate ICT tools for instructional purposes. This is due to a lack of adequate devices such as computers, a lack of ICT infrastructure such as computer laboratories, poor connectivity, and the high cost of installing ICT tools in the classrooms (Alice et al., 2016; Mathevula & Uwizeyimana, 2014). This results in a digital divide between schools in affluent areas and those in rural areas because the level of ICT integration is not the same (Soomro et al., 2020). To mitigate the low level of ICT integration in rural-based schools, some teachers resort to the utilization of WhatsApp to enhance learners' learning experiences. Although some teachers do not fully embrace the utilization of WhatsApp for instructional purposes, studies suggest that WhatsApp plays an important role in facilitating learners' learning (Vadachalam & Chimbo, 2017). Therefore, researchers deemed it necessary to investigate how Business Studies teachers utilize WhatsApp to enhance the teaching and learning process in rural-based schools.

4 LITERATURE REVIEW

Previously, WhatsApp has been seen as a mere social network platform mainly used for socialization (Nsabayezu et al., 2020). However, in recent years teachers have adopted it to strengthen their teaching practices. This is because WhatsApp empowers learners to connect with their teachers and peers by sharing audio, videos, text messages and documents (La Hanisi et al., 2018). WhatsApp enables teachers to maintain interactions with their learners even beyond school hours. Nsabayezu et al. (2020) assert that WhatsApp plays a vital role in promoting a noble learner-teacher relationship and a good virtual learning environment. For subjects such as Business Studies that necessitate ongoing collaboration between the teacher and learners, WhatsApp may provide an appropriate platform for discussions. Business Studies teachers can create a WhatsApp group to conduct discussions. For instance, as Business Studies teachers prepare for the next lesson, they can share key concepts and questions to learners via the subject's WhatsApp group, allowing each learner to go through the concepts and questions before class time. The class time can be used for active discussions and interactive activities in the classroom while the teacher facilitates learners' knowledge sharing and construction (Panopto, 2021).

Furthermore, the integration of WhatsApp in teaching and learning encourages teachers to adopt learner-centred teaching methods, where learners are at the centre of their own learning. Therefore, it encourages active learners' involvement (Mistar & Embi, 2016). This suggests that integrating WhatsApp in education enables learners to be fully engaged in their learning activities. If WhatsApp is integrated, learning may happen at learners' pace, and learners can

be able to decide how and what to learn (Khan & Kumar, 2022). For instance, Business Studies teachers can disseminate content to be learned in the classroom using the subject's WhatsApp group. All learners can have access to the content and independently learn the content without teachers' intervention. WhatsApp group enables all learners to participate in a discussion and provide or receive immediate response to or from their peers (Zarei, 2020). Business Studies learners can participate in a discussion over a WhatsApp group and discuss the content provided to them by the teacher. In the following day, during Business Studies session, learners can make oral presentations based on the content learned over a WhatsApp group. The teachers' role will be to facilitate learning as learners do oral presentations.

Conversely, some teachers are still skeptical of integrating WhatsApp into their classrooms. Those teachers believe that WhatsApp interferes with study time (Irfan & Dhimmar, 2019). The researchers argue that when teachers integrate WhatsApp, they should guide learners on the utilization of WhatsApp during teaching and learning. For instance, the teacher can develop the rules of a subject's WhatsApp group and emphasize to learners the role that WhatsApp can play in advancing and enriching their learning experiences. Nevertheless, guiding learners on the utilization of WhatsApp for learning can be difficult for some teachers because they might be unaware of the learning activities that can be supported by the integration of WhatsApp (Agustrianita, 2021). Furthermore, other teachers may have a negative perception towards using WhatsApp in their classrooms, which can dissuade them from applying it in their classroom practices.

Based on the literature reviewed above, most studies that have been conducted do not focus on the integration of WhatsApp in the teaching of Business Studies. For instance, Naidoo and Kopung (2016) explored the use of WhatsApp in Mathematics learning. Furthermore, Nel and Marais (2020) investigated the use of WhatsApp by preservice teachers to explain the subject content to children during the Covid -19 pandemic. Nel and Marais (2020) were not specific to any particular subject. Lastly, Rwodzi, de Jager and Mpofu (2019) explored the innovative use of social media for teaching English in South African schools. Because of this existing gap in the literature, the researchers decided to conduct a study that investigates the use of WhatsApp by Business Studies teachers in selected rural-based secondary schools in Kwa-Zulu Natal, South Africa.

4 THEORETICAL FRAMEWORK

The study adopted Everett Rogers' Diffusion of Innovation Theory (Sahin, 2006) as its theoretical lens. This theory was originally designed as an explanatory structure for adopting technology in education and in the educational environment (Sarfo et al., 2016; Medlin, 2001). Rogers states that the diffusion process is seen when innovation is communicated via certain channel over time among a particular population across different geographical areas (Gyamfi & Gyaase, 2017). Within the context of this study, the innovation is WhatsApp used in the Business Studies teaching and learning process, while the channel is the school(s) where WhatsApp is adopted in the teaching and learning of Business Studies. The population comprises Business Studies teachers who adopt WhatsApp to enhance their instructional practices. This theory explains how an innovation, which may be about an idea, behaviour, or object, is adopted among the population (Mustafa & Al-Mothana, 2013). In other words, the adoption of the theory attempts to explain how Business Studies teachers adopt WhatsApp in their instructional practices.

Furthermore, the Diffusion of Innovation Theory proposes a five-stage decision process. These stage processes are

knowledge stage which is defined as an individual's awareness of innovation (technology) and having an idea of how such innovation (technology) works (Arkorful et al., 2021). For example, for Business Studies teachers to integrate WhatsApp in their instructional practices, they need to be aware of the innovation (WhatsApp) and know how WhatsApp works in education. The second stage is **persuasion**, where an individual can positively or negatively perceive innovation or technology (Hajara & Bukari, 2017). After being aware of WhatsApp and knowledgeable about how it works in the education context, Business Studies teachers may develop positive or negative attitudes toward WhatsApp integration in their instructional practices.

The third stage is the **decision stage,** where an individual chooses to adopt or reject the innovation based on the social perspective of individual (Rogers, 2003). In other words, Business Studies teachers who perceive WhatsApp as a useful tool in their instructional practices may adopt it, while those who have negative perceptions towards WhatsApp may reject it. The fourth stage is the **implementation stage,** where the innovation or technology is used (Arkorful et al., 2021). The implementation refers to the teachers' actual integration of WhatsApp in Business Studies teaching. Lastly, **the confirmation stage** is the final stage, where an individual evaluates his/her decision to adopt an innovation (Sherry, 2011). This may result in the individual continuing or rejecting the adoption of a particular innovation. At this stage, Business Studies teachers may evaluate their decision to adopt WhatsApp as a tool to enhance their instructional practices. After the evaluation, they may continue with integrating WhatsApp if they are convinced that it contributes positively to their instructional practices or reject it if it does not work for them.

4 METHODOLOGY

This section outlines the research methodology that was adopted in this study.

Research paradigm

This study is located within the interpretive paradigm. According to Christiansen et al. (2010), the interpretive paradigm aims to understand the world through the lens of the participants. In other words, when adopting interpretive paradigm, the researchers want to see the phenomenon under investigation through the eyes of the participants. Therefore, under the interpretive paradigm the participants take center stage as they are the ones who provide meaning to the phenomenon. In this study, the researchers got a chance to listen to the participants. The participants recounted their experiences of utilizing WhatsApp when teaching Business Studies. Furthermore, the participants gave an account of their challenges when using WhatsApp in their instructional practices. Lastly, since the study is located within the interpretive paradigm, the participants were afforded an opportunity to express their views on the influence of WhatsApp in their instructional practices.

Research Approach

Qualitative research approach was deemed suitable for this study because it describes and analyzes people's individual and collective social actions, thoughts, beliefs, and perceptions (McMillan & Schumacher, 2006). Since the study investigates the utilization of WhatsApp by Business Studies teachers in rural-based secondary schools, the qualitative research approach enabled the researchers to gauge the views of the participants on the phenomenon. Mukhari (2016) asserts that the qualitative research approach allows the researchers to gain an in-depth understanding of the participants' experiences. The qualitative research approach afforded researchers the

opportunity to understand how Business Studies teachers in the rural-based schools utilize WhatsApp in their instructional practices.

Research design

Since the study adopted interpretive paradigm and qualitative research approach, phenomenology research design was considered suitable for this study. Howe (1998) believes that phenomenology research design is compatible with pure qualitative research. Phenomenology research design is more concerned with studying experiences from the perspectives of individuals (Lester, 2004). The assertion by Lester (2004) corresponds with the aim of this study which investigates how Business Studies teachers in rural-based secondary schools utilize WhatsApp in their instructional practices. The researchers depended on the participants' experiences to understand the phenomenon. Employing phenomenology research design in the study was also backed by the view that phenomenology research design allows participants to recount their experiences regarding their utilization of WhatsApp in their instructional practices.

Sample and sampling technique

The study adopted a purposive sampling method. According to Cohen et al. (2011), purposive sampling is when the researcher chooses a sample based on their appropriateness for the study. For this study, three Business Studies teachers from three rural-based secondary schools in uMkhanyakude district were purposefully selected. The participants were selected because they are teaching Business Studies, in schools located in a rural based district (uMkhanyakude) and they utilize WhatsApp in their Business Studies classrooms. In other words, the selected three teachers met the inclusion criterion.

Data collection method(s)

The study adopted face-to-face individual semi-structured interviews to collect data. Creswell (2012) defines individual interviews as a data collection method in which the researcher asks questions and records responses from only one participant at a time. Cohen et al. (2011) have found the individual face-to-face interview method as the suitable data generation method for a qualitative study because it enables the participant to provide in-depth information on the phenomenon of interest. In this study, the face-to-face individual interview method was chosen because it allowed the researchers to ask probing questions to get rich data from the participants. Furthermore, face-to-face individual semi-structured interviews enabled Business Studies teachers (participants) to provide concrete examples of how they utilize WhatsApp in their instructional practices.

Data analysis technique

The study employed thematic analysis to analyze data collected through individual face-to-face interviews as guided by Braun and Clarke (2006). Thematic analysis is a qualitative data analysis method that involves recognizing, isolating, examining, and reporting themes, patterns, and categories as they emerge from the data (Braun & Clarke, 2006). During data analysis, the researchers started by familiarizing themselves with the raw data by listening to the recordings. After listening to the tapes, the transcription process started. Researchers made use of verbatim quotations to avoid distortion and loss of meaning. After the transcription process, the researchers read the transcripts alongside with interview audio (recordings) to ensure the accuracy of transcripts. After confirming the accuracy of the transcribed data, the researchers engaged on assigning codes to the raw data. Alhojailan (2012) indicates that assigning codes to the data set helps make connections between different

parts of data generated from the participants' responses. After coding, themes were formulated, and those themes were used to analyze data.

Research ethics

Researchers maintained ethics throughout the study. To ensure adherence to the ethical requirements, the researchers applied and obtained ethical clearance from the University of the Free State, where one author is working. The participants were informed about the study, and that allowed them to decide whether to participate in the study or not. The principles of anonymity, confidentiality and informed consent were upheld.

5 FINDINGS

During data analysis, the following themes emerged: Utilization of WhatsApp by Business Studies teachers, challenges encountered by teachers when utilizing WhatsApp and the role of WhatsApp in enhancing teachers' instructional practices.

Utilization of WhatsApp by Business Studies teachers

Under this theme, teachers were asked to recount how they utilize WhatsApp for Business Studies instructional purposes in their rural school context. Various sub-themes emerged, and they are discussed below.

COVID-19 outbreak strengthened WhatsApp utilization.

During interviews with identified participants, it was discovered that at the start of COVID-19, they used WhatsApp more frequently. For example, Teacher B stated that he started utilizing WhatsApp during the lockdown period caused by the outbreak of Covid-19.

> "I *started using WhatsApp since the beginning of the lockdown caused by Covid-19*".

Other participants indicated that even though Covid-19 strengthened the rate at which they used WhatsApp in their pedagogical practices, they actually started using WhatsApp before the outbreak of Covid-19. Teacher C mentioned that:

> *"I started using WhatsApp in my early years of being a teacher, it was around 2014/15 when I started using WhatsApp to support my teaching, however, I used it mostly during the COVID-19 lockdown in 2020*".

It can be inferred from the teachers' responses that the outbreak of COVID-19 encouraged them to utilize WhatsApp in their classrooms. It can be deduced from their responses that WhatsApp became an integral tool to support their instructional practices.

Utilization of WhatsApp application post-Covid-19 lockdowns

Despite the lifting of lockdown restrictions and COVID-19 regulations in South Africa, the participants still use WhatsApp when teaching Business Studies. The participants stated that although learners are back in their classrooms fully, they still find using WhatsApp to support their instruction useful. Teacher B mentioned that he uses WhatsApp during after school hours and over the weekends. Teacher B said:

> *"I use WhatsApp to give learners more work so that they can practice after hours and during weekends*".

Teacher A mentioned that she makes use of WhatsApp to provide supplemental learning materials to enhance learners' learning.

Teacher A mentioned that:

> *"I use WhatsApp to share notes, examination timetables, and*

scope if there are upcoming class tests".

Figure 1 below displays a WhatsApp message sent by Teacher A giving learners the scope of the class test that learners were going to write the following day. It is clear from the WhatsApp screenshot depicted in Figure 1 that Teacher A continues to support learners after hours, as mentioned in the excerpt.

Figure 1: **Teacher A giving learners scope for the assessment.**

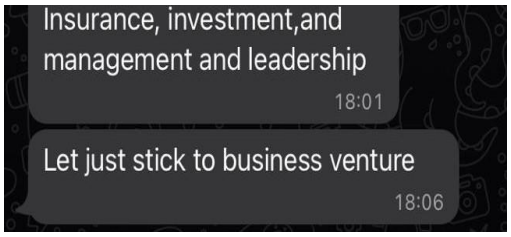


Figure 2 below shows a teacher guiding learners on what they should study in preparation for the upcoming examination.

Figure 2: Teacher gives a clarity of focus for the upcoming examination.

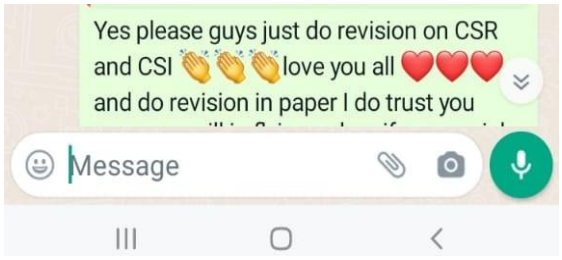
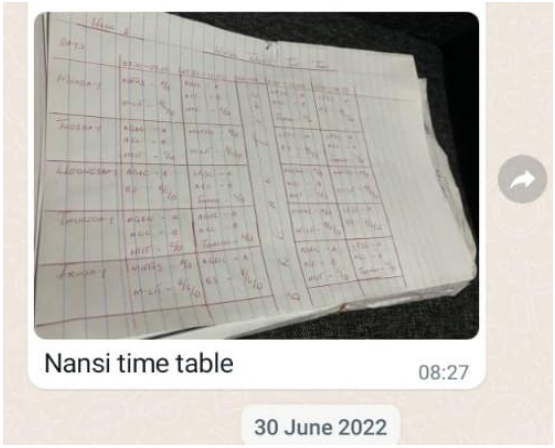


Figure 3 shows a teacher sharing a timetable for extra classes to learners over WhatsApp.

Figure 3: **Teacher sharing a timetable for extra classes.**



Teacher C added that she uses WhatsApp to answer questions asked by the learners because the time allocated for the Business Studies period each day is limited, and this results in her not being able to answer all the questions that learners have about a particular topic or concept taught. Teacher C had this to say:

"Learners ask questions of the content talk in the class via WhatsApp, and I am unable to respond because time is limited in the classroom so I cannot answer all questions during the lesson".

WhatsApp Application is easy to use.

Business Studies teachers also reflected on their preference for WhatsApp over other communication tools. The participants stated that they integrate WhatsApp into their pedagogical practices because it is easy to use and appeals to learners. The participants also indicated that WhatsApp is better to use, and it works well in rural areas. Teacher C said:

"I chose WhatsApp because I am living in rural area, and most learners are using it. So, it is easy for me to communicate with them whenever I need them. It is also a simple and the easiest platform to communicate with learners".

It transpired from this theme that Business Studies teachers mainly utilized WhatsApp to support learners after school hours. It transpired that some teachers utilize WhatsApp to complement their classroom-based instruction. Given the

time constraints they experience in the classroom, they then utilize WhatsApp to provide more support to learners. Furthermore, some teachers indicated that they prefer to utilize WhatsApp because it is the easiest tool that learners can access in their rural context. However, despite having easy access to the tool, teachers mentioned some challenges associated with utilizing WhatsApp.

Challenges associated with WhatsApp utilization in rural schools.

The participants expressed that they encounter several challenges when utilizing WhatsApp to support their instructional practices. Some teachers revealed that poor connections and lack of discipline among learners are among the challenges they face when utilizing WhatsApp in their instructional practices. For example, Teacher A reported that:

> "*The most challenge that I encounter when using WhatsApp is the poor connectivity because we are in rural areas. Also, these days, load shedding exacerbates our connectivity challenges because when there are no networks, sometimes you cannot communicate with learners in real-time to give them work to complete at home*".

Teacher C indicated that learners tend to be ill-disciplined when interacting with the teacher and their fellow learners when interacting through WhatsApp. Teacher C stated thus:

> *"Some of the learners are not disciplined; they use WhatsApp in a wrong way. They bully other learners during discussions on WhatsApp group".*

Another challenge that emerged during interviews, teachers indicated that not all learners had access to WhatsApp all the time. This is because they use their parents' cell phones and sometimes run out of data. Teacher B asserted thus:

> *"It is sometimes tough to use WhatsApp with learners since not all my learners had access to WhatsApp, some of them did not have access smart phones all the time, they relied on their parents' cellphones, and some ran out of data."*

Interestingly, teachers indicated that they have devised different strategies to deal with the challenges associated with the integration of WhatsApp in rural school contexts. Teacher A explained how she deals with the challenge of learners that display a lack of discipline on the WhatsApp platform. The participant said:

> *"Normally, I identify a learner or learners that are problematic in the subject's WhatsApp group and call them privately when we arrive at school and talk with them face to face as a way of disciplining them".*

Teacher C indicated that she maintains learner discipline by controlling the group and discussions that take place in the subject group. Teacher C stated as follows:

> "I *am the one who is the group administrator, so I am able to allow learners to participate in discussions in an acceptable manner. I remove learners that are ill-disciplined for a particular period and bring them back in the group once they promise they will behave.*"

On the challenge of learners who do not have access to smartphones or WhatsApp due to the reasons outlined above, Teacher C stated that she makes sure that learning resources sent via WhatsApp are also available in print for those learners who did not access it on WhatsApp. She stated that:

> "I *make learning resources available to learners in print to ensure that they are not left behind or excluded from learning*".

WhatsApp application enhances instructional practices.

The participants agreed that WhatsApp plays a significant role in enhancing their instructional practices. They indicated that the utilization of WhatsApp to support instructional practices ensures that learners are engaged in learning for a longer period. Teacher B said:

"WhatsApp keep learners engaged in learning because I send them activities even after school hours, and they do those activities at home and during the class they become active because they are familiar with the content".

Figure 4 depicts a message sent by the teacher to learners indicating activities they should cover before coming to class.

Figure 4: **Teacher C give learners activities to do at home**.

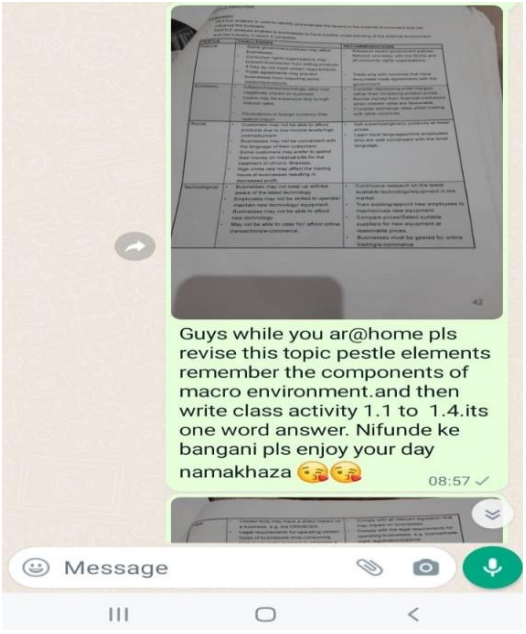
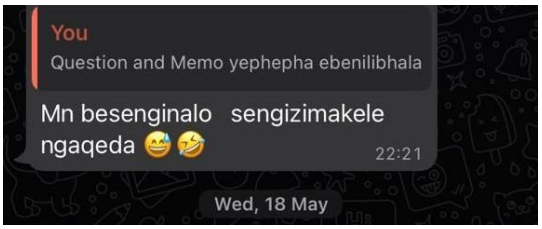


Figure 5 depicts a message from one of the learners communicating in the WhatsApp group at 22h21 PM using their home language (IsiZulu), indicating that he/she has finished the activity given to them by the teacher and he/she has even marked the activity on her own.

Figure 5: A message posted by a learner on the WhatsApp group.



In overall, figures 1-5 show the level of engagement between teachers and learners. From the engagement captured in WhatsApp screenshots shown above, it appears that most of the engagements happen after hours, where teachers provide continuous support to learners. It also transpired from the data that learners actively engage in learning over WhatsApp.

The WhatsApp screenshots confirm Teacher C's assertion that WhatsApp promotes active learning among learners because some prefer to participate in WhatsApp discussions, but not face-to-face discussions. Teacher C mentioned thus:

> *"WhatsApp encourage learners to participate because some learners are shy, so they choose to participate in WhatsApp discussions than in contact class discussion. They ask questions and respond to their peers' questions."*

The participants also indicated that using WhatsApp in Business Studies instructional practices helps teachers and learners to access learning resources they could not have access to without the use of technology. Teachers acquire resources from well-resourced schools and share with the learners through WhatsApp. The participants indicated that this had relieved them from overreliance on textbooks, which sometimes may contain outdated information. Teacher A said:

> *"As teachers, we are able to get resources from well-resourced schools and share them with our learners. This means now we do not*

only depend on textbooks, but we also use other resources."

Divergent views on WhatsApp integration inside the classroom

Despite the positive views of the participants on the role of WhatsApp in enhancing the teaching and learning process, it transpired that teachers have divergent views on making use of WhatsApp inside the classroom. Factors such as school rules that prohibit the use of cellphones within school premises by learners and ill-discipline among learners were cited as the reasons that dissuade teachers from utilizing WhatsApp inside the classrooms. Teacher B said:

> "*You know the kind of kids we teach today, they are unruly somewhere, somehow so using WhatsApp inside the classroom can worsen learner misbehavior*."

Teacher A concurred with this view, stating that:

> "In *my view, I don't think the utilization of WhatsApp can be normalized within the classroom because learners are not disciplined, and this can distract them from their studies. This can only work in schools that have disciplined learners. With us, we can only use it as an additional tool*".

On the other hand, Teacher C believes that the utilization of WhatsApp inside the classroom should be formal and normalized. She is of the view that learners spend a lot of time on their cellphones, and utilizing WhatsApp to support teaching and learning inside the classroom can enhance learners' learning.

She said:

> "*I think the utilization of WhatsApp in the classroom can enhance learners' learning because learners spend a lot of time on WhatsApp and using it inside the classroom can make learners learn while enjoying their gadgets*".

6 DISCUSSIONS

The study explored the utilization of WhatsApp by Business Studies teachers in rural-based secondary schools in South Africa. This study found that the outbreak of COVID-19 pandemic strengthened Business Studies teachers' utilization of WhatsApp in their teaching. This finding is in line with that of the study that was conducted by Susilawati and Supriyatno (2020) which found that the lockdowns caused by the outbreak of COVID-19 increased teachers' use of WhatsApp in their classrooms. Furthermore, the current study revealed that Business Studies teachers perceive WhatsApp as the easiest tool to utilize compared to other technological platforms. In their study, Jafre et al. (2018) found that teaching using WhatsApp is easy for both teachers and learners because learners are accustomed to WhatsApp. Findings from the study also revealed that WhatsApp keeps learners engaged in learning for a longer period of time. WhatsApp ensures the continuation of learning beyond class hours (Bouhnik & Deshen, 2014). It was also unearthed from this study that WhatsApp serves as a platform where learners and teachers can share learning materials such as notes, previous question papers and scopes. In the same vein, the study by Mazana (2018) indicated that WhatsApp helps teachers and learners share links, notes, and assignments.

Despite several benefits of utilizing WhatsApp in Business Studies teaching, the study also revealed several challenges associated with utilizing WhatsApp in teaching Business Studies, especially in rural-based secondary schools. The study found that utilizing WhatsApp can be a challenge due to a lack of discipline among learners. Similarly, Mazana (2018) found that learners can misuse WhatsApp if they

lack proper discipline. Also, another challenge revealed in this study is that not all learners have access to smartphones and WhatsApp. In their study, Indiran et al. (2022) found that some learners do not have access to WhatsApp, especially schools that are in rural areas. Connectivity issues were also found to be a serious challenge for the utilization of WhatsApp for teaching and learning purposes. Nsabayezu et al. (2020) also revealed that a lack of internet connection hinders the effective utilization of WhatsApp in the teaching and learning process.

Interestingly, besides the challenges reported, this study found that Business Studies teachers believe that WhatsApp enhances their instructional practices. This finding is against the results of the study by Abualrob and Nazzal (2019) which reported that teachers and learners mainly use WhatsApp for non-instructional purposes. Finally, the study revealed that Business Studies teachers have divergent views on the utilization of WhatsApp inside the classroom. This is against the findings of the study by Budianto and Arifani (2021) which found that WhatsApp can be used in the classroom as the primary tool for teaching and learning.

Based on the findings above, it can be suggested that all participants have adopted the innovation, which is WhatsApp, as the proponents of Diffusion Theory suggest. The adoption of WhatsApp by Business Studies teachers indicates that they are all aware of the innovation (WhatsApp) and how it can be utilized in teaching and learning. It also transpired from the study that the participants hold positive perceptions towards the role of WhatsApp in the teaching and learning process. For this reason, the participants decided to adopt WhatsApp in their teaching practices. Finally, the study gave teachers a chance to confirm or evaluate the innovation (WhatsApp), and teachers explicitly stated the challenges associated with utilizing WhatsApp in teaching Business Studies in the rural context. However, they reiterated to continue utilizing WhatsApp in their instructional practices.

7 CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, we conclude that Business Studies teachers view WhatsApp as a tool that is useful in supporting their instructional practices. Teachers indicated that utilizing WhatsApp helps them to provide continuous support to learners by providing extra learning materials. The utilization of WhatsApp in Business Studies instructional practices enables teachers to provide immediate feedback to learners and continuously interact with them. The study also revealed that teachers encounter several challenges when utilizing WhatsApp in a rural context. However, they devise strategies to overcome those challenges. Based on these findings, the study recommends that Business Studies teachers strengthen the use of WhatsApp to support learning because in most rural schools, this is the only technological tool that some learners can easily access after school. Furthermore, the Department of Basic Education should consider developing a framework that would guide teachers on utilizing social media tools, including WhatsApp, in their classrooms. For future research, this study recommends that a study of a similar nature that would involve learners be conducted.

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A Self-Determination Theory Perspective of Teacher Motivation and Self-Directed Learning Skills to Enhance Academic Performance in Selected Lower Quintile Primary Schools

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ABSTRACT

Learners from low socioeconomic contexts are often instructed by poorly trained and qualified teachers, causing them to be often poorly motivated for their tasks, which is detrimental to learner performance. This study explored (a) factors that influenced the motivation and teaching behaviour of lower quintile schoolteachers with a view to enhancing learner academic performance and (b) the self-directed learning skills reflected in teachers' teaching behaviour that enhanced learner academic performance. This study followed a basic qualitative study method in which semi-structured interviews were conducted with 12 purposively selected teachers from lower quintile primary schools. The participants listed a supportive school environment, collegiality, organisations, and community projects that support education in small towns as extrinsically motivating contextual factors. Furthermore, the reciprocal influences of communities with a low socioeconomic status, poor parental involvement, ill learner discipline, and limited support from the Department of Basic Education in providing specialised psychological and remedial support for struggling learners were factors that had a negative bearing on the participants' relatedness, competence and autonomy. Future research is needed to explore the drivers of motivation in lower quintile schoolteachers by using a greater sample of participants from primary and secondary schools.

Keywords: Motivation, lower quintile schools, Self-determination theory, Self-directed learning, Teachers

INTRODUCTION

Quality education for all learners hinges on well-qualified, trained, adequate, and motivated teachers (UNESCO, 2021). Teacher motivation hence affects the quality of teaching and thereby impacts learner academic achievement (Fives & Buehl, 2016). In the same vein, Voskamp et al. (2020) aver that all countries, regardless of their socioeconomic status, need teachers who are motivated to achieve the educational goal of developing self-directed, intrinsically motivated learners who can function effectively in the twenty-first century.

PROBLEM STATEMENT

Despite the importance of motivated teachers, Iliya and Ifeoma (2015) have both expressed and observed an increasing concern about the generally low or declining motivation levels among formal public schoolteachers in developing countries. This dwindling motivation is a problem because motivated teachers are particularly essential for disadvantaged learners from low socioeconomic contexts (Dembélé &

Rogers, 2013). The sad reality is that learners from these contexts are often taught by demotivated, poorly trained and qualified teachers instead. Teachers in low socioeconomic contexts are depicted as demotivated and blamed for the deteriorating learner performance and learning outcomes. Unmotivated teachers and poor socioeconomic contexts are a detrimental combination preventing learning and learner success (Mlachila & Moeletsi, 2019; Roodt, 2018). Notwithstanding the negative portrayal of teachers in social media and government reports as demotivated, Condy and Blease (2014) aver that, in the public's opinion, there are also many South African teachers who are motivated and dedicated to educating learners despite the challenges described in this article.

Despite the great need for teacher support from the education system and the necessity of motivated, capable teachers in developing SDL, most efforts to improve the quality of education in South Africa have focused on providing schools with physical resources rather than providing teachers with resources to improve their teaching competence and motivation, help them achieve educational outcomes and, thus, help learners become self-directed learners (Yiga et al., 2019). Furthermore, most South African studies on teacher motivation discount contextual challenges and the snowball effect these have on the experiences and motivation of teachers in lower quintile schools. Hoy (2021) affirms that the interpersonal, economic, and political contexts which affect teachers' praxis are often overlooked. It is evident that research is required to address these lacunae in the body of literature and thereby improve teacher motivation and thus also learning and performance in learners, especially within lower quintile schools.

PURPOSE STATEMENT

The purpose of this study was to explore what influence teachers' motivation and perceptions of their relatedness, competence, and autonomy to develop SDL skills of learners in their teaching context.

RESEARCH QUESTION

Against this background, the following research question was posed: What influence teachers' motivation and perceptions of their relatedness, competence and autonomy to develop SDL skills of learners?

The subsequent sections outline teachers' perceptions of their motivation and factors that can influence teacher motivation. Ryan and Deci's (2002) SDT is presented to conceptualise how motivational factors can influence teacher motivation and teaching behaviour and enhance learner academic performance. SDT offers a suitable framework for this study, as it concerns not only types of motivation but also the circumstances that promote and maintain motivation. This article concludes with the empirical section of the study and the findings.

THEORETICAL FRAMEWORK

Schunk et al. (2016) distinguish between extrinsic and intrinsic motivation, where motivation can be inferred from a person's actions, effort, persistence, goals, and verbalisations. Dörnyei and Ushioda (2011) define teacher motivation as that which drives teachers' decisions and goal setting, their efforts to sustain an activity, and their persistence in pursuing an activity.

LITERATURE REVIEW

Factors that influence teacher motivation

When differentiating threats to teacher motivation, Frase (2002) distinguishes between work context factors (the teaching environment) and work content factors (teaching). Work context factors encompass teachers' baseline needs, such as manageable class sizes, favourable discipline conditions, availability of teaching materials, the quality of the principal's supervision and the meeting of basic psychological needs, such as money, status, and security. Work content factors comprise prospects for career development, recognition, challenging and varied work, increased responsibility in the institution, accomplishment, empowerment, and authority. Richardson (2014), Iliya and Ifeoma (2015), and UNESCO (2021) identified various interacting influences on teacher motivation that overlap with the work context and work content factors mentioned by Frase (2002). These influences include compatible teacher salaries, recognition for performance, social respect for the teaching profession, harmonious relationships with the school community, accountability and support from the institution, managerial excellence in the institutional environment, the opportunity to have input at school management and policy level, and decent physical teaching conditions and learning materials.

Usher (2021) avers that teacher motivation is influenced by the interacting influence of personal factors, environmental factors and teaching behaviour. Personal factors include teachers' perceptions of their competence, their sense of belonging in their teaching contexts, enthusiasm for teaching, and perceptions of their teaching responsibilities. Environmental factors involve, among others, teacher-school collaboration, principal instructional leadership, support or pressure from school principals, the school's social context, and parental involvement. The quality of teaching behaviour can be deduced from teachers' classroom management, the cognitive support they offer, the cognitive activation they use in their lessons, their autonomy-supportive teaching strategies, and the social and emotional support they provide to learners (Usher, 2021). Hoy (2021) affirms that learners are strongly motivated to learn when they recognise a caring connection with their teachers, especially those learners who experience challenges at home or school.

This study explored teacher motivation through the theoretical lens of SDT by Deci and Ryan (2002), which is discussed in the following section.

Self-determination theory

Ryan and Deci's (2002) SDT distinguishes between extrinsic motivation, intrinsic motivation, and amotivation, each reflecting varying levels of self-determination. SDT asserts that an individual's motivation is influenced by three basic psychological needs: competence, relatedness, and autonomy. These three needs must be met before an individual will experience the intrinsic motivation to learn, engage with others, perform in academic settings, and grow psychologically (Deci & Ryan, 1985).

The SDT could shed light on whether the participants' (teachers') motivation is influenced by intrinsic, extrinsic, external, introjected regulation, regulation through identification, or amotivation and how these influence their teaching behaviour (discussed in more detail in the next paragraph). SDT could shed light on the extent to which the teachers' three basic psychological needs,

namely competence, relatedness and autonomy, are met in the three lower quintile schools.

Intrinsic motivation relates to the most self-determined level of motivation and is evident when an individual pursues an activity out of task interest and enjoyment rather than external recognition or rewards (Ryan & Deci, 2002). Extrinsic motivation is the pursuit of activities to attain recognition, rewards or outcomes rather than enjoying the activity itself (Ryan & Deci, 2002). According to the SDT, extrinsically motivated goals and behaviour can be assimilated into intrinsic goals and behaviour and can thus easily be mistaken for intrinsic motivation.

Ryan and Deci (2002) highlight four forms of self-determination and autonomy that distinguish true intrinsic motivation from extrinsically motivated goals. The least autonomous form of extrinsic motivation is external regulation. In this instance, an individual's motivation is driven by external factors such as reward and recognition, which encourage them to pursue or perform something. The second type of extrinsic motivation is introjected regulation, which describes individuals whose performance and achievement are driven by feelings of pressure to meet others' expectations, as well as guilt, anxiety, pride, and egoism (Vanasupa et al., 2010). Individuals can also demonstrate a more autonomous or self-determined form of extrinsic motivation, which is called regulation through identification. Regulation through identification manifests when an individual knowingly values and commits to a goal and makes it a personal goal. An example is teachers who motivate their learners to study hard because they see it as relevant, valuable, and necessary for learners to perform academically and reach a life goal of secondary and tertiary studies. The last and most autonomous form of extrinsic motivation is integrated regulation, which occurs when identified regulations have been fully assimilated into an individual's beliefs, values, and personal needs. Integrated motivation seems similar to intrinsic motivation but is still classified as extrinsic motivation because the goals that individuals are trying to achieve are for reasons extrinsic to the self rather than for the natural enjoyment of the task (Vanasupa et al., 2010). The third type of motivation is amotivation, which refers to a complete absence of any motivation or self-determination to pursue an activity (Deci & Ryan, 2002).

According to the self-directed learning theory (SDT), an individual's social context influences their motivational regulations indirectly by meeting three innate psychological needs – autonomy, competence, and relatedness (Deci & Ryan, 2002). In the context of this study, the interrelated influences on teacher motivation will affect the outcome of the teachers' three basic needs being met, as explained by Richardson (2014), Iliya and Ifeoma (2015), and Usher (2021) and described above.

Autonomy refers to the degree of choice and control an individual feels they possess in pursuing an activity and the need to feel that an activity is consistent with their values (Ryan & Deci, 2002). For example, teachers' need for autonomy will be met if they have the freedom to decide on and implement new ideas with the support of the principal or school management team. Ryan and Deci (2002) explain that autonomy support entails the support of perspectives, thoughts, questions, and initiative by an individual who is often in a position of authority. This entails a strong element of competence on the part of the school principal or management as well as the teacher.

Competence signifies the need to interact effectively with the environment

and reach valued outcomes. The need for competence involves feelings of efficacy when an individual interacts with the social environment and has the opportunity to exercise and express their capabilities (Deci & Ryan, 1985). The desire for competence will lead teachers to pursue challenges that are suited to their capability and enhance that capability through activities in class. It is my belief as an educator and researcher that the more competent teachers perceive themselves to be in a particular task, the more intrinsically motivated they will be to pursue their goals and thereby achieve a greater sense of wellbeing. For example, teachers will be more intrinsically motivated if they perceive themselves as self-directed learners and are able to teach their learners so that they achieve academically. I also believe that teachers' perceptions of competence will be enhanced if their teaching competence is validated and their input in education supported by the DBE, principals, school management teams, and staff. Positive perceptions of their self-efficacy and competence can also be experienced when teachers see how their teaching and engagement add to learners' academic progress and personal growth.

Relatedness refers to the basic need to feel connected to others in one's social context and feelings of being cared for and respected and belonging to an individual's or one's own community (Ryan & Deci, 2002). In the context of this study, significant others for teachers refer to the stakeholders in education, such as the DBE, the school as an organisation with principals, school management teams, parents, staff, and learners. According to Thoonen et al. (2011), schools with sound working conditions, support, and cooperation among the personnel satisfy teachers' need for relatedness and can further motivate them to experiment with new approaches to improve their teaching activities. Such teacher collaboration fosters autonomy and relatedness as it allows teachers to share their ideas, solve problems together with personnel, and gain feedback and information based on others' experiences. Teacher collaboration thus provides support to teachers, triggers professional culture, and enhances intrinsic motivation. Teachers' need for relatedness can be met if they experience harmony between their personal commitments and interests and those of other stakeholders in education, such as the DBE, parents, staff members and learners (Thoonen et al., 2011).

METHODOLOGY

Empirical investigation

The study was a qualitative one built on the constructivist paradigm. A basic qualitative study enables an inquirer to explore how people make sense of their world and what they experience within the world (Merriam, 2009). A constructivist paradigm was suited to the epistemological position of this study, as the intention was to "[understand] the world of human experience" (Cohen & Manion, 1994, p.36) in which "reality is socially constructed" (Mertens, 2005, p.12), which required a more personal manner of data collection and analysis. Consequently, this study's qualitative research methodology was fitting for the real-world settings and lived experiences it was intended to explore. The SDL skills that are enhanced in learner academic performance through improved teacher motivation were identified from the responses of the 12 research participants.

After obtaining permission from the DBE and ethical clearance from the university under whose auspices the study was conducted, I employed an independent person to recruit participants for this research. Lower quintile schoolteachers were purposively selected as I was

interested in their subjective interpretation of the complexity of their own motivation as a tool to improve teacher motivation and thereby enhance learner academic performance. Five primary schools were selected but only three primary schools volunteered to participate in the research. Since a small sample size was desired to conduct in-depth interviews, only four teachers from three schools were purposively selected to participate in the study voluntarily. The schools are located in the Eastern Cape province, which is known for its poor academic results. The language of instruction in all three schools is English and Afrikaans, and the learners who attend these schools are English, Afrikaans, and isiXhosa-speaking learners. I abided by all ethical aspects of conducting research, which included obtaining informed consent from the participants and respecting and upholding confidentiality and anonymity (Creswell & Creswell, 2018).

I used individual semi-structured interviews to gather in-depth information. Content and thematic analysis were used to analyse the data as part of a hybrid approach to data analysis by Fereday and Muir-Cochrane (2006), which allowed the use of both deductive analysis and inductive analysis. Purposive sampling was used to build a trail of evidence from the data collection together with rich, descriptive findings "thick" in detail supported by verbatim quotes from the data, and participant validation were used to produce trustworthy reliability (Creswell & Creswell, 2018).

The data analysis process that was conducted according to the above premises is presented under the themes and sub-themes it generated below. The schools have been coded as S1, S2 or S3, and the participants are referred to as P1, P2, P3, and so on.

DISCUSSION OF FINDINGS

To answer the research question, participants were asked whether they perceived themselves as motivated, to give reasons therefor, and to explain what kept them motivated (or demotivated) to help learners achieve academically. I used a priori codes derived from the literature to categorise the responses referring to teacher motivation and SDL as well as an inductive approach where the themes created are linked to the interview data (Fereday & Muir-Cochrane, 2006). The following themes emerged from the study.

Perceptions of motivation

Although all participants perceived themselves as being intrinsically motivated, only three participants' responses (S1P1, S2P7, S1P3) seemed to reflect the characteristics of intrinsic motivation. S1P1 described themself as "*a self-motivated person [who loves] teaching [and who plans], set[s] goals for lessons, and will seek help until [they achieve their goals]*".

Other participants used words such as "passion", "love", and "commitment" to describe their intrinsic motivation. However, a closer analysis of what appeared initially to be intrinsic motivation based on the responses revealed that most participants' motivation could be classified rather as externally regulated or motivated by introjected regulation (Ryan & Deci, 2002).

P5S2 perceived themself as an intrinsically motivated individual while they were regulating through identification with the goals of education, expectations from the school community, motivation from teaching expertise and experience that drove their motivation (Usher, 2021). The participant expressed:

> "*You cannot be without hope, irrespective of what is going on in schools today. I am a teacher for 27 years and I always said I want to make a change in this community. Our community look up to teachers so we cannot be without hope and motivation for our community's sake"* (P5S2).

Extrinsically integrated sources of motivation

This theme revealed that most participants had extrinsically integrated sources of motivation rooted in their perceptions of their teacher responsibilities (Usher, 2021) and the social context of the lower quintile schools where communities rely on schools not only for their children's academic performance but also their holistic education.

Participants referred to the emotional and social support teachers provide learners, such as hope, empathy, and a positive mindset; these can be associated with their basic need for relatedness within their social contexts (Ryan & Deci 2002). S1P4, for example, clarifies: "*You must have hope; otherwise, you will fail your learners and many other people"*.

A few participants (S1P2, S1P3 and S2P7) found their motivation from internal, spiritual, and altruistic sources. S1P2 explained*: "When I feel unmotivated, I pray. I read the Bible and even use Jesus as an example to motivate myself and my learners"*. S2P7 elucidated*: "I get motivated through the Grace of God. Every day He gives me new hope and energy, and I carry that over to my learners"*.

Other responses were related to a positive mindset and awareness of how one's disposition can influence learners and other staff. P5S2 clarified:

> *"You must have empathy. I put myself in the shoes of these children and the problems they experience at home. You must have passion and a love for your work. To cater for and help the poorest of the poor… that is my motivation."*

S1P4 further mentioned: *It is difficult to stay motivated, but you must have hope and get yourself up, otherwise you will fail your learners and many other people in this country"*. In the same vein, S3P9, S3P10 and S3P11 expressed that they believed human learners need kindness to keep them motivated.

The responses above seem to indicate extrinsically integrated motivations, given that the type of motives the participants expressed and the goals they set out to achieve were for reasons extrinsic to the self (Ryan & Deci, 2002; Vanasupa et al., 2010). For example, participants S1P4, S2P5 and S3P10 are motivated by their professional responsibilities as teachers and role models to achieve the broad educational goals set by the DBE and the school. Thus, participants' motivation is really influenced externally by the social context of their classrooms and learner interactions that create a sense of belonging for them and their learners (Ryan & Deci, 2002; Usher, 2021).

Motivational effects of relatedness

Participants from schools 1 and 2 (S1P1, S1P3, S2P3, S2P8) mentioned a supportive school environment, manageable class sizes and useful resources for teaching (Frase, 2002; Iliya & Ifeoma, 2015;

Richardson, 2014, Thoonen et al., 2011) as sources of their motivation. All the participants from school 1 emphasised the support of their principal and school management team as factors that influence their motivation to enhance academic achievement (Thoonen et al., 2011). One participant elaborated:

> *"I seek help from more experienced teachers. The principal and SMT is [sic] always supportive; they will praise and approve any of my ideas if it benefits the children in their learning. We have resources here, neat classrooms, Internet…"* (S1P3)

The involvement of organisations such as the United Nations Children's Fund (UNICEF) and the Cookhouse Windfarm Project, together with other resources from organisations like SASKO (*Suid-Afrikaanse Sentrale Koöperatiewe Graanmaatskappy*) and the contributions they receive in the form of learning materials, has had a positive influence the participants' need for competence, autonomy, and relatedness. The participants explained that the support they received aided them in doing their work better:

> *"Our Foundation Phase learners received beautiful reading books from SASKO"* (S3P9).

> *"Our principal wrote a letter to UNICEF. They donated ten laptops that I use in the multigrade classes. While I am busy with one grade, the other grade can use the laptops to do activities"* (S3P11).

It was remarkable that only one participant (S1P1) mentioned the DBE as a motivational factor. S1P1 reported that she was motivated by the workbooks the DBE distributed, as these made teaching and assessment easier for her.

Contrary to the views above, one participant (S2P7) expressed*:* "*The school gives support, but nothing is done at this school to personally strengthen us to make us feel we are cared for as human beings"*. Some participants' needs for relatedness with parents were met through their interactions during the training of parents at teacher-parent meetings. The following responses exemplify their extrinsic motivation:

> *"Luckily, the GM Foundation assists us how to train [sic] parents to help them understand the curriculum"* (S1P1).

> *"At least the Siyawela Programme of Cookhouse Windfarm helps us to guide parents [on] how to help learners at home with routine and interest in schoolwork.* (S2P7)

The General Motors (GM) Foundation, sustained by the Cookhouse Windfarm Project, has empowered the participants to become competent in guiding parents to give their children cognitive, emotional, and motivational support. The participants also reported that they had the autonomy to decide how to work with their learners' parents. Participant responses (S3P12, S3P9) revealed teachers' efforts to involve parents in their learners' academic performance. As such, these teachers, too, are extrinsically motivated and likewise use extrinsic rewards to motivate their learners. S3P9 clarified:

> *"I get motivated when I see how our learners*

> *perform in competitions such as the WOW Afrikaans spelling competition. I write reports about them in the local newspaper to motivate them and their parents. Every Monday at assembly … we announce the star of the week in each grade; we also reward our top ten achievers quarterly. At the assembly, we also reward them for values such as kindness and honesty.*

The most challenging aspect of participants' relatedness with parents appears to be the reciprocal influences of poor parental involvement commonly found in low socioeconomic status communities where learners lag behind with a myriad of emotional, motivational and educational problems. The following response of S1P4 encapsulates many participants' helplessness and frustration:

> *"This whole community makes it difficult. The conditions of many learners are atrocious. I can see the alcohol foetal syndrome in so many learners, but the Department does not do their part. Where are the social services? Many learners cannot concentrate in class. All they care about is that learners must pass or be progressed. Parents are just not interested".*

These challenges compromise participants' sense of competence, since they do not have faith in the parents' commitment to cooperate with schools and act in the interest of their children's best education. There seems furthermore to be little alignment between participants' educational goals for learners, parental support, and support from the DBE regarding specialised psychological and remedial guidelines to attain these goals (Ryan & Deci, 2002).

Motivational effects on competence

A few of the participants' (S1P3, S2P8, and S3P9) need for competence was extrinsically motivated by their learners' progress and the acknowledgement they received for their competence when their learners performed well in competitions. Participants' (S2P7, S2P8, and S3P10) expressed that their needs for competence were not met because of work content factors (Frase, 2002; Richardson, 2014). They mentioned, in particular, that the DBE workshops they attended were too general and only focused on content and assessment issues, thus not very useful in unique teaching contexts. Participants also felt that they were uninformed about alternative pedagogical methods to support struggling learners: *"The majority of them are repeaters with learning problems; what can I do?*" (S2P8). S3P10 added: *"In a multigrade class, learners with learning problems suffer the most. They are so dependent on me, when I am busy with another grade they cannot continue with the work on their own".*

Participants' (S1P3, S2P5, S2P8, and S2P7) perceptions of their competence were also affected by their perceived inability to connect with uninterested, ill-disciplined learners and learners with learning problems. Another challenge relating to perceptions of competence is the use of English as the language of instruction. S1P1 indicated that learners' poor English language proficiency influenced their engagement with the learners. They explained that many learners never speak English at home, as many often live with their grandparents who only speak isiXhosa or Afrikaans. These learners do not necessarily have the adequate skills to learn and understand effectively in English.

Motivational effects on autonomy

Two participants mentioned that they have the autonomy to experiment with teaching methods, for example, teaching creative writing outside the classroom. These examples of autonomy and teacher motivation have been confirmed by Ryan and Deci (2002) and Usher (2021), who found that teachers' autonomy is positively influenced by good principal instructional leadership and support from school principals. S1P3 explained: *"The principal and SMT is [sic] always supportive; they will approve any of my ideas as long as it benefits the children in their learning".*

S2P7 experienced the development of study skills and other lifelong learning skills as time consuming because the curriculum already has too much content to teach in the time the Department has designated. This participant's external regulation (Ryan & Deci, 2002) stemmed from a fear of non-compliance, as they mention: *"I don't do new things, be safe and do just what the Department requires"*.

Learner discipline is an area that affects teacher motivation. The many laws and policies on learner discipline made participants cautious to discipline learners. It can be deduced that they might experience a lack of autonomy to handle discipline problems in their classes and, therefore, rely on their principals and school management teams to handle such problems.

Self-directed learning skills developed to enhance academic achievement.

Participants were also asked to describe what strategies they used to enhance learner academic performance. Responses revealed that various SDL skills such as goal setting, planning, positive motivational beliefs, metacognitive monitoring, resource finding skills and self-reflection were developed to enhance academic achievement. Most of the responses indicated the provision of motivational and emotional support to enhance learning, which corroborates the findings of Usher (2021). S3P9 clarifies*: "I try to get down to their level, I show that I have educational expectations for them, ask them about their dreams, I open myself up on a personal level so that they can connect with me."*

Given the school community's socioeconomic conditions, it is understandable that participants emphasised these types of support to enhance academic achievement. S3P11 explained that teaching learners to have distal goals kept them focused and motivated to learn. S3P11 illustrated with this example: "*I ask them, do you also want to work on a farm forever, or drive a tractor? You can also be a teacher or a lawyer one day if you work hard now".*

A few participants exposed learners to different learning strategies, such as cooperative and problem-based learning. S1P1 gave their learners cooperative homework tasks to teach them to take responsibility for their own learning and broaden their thinking skills while working with peers. However, no solution is without its issues: Some parents have objected to the former learning practice over concerns about their children's safety: "*Parents called me to say they do not want their children to work with other learners at their homes or places where their safety cannot be guaranteed"* (S1P1). These concerns are comprehendible, considering the prevalence of crime and bullying in many low socioeconomic communities.

Participants reported that they also provide cognitive support: "*I give extra lessons for the struggling learners"* (S1P1). S2P5, S2P6, and S2P8 mentioned using a

drill-and-practice approach for struggling learners and roleplay and humour in lessons to engage learners. Strategies for cognitive activation mentioned were oral questioning to activate prior knowledge. S1P1, S1P2, S1P3, and S2P7 modelled metacognitive monitoring in teaching learners to monitor their own understanding and progress through self-questioning.

Participants further reported using scaffolding, adjusting teaching strategies, or finding supplementary resources as measures to support learners. They assisted struggling learners by using YouTube videos, mnemonics, time planning on mind maps, and teaching them imagery to aid their visual memories (S1P1, S1P2, and S1P4). S3P10 reported: *"I explain the rubrics to them so that they know what to do. I tell them to do research to get more information"*.

Two participants referred to the important skill of autonomy in learning. S2P7 confirmed:

> *"I even use extramural activities to develop my learners' self-directed learning skills to plan, to work together with other learners and to learn to take responsibility for what you must do and to take turns to be leaders"*.

Exposure to these SDL skills is beneficial if learners are able to transfer these skills to their academic learning, which can enhance learner academic performance. S1P1 developed autonomy by teaching learners how to conduct a task analysis and then allowing them to choose their own group members, decide on what resources they needed, and how, when and where they would complete the tasks.

CONCLUSION

The aim of this study was to explore what influence teachers' motivation and perceptions of their relatedness, competence, and autonomy to develop SDL skills of learners. This study revealed that most participants' sources of motivation were extrinsically integrated motivation that stemmed from their need for relatedness with learners and the broader school community (Iliya & Ifeoma, 2015; Richardson, 2014), other work content factors such as availability of teaching materials, the quality of the principal's supervision mentioned by (Frase, 2002), their teaching self-efficacy, and their enthusiasm for teaching (Usher, 2021). Participants reported that environmental factors such as departmental support, effective teacher and school collaboration, motivational climates at schools, principal instructional support, and parental involvement as areas that affected the need for relatedness. Teachers also reported that the DBE workshops they attended in the past did not address their unique teaching contexts, which had a negative influence on their perceptions of their own competence. Participants also felt insufficiently equipped to teach ill-disciplined learners and learners with learning problems, and departmental time pressures to complete the syllabus basic jeopardised the need for autonomy. Amotivation was not prevalent in any of the participants' responses, which contradicts the findings of Iliya and Ifeoma (2015), Roodt (2018), and Mlachila and Moeletsi (2019), who reported declining motivation levels among teachers in low socioeconomic communities. However, this research does corroborate the findings of Condy and Blease (2014), which include that there are still many motivated, committed teachers who work conscientiously to educate learners despite the circumstances in which they educate.

The participants developed many SDL skills directly and through modelling, social and emotional support, goal setting,

resource findings skills, task analysis, strengthening motivation to learn and task strategies. Surprisingly, many participants still emphasised drill and practice in their teaching. This transmission style of teaching may still be useful in lower quintile schools where learners experience learning backlogs, poor parental involvement is prevalent, and learners depend greatly on guidance and support from their teachers to perform academically.

RECOMMENDATIONS

The results illustrate the need for professional development that would increase teachers' motivational beliefs to handle environmental factors in lower quintile schools that deter their teaching behaviours from facilitating academic achievement. Teachers will benefit from context-specific workshops that empower them with pedagogical strategies to deal with ill-disciplined learners and learners with learning barriers in lower socioeconomic contexts. The DBE and schools should facilitate training to foster parental involvement in their learners' academics and satisfy teachers' need for relatedness with parents and the broader community.

There is a need for a renewed awareness among the DBE, school leadership, and personnel of the indispensable role that each play in the other's perceptions of their own competence, relatedness, autonomy and, ultimately, teacher motivation. While the findings of this study did not reflect low teacher motivation in poor socioeconomic contexts, many other variables were not accounted for that could also influence motivation. Future research is therefore needed to explore the motivation of lower quintile schoolteachers with a larger sample of participants from primary as well as secondary schools.

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Gender Beliefs Framed on Culturo-Techno-Contextual Approach About Learning of Difficult STEM Concepts in African Secondary Schools

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ABSTRACT

This study employed a survey and quasi-experimental design. The purpose of this study is to find out the efficacy of the lecture method, and culturo-techno-contextual approach on students' gender and attitude to logic gate. Results obtained from the survey in the first phase revealed logic gate, problem-solving skills, and machine language as the most difficult topic in computer studies. The second phase is a quasi-experimental design guided by two research questions with three public junior schools (equivalent to 8th grade) in Nigeria and Ghana. 38% (80) of the respondents were males while 62% (133) were females. Logic gate attitude (LGSAQ), and the student interview guide were used to collect data for the study. The data gathered was subjected to analysis of covariate (ancova), and the results showed no significant difference in students' gender taught using the culturo-techno-contextual approach, and the lecture method [$F(1, 210) = 2.18$; $p>.05$]. Based on the findings of the study, CTCA is recommended to computer studies teachers in Africa and beyond as a possible tool to set their teaching methods within culturally relevant and technologically appropriate contexts.

Keywords: Attitude, Gender, Culturo-Techno-Contextual Approach, STEM

INTRODUCTION

With technological developments over the past few decades, computing technology has become ubiquitous in today's world. Computer science education, as an academic discipline, is receiving increasing attention from education researchers, policymakers, and practitioners (Okebukola, 2020). Education being the lifeblood of a nation (Potokri, 2010), maybe a systematic process that yields encouraging changes within the behaviour and lifetime of humans. According to Yu, Fan, and Lin (2015), education denotes to the possession and advancement of skills and knowledge via a learning process. It "entails the passing down of information, skills, attitudes, culture, and other values from one generation to the next" (Soetan, Onojah, Alaka, & Aderogba, 2021, p.104).

The need for technological innovation has brought a revolution in the development of technological applications in education. This thus has contributed to the issue of educational systems. "Educators are fast realizing that the utilization of computer-assisted teaching and learning might thus be convenient for the users" (Ebrahimi & Jiar, 2018, p. 54).

Computer-related apps are increasingly used to support and assist children with unique educational requirements. "Information and communication technologies have taken the area of assistive technology to new heights,

opening new doors, extending perspectives, and enabling autonomy for a number of people with disabilities" (Course, 2006, p. 35). "ICT has turned the planet into a worldwide village, with an ever-increasing possibility of accessing a good array of data and knowledge, equally making it possible for sharing of written, audio and visual information at real-time in many parts of the planet" (Usang, Archibong, Aji, Eyong, & Bassey, 2018). Teachers' use of assistive technologies "broadens the range of options and opportunities for students by facilitating greater access to their educational development, exposes students and teachers to equal opportunities, and helps to level the sector by increasing students' participation in economic and human development activities" (Amesi & Yellowe, 2018, p.29).

Attitude is the strongest force affecting the status of outstanding persons including persons with disabilities. According to Soetan et al. (2021), "Students' knowledge and attitude are essential for effective use of assistive technology within the education of scholars with education needs". Assistive technology helps to extend students' participation in their educational activities. Sanchal and Sharma (2017) stated that "attitude encompasses cognitive, effective, and behavioral reactions that individuals display towards an object or their feeling".

Gender is the range of characteristics concerning and differentiating between masculinity (male) and femininity (female). Soetan, Onojah, Alaka, and Aderogba (2020) established differences between male and feminine students' efficacy within the adoption of assistive technology for learning. Amosa and Obielodan (2019) deduced differences between the scholars taught using an interactive-video instructional package and their counterparts taught using the expository method. Their analysis established that the scholars taught using interactive-video instructional packages performed better than those students taught using expository. Van Deursen (2012) reported that boys perform better than girls on ICT-related assessments. Girls, however, are reported to be spending long hours on social networking sites, taking notes of music, and online reading than boys. Although it might be perceived by more folks that males adopt technologies more than the females in their learning because the females were generally slow in adapting to technologies, but this cannot be established unless investigated. Onojah, Abimbola, Obielodan, OLumorin, Aderogba, and Adeyanju (2019) established that there is no significant difference between male and feminine undergraduate students' readiness towards the adoption of study technology for learning.

The quest for pedagogical tools that can help break the barriers to meaningful teaching and learning is on the increase. To cross this hurdle, attention is now being shifted toward culturally responsive and contextually relevant approaches. The culturo-techno-contextual approach is one of such approach. Culture and society make each other. On account of this, society makes culture thereby allowing for its preservation and transmission from the past into the future by learning. Yared and Taha (2015) posit that culture is the subtotal of the material and immaterial tools, artworks, and works of art of a people and knowledge accumulated by the people. The people's knowledge, otherwise referred to as indigenous knowledge systems are perceived as "a conglomeration of thought systems or worldviews that have evolved among various local communities over a considerable length of time. It is the product of human reflection, creativity, and resourcefulness. It is the total of organised human interactions with nature and represented in various forms: verbal, graphic or written" (Ogunniyi, 2013).

ICT as a subject has a positive impact on life-long human development as well as national development. Therefore, the subject or course must be taught by qualified teachers who can guide students toward achieving the desired educational goal. Despite that, there is a decrease in students' positive attitudes towards science, science-based careers, and gender-related cases in secondary since its inclusion in the external examination from 2014 to date. Available chief examiners' reports of basic education certificate examinations (BECE) from May/June 2018 to 2021 revealed the persistent average performance of students in the subject. The lecture method of teaching is a teacher-centric method that promotes the supremacy of the teacher within the classroom setup. Here teachers followed the drill and rote method of memorization. In this lecture method, children learn through repetition and memorization. The poor method of teaching could be a result of the continuous use of the lecture method of teaching in the classroom (Marcellinus & Johnbosco, 2019).

The study intends to explore the potency of culturo-techno-contextual approach on students' attitude, and gender in computer studies, and their perception to the methodology. The research questions are as follows:

1. Is there statistically significant difference in the attitude and gender of students in computer studies taught using culturo-techno-contextual approach? and
2. What are the perceptions of students on the culturo-techno-contextual approach?

Attitude and Gender to Science

Attitude is defined as feelings, that can be either unfavorable or favorable, positive or negative, and are typically directed towards some specific object. Attitude implies a psychological construct that is inferred from responses to a given stimuli. There are six dimensions regarding attitudes: confidence, anxiety, value, enjoyment, motivation, and expectations (Sofiani, Maulida, Fadhillah & Sihite, 2017). Gender is always a status of separation between members of society. This is particularly evident in institutions like education.

The significance of investigating students' academic performance in relation to gender is based primarily on the socio-cultural differences between girls and boys. Some duties and work are believed to be attributed to boys only. For instance, engineering, arts and crafts work, agriculture among others. And professions like catering, typing, nursing are acclimatised for women. At times parents assigned domestic functions like car washing, grass cutting, bulbs fixing and climbing ladders to fix or remove some supposed duties from the boy child. In general, it is believed that any task that is demanding or complex in nature should be handled by the boys whereas less demanding or relatively easy task should be allocated to the girls. As a result of this arbitrary way of thinking and/or belief by the larger society, girls are seen as the weaker sex. Thus, an average Nigerian girl child goes to school with these fixed stereotypes (Dania, 2014).

Also, to promote students' optimistic attitude toward science is one of the important goals of teaching science. The results of the recruitment measurement are as significant as the intellectual magnitudes. Inappropriately, cognitive domain becomes the focus of the teachers in utmost cases. The interest and attitude of students for education is indeed the mastering of concepts. Majority

of the earlier researchers have shown the important association among attitudes toward performance of science. Their submissions suggest that students with positive attitudes achieve better learning outcomes (see Sofiani, at el., 2017).

Studies such as Taye, (2021) suggest that the post-secondary education sector is still plagued by its colonial and Apartheid legacies, lack of resources, skills flight and consequent staff shortages, lack of institutional independence from the typically centralised state, and curricula that are outdated and unresponsive to Africa needs and expectations (Potokri, 2016). In the 1980s, examining students' views on the importance of science studies revealed that middle and high school students exhibit a positive attitude towards the necessity and benefit of science studies (Yager, Yager, & Lim, 2006). However, more recent studies have indicated that this interest in the importance of science classes has severely diminished at these ages, most significantly in the transfer from middle to high school (Raved & Assaraf, 2011). Chowdhury & Mahavidyalaya, (2020). showed a diversion between the science subjects considered interesting and relevant by students and those taught in high school. But the 21st century science education is drawing more attention and many scholars focus on the issue about the attitude-gender relationship in science, but there is still no consistent conclusion (Çoban, & Korkmaz, 2021). Some research (e.g., Okorie., Nwankwo, Iwuala, & Okolie, 2023) has found that inequity is systemic in science-gender related matters in schools. According to Okorie at el. (2023), science-gender related in science education does not favour equity in the teaching and learning of science.

An individual's sense of themselves as a "STEM person" is largely formed through recognition feedback. Unfortunately, for marginal individuals who engage in STEM in formal and informal spaces, this recognition often adheres to long-standing exclusionary expectations of what STEM participation entails and established stereotypes of what it means to be a STEM person. However, caregivers and parents, who necessarily share cultural backgrounds, norms, and values with their children, can play an important role in identifying their children's interest and inclination towards STEM in ways that support children's authoring of their STEM identity in the face of these downgrading discourses. The outcome of Chaffee and Plante's (2022) research, found that though this phenomenon was recounted across parent profiles. Further to this, participants (parents) narratives also reflected differences in conversation content, context, and structure based on factors associated with STEM stereotypes, including gender, formal education or training in STEM, and parents' immigration experiences.

There is something intriguing and exciting about fun or humour in teaching learning contexts. This is Memory - Dopamine, a feel-good neurotransmitter, is released when having fun. When it is released, this leads to memory stimulation. According to McChesney's work, (2016), games can motivate students to take risks. Accordingly, students that have fun are more motivated to engage with the teaching and learning process. Generally, it is seen as an individual's ability to find things funny or their ability to make people laugh (Ruch, 1998). In the context of teaching and learning, it is 'anything that the teacher (lecturer) and/or students find funny or amusing' (Bakar & Mallan, 2022). Additionally, Lomax and Moosavi (2002) noted that "humour is a pedagogical method that can be used for engaging students and for fostering concept development" (p. 13). These definitions of humour suggest that it is used not only to make people (the lecturer

and/or students) laugh, but also to enhance students' learning in the classroom.

Drawing on the above, teachers may use humor to increase both engagement in the classroom and retention of content. In order to improve learning retention, humor needs to be related to content and be appropriate. Of course, cruel, sarcastic humor should not be employed. Related humor may be received positively by students and may increase engagement, but it has not proven to increase retention of the content (Gbeleyi, Awaah, Okebukola, Shabani, & Potokri, 2022).

THEORETICAL FRAMEWORK

The culturo-techno-contextual approach is a new methodology which was invented by Peter Okebukola in 2015. It is a method of teaching and learning science designed to break down many of the traditional barriers to science (Okebukola, 2019). The strength of culturo-techno-contextual approach is its combination of three concepts which are known to be important in the learning process, namely culture, technology, and context. Teaching from the cultural and contextual perspectives of the learner and tapping the power of technology to deliver instruction are innovative as a combination in a single teaching tool. Within the context of culturo-techno-contextual approach, the philosophical drive hinged on the works of Kwame Nkrumah's ethnophilosophy and Martin Heidegger's technophilosophy. Nkrumah's ethnophilosophy espouses knowledge rooted within the ethnic environs of people – Africa in this instance. The philosophy is reflective on the "culturo" and "contextual" dimensions of culturo-techno-contextual approach which admonishes teaching and learning based on ones' cultural background.

When culturo-techno-contextual approach is being implemented, students are engaged in activities which demand that they (a) draw on their topic-relevant indigenous (cultural) knowledge; (b) use technology to seek pre-lesson knowledge of the topic to be taught; (c) work in groups to share knowledge gleaned from their socio-cultural interactions and web-based resources; (d) draw on their prior knowledge of the topic when class is in session and (e) relate lesson examples to their local contexts. Given the five orientations of culturo-techno-contextual approach, some of the following stand out when the debate or inquiry is about learning beliefs of students. These are Orientations (a), (b), (c) and (e) of culturo-techno-contextual approach because they equally fit well with Vygosky's theory of social constructivism. Orientation (a) (d) and (e) relate well with Ausubel's theory.

DESIGN/PROCEDURE

A mixed-method design was adopted for data analysis. First, the study employed a survey design to elicit information from the students regarding how they find the topics in the new computer studies curriculum, why so, and suggestions for improvement. The survey had 1,501 junior secondary computer studies students (male=734, female=767) in Nigeria and Ghana. The schools were randomly selected. The topic ranked as one of the most difficult among the 19 concepts was "Logic Gate", this was selected for the second phase. The next phase included 213 junior secondary school students (equivalent of grade 8th grade) who at the time of the study had not taken the basic education certificate examinations (BECE) to ascertain the level of potency of the methods in question. Put differently, 80 (38%) of the participants are male and 133 (62%) are females. The teaching methods, culturo-techno-contextual approach, and lecture method were used to measure the performance and critical thinking skills of students in logic gate.

A pre-test and post-test consisting of the attitude questionnaire was administered

to all groups. Participants in the experimental groups were exposed to culturo-techno-contextual approach instruction, while the control group was exposed to the same content using the traditional method of teaching. Pre-lesson assignments were given on indigenous practices and internet resources related to the topic. The logic gate attitude questionnaire and the students' perception about culturo-techno-contextual approach interview guide (SIG) was the instruments developed for the study. These instruments whose reliability and validity exercises were conducted by experts in Africa Centre of Excellence for Innovative and Transformative Stem Education (ACEITSE), Science and Technology Education (STE) department of the Lagos State University (LASU), and two computer studies teachers with experience of over ten years teaching and marking of West African Examination Council (WAEC) and Basic Education Certificate Examinations (BECE) scripts. A respectable reliability coefficient of 0.78 was obtained. Data analysis was carried out using IBM SSPS version 23. The experimental and control classes were subjected to pre-test and post-test using the same instruments. The implementation of culturo-techno-contextual approach for teaching logic gate followed the five-step culturo-techno-contextual approach protocol:

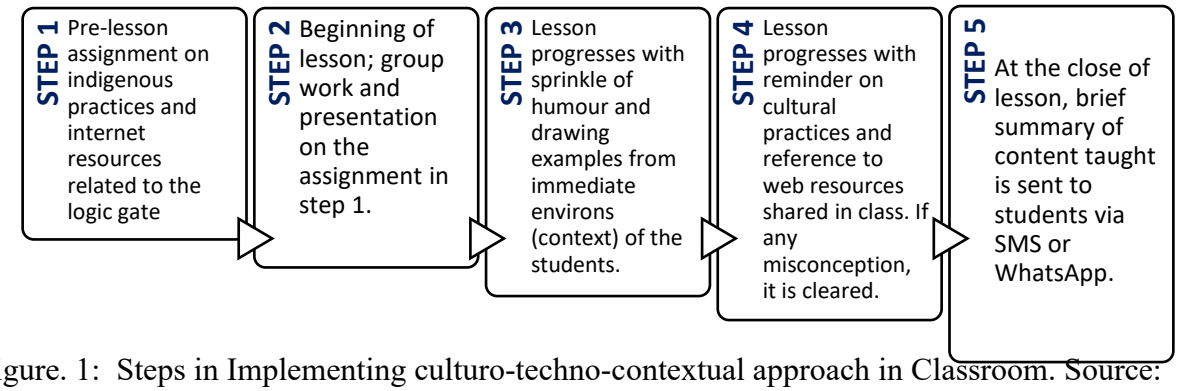


Figure. 1: Steps in Implementing culturo-techno-contextual approach in Classroom. Source: (Okebukola, 2020)

Interview guide

The logic gate computer studies interview guide was the instrument used to elicit responses from the participants who are from the randomly selected schools (public and private schools). The instrument was designed to obtain in-depth information about students' perception on the use of culturo-techno-contextual approach in the teaching and learning of logic gate. The instrument was developed to have two sections - Section A which sought demographic data of the students, and Section B which comprised three open-ended questions – to obtain the desired response on participants' perception about the culturo-techno-contextual approach. The instrument contained only three basic questions:

- List three reasons why you think the culturo-techno-contextual approach is a considerable method to be used in the class?
- Kindly explain why the cultural part of the culturo-techno-contextual approach is important?
- Suggest ways by which meaningful learning of concepts in computer studies can be made easy.

These questions were considered valid and appropriate after several practice sessions among the researchers. On account of proximity or accessibility, nine of the

participants were interviewed through phone call while five of them were interviewed face to face. In each case it took an average of seven to ten minutes to complete a session. The oral interviews were documented in form of audio clips.

ANALYSIS AND FINDINGS

A two-way ancova statistic was applied on the pre-test (as covariate) and post-test scores of the two groups on the attitude and gender items using the pretest scores as the covariate. The result shows no statistically significant difference on the attitude of students taught logic gate using the culturo-techno-contextual approach and lecture method [F (1, 210) = 2.18; p>.05].

Decision

The null hypothesis that states that there is no statistically significant difference in the attitude and gender of students taught logic gate using the culturo-techno-contextual approach and lecture method is not rejected (see table 1).

This result shows consistency with the findings from Turkish secondary school students' attitudes towards robotics and STEM that was examined in terms of gender and robotics experience (see Kucuk, & Sisman 2020). Accordingly, results showed that the students' attitudes towards robotics and STEM were positive. Gender had no effect on STEM attitudes. However, in terms of robotics attitudes, female students had significantly less desire and less confidence to learn robotics than male students. There was no gender effect on computational thinking and teamwork. Implications were discussed in terms of theoretical insights, practices for educational robotics in STEM, and directions for further research.

Table 1: Tests of Between-Subjects Effects

Dependent Variable: Post Attitude Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	43.28[a]	2	21.64	1.71	.18
Intercept	2679.98	1	2679.98	212.32	.00
Pre_Attit	16.16	1	16.16	1.28	.26
Gender	27.49	1	27.49	2.18	.14
Error	2650.70	210	12.62		
Total	142040.00	213			
Corrected Total	2693.97	212			

a. R Squared = .016 (Adjusted R Squared = .007)

Also, in exploring the attitude and interest in the gender stereotypes, Suwono, et. al., (2019 p. 012079) revealed "that male has a more positive belief in the most of STEM field, such as technology, engineering, mathematics, and STEM, rather than female". Further argued, these authors said that the emerging trends in STEM from their data suggest that both male and female have interest in the social field and medicine. However, the additional interest of male and female was significantly different in males. In this study we found that both male and female students have interest in computer science, however, their individual interest signals their attitude about the learning of

computer science as a subject. This thus indicates that students with higher interest or passion for a subject are more likely to put up a more positive attitude towards learning a subject like computer studies. This study also disclosed that the factors, namely family support, family finance, friends, teachers, and hobbies of students, determined both attitude and interest in STEM among students.

Table 2: Selections of Interview on Students' Perception on the Use of culturo-techno-contextual approach

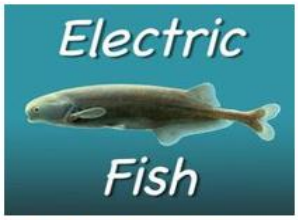
Pseudo Name	Note all data are reported unedited
Lolui	'The CTCA has helped me understand concepts such as truth table and logic inputs variables which initially seemed difficult prior to the class and I think this method will go a long way in developing students in the near future.
Azuu	'I was able to relate the concepts in logic gate to my day-to-day activities due to the cultural examples and this made things easier'.
Esormar	'Sir the teaching really helped a lot and it made us realise my potential as it helped me study ahead of the class. We are grateful for this help and I like the teaching method. Thank you, sir'.
Odoi	'The use of cultural examples made it easier for me to relate to the topic'.

Figure 2: Indigenous Knowledge illustrations used in Teaching of Logic Gate. (Source, Gbeleyi, 2022)


The Door Lock Handle "Owo Ilekun"


Fitila


Farm Layout "Ifilele Oko"



The Electric Fish "Eja Ojiji"


Koko

The School gate


Mimosa Pudica 'Sensitive Leave', Ewe Padimo.

Examples of indigenous knowledge related and found applicable to the teaching of logic gate includes eja ojiji "electric fish", serial and parallel arrangement of weeds or crops on the farmland, marble stones ''ako okuta" to spark fire in burning weeds, mimosa pudica "ewe padimo", "ogusho" to light or ignite fire in the absence of kerosene, petrol or gas, and the suwe game played by the students in secondary schools. All these are what are used in comparison with the modern technology or electricity effect of the logic gate.

In a study conducted by Ademola (2022) on the impact of culturo-techno-contextual approach (CTCA) and flipped learning on retention, problem-solving skills and attitude of secondary school students in

nuclear chemistry using a mixed method research approach, where quasi experimental research design was employed. The study which was of two phases namely survey of difficult concepts in computer studies and experimental identified difficult concepts in chemistry curriculum and the result of the survey phase being the second phrase showed that revealed logic gate, problem-solving skills, and machine language was among the first three computer studies concepts students found very difficult to learn and understand. The experimental phase had three groups, two experimental and a control. The first experimental group was taught using culturo-techno-contextual approach (CTCA) as treatment and the second experimental group was taught using the flipped method of teaching while the control group was exposed to the conventional lecture method. There were 69 students in the CTCA group (male = 28, female = 41), 54 students in the flip group (male = 25, female = 29) and 59 students in the lecture group (male = 26, female = 33).

The result obtained from the one-way mancova statistics result shows that there is a statistically significant difference in method of teaching through the multivariate F (Pillai's Trace) [$F=56.08$; $p<0.05$]. However, statistical significance difference was found on the univariate mancova on retention [$F(2,177) = 215.95$; $p>0.05$] and problem-solving skills [$F(2,177) = 11.29$; $p>0.05$]. The significant differences found in retention and problem-solving skills were in favour of CTCA group (mean = 23.77 and 11.03) respectively. For the flipped group, (mean = 12.11 and 10.73) respectively while the lecture group (mean = 10.70 and 9.11) respectively. The null hypothesis which states that there will be no statistically significant difference in retention and problem-solving skills of students taught using CTCA, flip learning and lecture method is hereby rejected since significant difference was found.

This result implies that CTCA is a method that can break down barriers to learning. Despite, the students (participants) being pre-informed of what to be taught ahead of time, this study reveals and thus suggest that CTCA encourage students to make use of the internet facilities for enquiry about the concept(s) to be learned ahead of time. This contradicts some general assumptions that students use their phones for irrelevant things such as watching porn or non-educative things. Interestingly, CTCA takes into consideration these assumptions. The good and positive use of phones by students, suggest that students are kept busy and can determine what to learn. Therefore, they have access to different learning sources and as well to many as possible elderly person about the indigenous knowledge that is related to the concepts that they are learning.

CONCLUSION

This study aimed at recommending the effectiveness of the use of culturo-techno-contextual approach in teaching and learning computer studies difficult concepts in secondary school in Nigeria. It contributes valuable insight and does have implications for teaching, learning, and researching computer studies education. The study clearly addresses, and has implications for, equity issues related to computer studies goal of helping all learners achieve science literacy, including, but not limited to, race, sex, gender expression, ethnicity, socioeconomic status, access, ability, sexual orientation, language, national origin, and/or religion.

The study revealed that there was no significant difference between students taught logic gate and their counterparts who were taught with the lecture method. Based on the findings of this study and within its limitations, we infer that there should be further probe of the methodology since

evidence has shown its impacts on other studies.

To achieve the intended quality computer science education, there is an urgent need to integrate the use of new technologies of instruction into the educational system. Among the numerous modern technologies of instruction available today is computer simulation. The use of technology to enhance learning does not only perfectly meet the needs and nature of today's learners but also serves as a prerequisite for tomorrow's world of work.

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Authors' Contributions

OAG collected all the data and conducted the analysis, wrote the literature review, methodology, results and the first draft of the article. OCP wrote most of the discussion, wrote part of the literature review and the methodology, and revised drafts of the article.

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Gendered Spaces: Students' Experiences of the Social School Spaces in High Schools in Hhohho Region, Eswatini

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ABSTRACT

This article makes a social constructionist exploration of student experiences of gendered social school spaces in high schools in the Hhohho region, Eswatini. The study utilsed a qualitative narrative inquiry methodology. Individual and focus group semi structured interviews were used to generate data. The participants were 24 purposively selected students (12 boys and 12 girls) from four high schools in Hhohho region. Participants ranged in age from 16 to 18 years of age. Boys and girls experienced the school's social spaces differently. The social school environments had an impact on the students' academic performance. The teachers' poor treatment of the students, according to the students' complaints, caused them to despise school. They griped about the numerous strict regulations that teachers upheld. The students proposed that teachers should relax their strict restrictions and give the students more autonomy so that the social school spaces would be more responsive, particularly in terms of relationships with teachers. According to the social constructionism theory that guides this study, societal and interpersonal influences shape how people live their lives (Gergen, 1985). The relationships students establish with teachers are what make their lives meaningful.

Keywords: Social Constructionism, Bullying, Masculinity and Femininity

INTRODUCTION

The article examines four urban high school students' narratives of gendered spaces against the backdrop of significant gender disparities in Eswatini's high schools. Alzeer (2016, p. 5) claims that spaces are gendered when they are "made for and associated with one certain gender." Savard (2016, p. 10) defined gendered spaces as settings where "clearly masculine and female behaviours occur." Instead of judging men/boys and women/girls by their inherent nature, a gendered space judges men/boys and women/girls based on their conduct. According to Savard, gendered places decide whether actions taken there are regarded masculine or feminine based on the socially acceptable behaviour for men, boys, and women, respectively. According to Massey (2005), gendered spaces represent a complex and nuanced relationship between place and gender. This article examines four high schools in Eswatini's Hhohho region against the backdrop of the patriarchal society of the Eswatini people to offer a sociological view into what it means to be a girl or boy. It looks at how gendered spaces affect boys and girls as they move through educational settings. By highlighting both girls and boys as a social group that is specifically touched by the intricate and persistent dimensions of gender myths and stereotypes as they occupy the gendered spaces, the purpose is to contribute to ongoing gender discussions.

THEORETICAL FRAMEWORK

In social constructionism, gender is "created and re-constructed out of human interactions, out of social life, and it is the texture and order of that social life," according to Lorber (1994, p. 54). According to human genitalia (Lorber, 1994), feminine and masculine identities are based on cultural ideologies and represent socially constructed views of what it means to be a girl or a boy in a specific culture and context, respectively (Berger & Luckmann, 1991). However, feminine identities are based on cultural ideologies and reflect socially constructed views of what it means to be a girl in a particular culture and setting (West & Zimmerman, 2009). In addition to social context, structural contexts for gender constructions, performances, and experiences are provided by children's gendered experiences (Chowdhury, 2017). Due to its tendency to promote masculinities while subserviently placing girls, social constructionism offers analytical insights into the intricate processes of gendered spaces and gendered experiences of children (Pitikoe & Morojele, 2017). As a result, this study focused on the students' gendered experiences of the social school spaces in high schools.

RESEARCH DESIGN

A narrative inquiry design was used in this study. The researcher employed narrative inquiry to gather participants' accounts (narratives) about their experiences with phenomena (Cowger and Tritz, 2019). Due to the contextual variables affecting space and the gendered experiences of students in these four high schools, narratives proved useful in this study for capturing the subjective voices of the participants. It was also employed to discuss the significance of the participants' own life experiences (Cresswell, 2016).

GEOGRAPHICAL AND SOCIO-ECONOMIC CONTEXT OF THE STUDY

This research was conducted in four high schools in Eswatini's Hhohho region. With the exception of the east, where it borders Mozambique, Eswatini, officially the Kingdom of Eswatini (formerly known as Swaziland) and also known as kaNgwane, is an independent country that borders South Africa and Mozambique. The people of Eswatini share a common language and uphold a traditional, static way of life based on patriarchy and Christianity (Fielding-Miller et al. 2016). The country is divided into four geographically separate regions: Manzini, Hhohho, Shiselweni, and Lubombo. The study was conducted in the Hhohho area, which is home to Mbabane as its capital. The study selected coeducational schools situated in and around Mbabane, the capital city.

STUDY METHODOLOGY AND DATA COLLECTION METHODS

A qualitative narrative approach served as the foundation for the study's methodological framework. Aspers (2019) states that, in qualitative research, a small distinct group of participants is generally examined to gain an in-depth understanding of the topic, hence a research sample of 24 participants was sufficient. 24 students from four high schools in Form 5 (12 boys and 12 girls), all of whom were between the ages of 16 and 18, participated in the study. Face-to-face individual interviews and focus group discussions were used to collect data. Focus groups helped with "data triangulation" by enabling the researcher to confirm the remarks made by students in one-on-one interviews (Winslow, Honein and Elzubeir 2002, p. 566). The researcher encouraged the participants to speak freely, naturally, and openly. As a result, questions were asked, and answers were given in response to the

remarks made. Each participant was given the chance to respond to the topics and issues raised while taking into account group dynamics. On average, at each research site, the researcher spoke with one participant. Neuman (2014) affirms that conducting individual interviews with participants enable them to express their thoughts and open up to thorough study, particularly when it comes to personal accounts of their feelings and experiences. The researcher recorded the conversations on tape and taking brief notes as the data was being generated. Participants communicated in both SiSwati and English.

DATA ANALYSIS PROCEDURE

In this study, thematic analysis was employed. According to Braun and Clarke (2006), thematic analysis is a systematic process used to classify, analyze, and summarize data in a thorough manner with little organization. Semi-structured focus group interviews and individual interviews were the main instruments used in the researcher's active participation in data gathering. The researcher listened to the audio recordings again and studied the texts in order to classify and categorise the concerns and ideas that were emerging. He repeatedly listened to the voice recordings as he typed out the interviews. The researcher's ability to comprehend the data and make sense of the meanings and patterns that surfaced was assisted by this interaction with the data. From written categories, themes emerged, organize, and link to the study.

ETHICAL CONSIDERATIONS

Ethical considerations were observed in order to respect the participants' rights (Creswell 2014). The Ministry of Education and Training in Eswatini was approached for permission through the Education Director's office. A written consent from the school principals was also secured via a written letter describing the study's goal. Following that, parents and participants received letters of consent outlining the issues of confidentiality, privacy, and voluntary involvement. The participants had a choice to participate, not participate or stop participating in the research without any penalties for such an action. For the sake of anonymity, pseudonyms have been employed to represent both the schools and the participants in this study. The ethical clearance was granted for this study by the university's ethical clearance committee.

FINDINGS AND DISCUSSIONS

The social school space has a significant impact on how children experience gender and geography. The social school environment, according to FAWE (2018), is comprised of all interactions between students and teachers, students and other students, boys and girls, boys and boys, girls and girls, and school administration and teachers. The students talked about their interactions with the teachers, as well as boy-boy and boy-girl relationships, and how these may be made more gender-responsive.

Lily (focus group) from site A mentioned:

> *Teachers should stop the habit of constantly making up their own rules. They have to stop this dressing down or putting students down and giving out punishments when they are having bad days. The principal should allow us students to write in a suggestion box about how we feel about teachers. It disturbs our learning.*

Celiwe (individual interview) at site C corroborated:

> *Our teachers should be friendly to us as this will help us to work peacefully with them and make us pass. This obsession with power annoys. School ends up boring. Good relations between teacher and learner*

are important. There are too many rules enforced by teachers. They should reduce them, for example, what effect does my hair style have on my academic performance? Few rules and allow us to make some independent decisions.

Musa (focus group) from site D commented:

Rules in our school especially by teachers are too much and of course strict. We have no freedom; we will end rebelling. Teachers should be worried about drug abuse and gender violence not getting worried about our hair styles. School sucks. Teachers should reduce the rules and regulations and focus on bigger problems that the school is going through.

An almost similar response came from Bruce (focus group) from site B:

School is painful thing for me. Yes, school is fun at times, but most of the time it is these group of teachers pushing us around because they have so much unrestrained power. Abasebentise emandla abo kancane (translated as let them use their power sparingly).

From submissions made, both boys and girls spoke out against what they considered minor and irrelevant regulations and rules by teachers meant to control and constrain their behaviour. In this light, school was seen as an unwanted imposition of authority and control that had little to do with fostering effective teaching and learning circumstances. The learners appealed for the removal of the many unnecessary rules and regulations for them to enjoy school. The findings are supported by Alnasseri (2014) in her study of student –teacher relationship in Oman, that removal of unnecessary rules by teachers and presence of trust, support and respect in the school environment improves children's learning. Learners feel free to ask questions and disclose what they did not understand without fear if their relationship with teachers is uniquely warm. According to social constructionism, reality is socially defined, but this reality relates to the subjective experience of daily life and how the world is interpreted rather than the objective fact of the natural world (Schwandt, 2003). As such, the reality of these learners relates to their subjective experience of daily life within the school spaces.

Regarding relationships amongst learners themselves, learners made several submissions.

Boys' social relations and masculinities

The study revealed that boys have to act violently as a way of asserting their masculinity within the school spaces. Boys are depressed because of the bullying that they have to endure most of the times from other boys. The boys feel neglected with no support coming from guidance and counselling department in schools as they feel it only caters for girls. Boys end up acting violently and angrily towards others as a way of dealing with the bullying. This study also revealed that boys within the school spaces provoke each other as a way of testing each other's strength. Those who show signs of weakness are the ones who continue to be abused more. The study found that, the boys abused by other boys' requests the intervention of the school administration to intervene with strict policies to curb the occurrence of these activities. These findings are reflected in the responses given by the participants.

Ayden (focus group) from site A highlighted:

Being a boy means you have to act macho, otherwise you will always get this junk treatment or crap

> *treatment from other boys. Boys do not have ways of dealing with problems because we have nowhere to let out our emotions. We have no one to share our issues with. I go through depression and the only way to deal with it is for me to get angry and often offend other people and become mean to them. Guidance and counselling pays more attention to girls. That should change and focus on boys as well.*

Ayden's response is important in that he associates acting macho with gender-based harassment, and inability to deal with his emotions. He highlighted that there is need to get emotional support, the lack of which is linked to depression. The need for guidance and counselling to focus also more on boys is noted, so that they benefit from it to deal with their problems (Chambers, Tincknell, and Van Loon, 2004; Heyden, 2011; Lai-Yeung, 2014).

Another participant also indicated how boys do surveillance of peers' masculinity, centering on the body, physical strength and the weight of the body. Bullying, happens among the boys. The bullying took place without any provocation. This could be regarded as an attention seeking behaviour and also a claim to occupation of space.

Banele (individual interview) at site B mentioned:

> *Boys have to deal with an issue of the strength they have. As boys, we can just start pushing one another without any justifiable reason and if you indicate that you are injured, upset or hurt by what have been done to you, we will continue doing until you fight back. If you show that you weak, you will be called abusive names. This is stressful and I would like the administrators to put strict policies to stop this abuse that we boys put on each other. We want school to be interesting but the stress of the verbal and physical abuse is too much.*

Another boy mentions the increased pressure exerted on boys to have sex with girls. Lwazi (focus group) at site D commented:

> *It's an interesting thing to have girls at school. You can easily get chicks at school if you are a handsome dude. However, there is pressure that you do more with a chick. For example, kissing alone is seen as not doing enough so you are expected to go beyond it. Some immature guys bow down to this pressure and regret later because of the consequences. This is all because as boys we do not get proper advice while in school. We need more than the guidance and counselling sessions in schools.*

The emphasis here is the expectations of normalising certain behaviours that are constructed into the expectations of boys' behaviour within the school spaces and the peer group's role in the social masculinity practices (Martino and Kehler, 2005). The emphasis also is on proving oneself through displaying masculinity and ability to attract girls if you are handsome, which appear to be requirements for displaying masculinity successfully. Failure to succeed in these, results in risking being subjected to homophobic harassment. Having an atmosphere with drug use may result in violence and failure on part of the users and those affected. This shows that human lives are made through how people interact with one another. The Eswatini Education Sector Policy (2018)

makes it plain that the school spaces should be free from drugs and alcohol as a way of promoting gender-responsive school spaces. Reality is defined by individuals and groups according to social constructionism (Steedman, 2000). As such, the narratives of the learners is their lived realties.

Girls' social relations and femininities

The study revealed that the girls' bodies, their sexuality, and their appearance, were of major concern to their lives. Slim bodies and being pretty conferred a femininity status and carried a social currency. The monitoring of sexual identity and femininities played a vital role in girls' peer group relations and impacted on the quality of their school lives. Martino and Kehler (2005) aver that the body and appearance are a major concern in the lives of girls. Hence, if they are body shamed and called names, this would negatively impact their schooling lives and make the school spaces an unwelcome environment for them to achieve their highest possible potential. Thus, some girls had comments to make.

Ndumo (focus group) at site D asserted:

> *Some girls want to live up to the standards of boys and ending being fake. They do things to get approved by boys. This makes girls subordinate to boys. Girls need to be empowered through all possible ways so that they live for themselves and stop to be intimidated by boys Girls clubs should be made strong in schools. Girls lose their personality since they are cornered to get boys approval. They get rewarded for conforming to being female and being sexually desirable for boys.*

The point that Ndumo makes is important regarding boys' power to intimidate. Boys use their power in intimidating girls and policing girls' sexuality and femininities. Schools need to upgrade their girl empowerment programs to ensure that girls stand up for themselves. Jones, Moss and Tomlinson (2014) noted that, instead of defining girls according to their potentialities, doing so according to sexuality is a sure way of subordinating them to boys.

Gabi (focus group) at site C mentioned:

> *Boys think that they are superior to girls and think they can dictate as to what girls should look like, do and what not to do. If you do not fit in their image, then they start calling you names. This disturbs our social lives and have an impact on our school lives. Schools should be looking into these issues seriously.*

From the narrative, it seems boys have a tendency of surveillance on girls. Body image is connected to the wider issues of how to gain social acceptance for girls by boys. Name calling should not form part of childhood. Children should be taught that words hurt just as much as being hit physically. Calling names carries far into adulthood (Slaatten, Hetland, and Anderssen, 2015). Name calling thus has a negative impact on girls schooling lives. As children interact socially, they reflect the negative judgements they have been told or observed, and if left unchecked, these beliefs can be the basis for life-long prejudices (Brynes, 1998). There is a clarion call for school authorities to look at the issue of name calling by boys, to make school spaces gender-friendly, as enshrined in the Eswatini Education Sector Policy (2018). The social constructionism perspective states that as learners and groups interact together in a society and over time, they form mental representations and concepts about each other's actions. These

concepts or mental representations created through name calling, finally become adopted into shared roles utilised by learners as they relate with each other (Cojacaru, 2010). It might be claimed that responsible education authorities should embrace a pedagogy of difference as a foundation for building gender and school-based reform agendas based on the learners' narratives of their schooling experiences. Learners' voices can be a great source of information about the impact and effects of power relations between boys and girls as they engage with schooling, as seen above. Social constructionism's emphasis on social relations is a foundation on which learners' behaviours are constructed and their lived realities established (Gergen, 2009).

CONCLUSIONS

Schools' social spaces should be free from minor and irrelevant regulations and rules by teachers meant to control and constrain the behaviour of leaners. In this light, school could be seen as an unwanted imposition of authority and control that had little to do with fostering effective teaching and learning circumstances. The learners appealed for the removal of the many unnecessary rules and regulations for them to enjoy school. In order to address the negative effects of suppressed emotions by the male child, there is need for programs that address boys' immediate needs, as well as help them respect and care for themselves and their female counterparts. As children interact socially, they reflect the negative judgements they have been told or observed, and if left unchecked, these beliefs can be the basis for life-long prejudices (Brynes, 1998). There is a clarion call for school authorities to look at the issue of name calling by boys, to make school spaces gender-friendly, as enshrined in the Eswatini Education Sector Policy (2018).

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Teachers' Perceptions and Experiences of Teaching Accounting

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ABSTRACT

Large classes have a potential to stir a challenge for both developed and developing countries in their effort to deal with diversity that comes with learners' diverse abilities. The purpose of the study was to explore Grade 12 teachers' perceptions and experiences of teaching Accounting in large classes in Manzini region, Eswatini. The study used purposive sampling. The data collection instruments were questionnaires, personal observations, and semi-structured interviews. Qualitative data was analysed thematically, while descriptive statistics computed for quantitative data. The study revealed that the majority accounting teachers were not contented with their class sizes as they faced several challenges when teaching accounting in large classes. Teachers agreed that evaluating work from group learning was necessary, but they used different approaches for assessment. This study presents insight into what secondary school Accounting teachers in emerging economies experienced with teaching Accounting in large classes, and the need to reflect on instructional practices.

Keywords: Teaching, Accounting; large classes; Grade 12 teachers; viewpoints; Eswatini

INTRODUCTION

Eswatini has considered it necessary to adjust its education system to suit the local needs of the learners and this incorporates the teaching of Accounting in its broad curriculum (Bhebhe & Nxumalo, 2017). The manner in which the Accounting curriculum is designed is such that it focuses on the learner and the teacher's role is to enable learning (Tshiovhe, Monobe, & Mulaudzi, 2018). The declaration by the Ministry of Education in Eswatini to have all learners, irrespective of ability or disability, admitted to the nearest community school led to a sudden increase in schools' enrolment figures with a resultant increase in class sizes (Thwala, 2015). The current policy to drift towards massification of education manifests as large classes, and this poses a problem for quality education with a substantial effect on the country's socio-economic development (Hornsby & Osman, 2014). A large class size is one which is perceived by the educator educating it or the learners learning in it to be large (Shamim & Coleman, 2018). At school level, a large class may consist of 50 or more learners. A teacher must be adequately skilful with engaging tasks in the classroom(Cruz & Rodriguez, 2015). Large classes have a potential to generate a challenge for both developed and developing countries in their effort to deal with diversity that comes with different learners' diverse abilities, and the problem of instilling higher order thinking skills while promoting learner participation in the process. In real terms, large classes have become one of the main obstacles to the achievement of quality education (Foley & Masingila, 2014). It is against this background that considered it necessary to explore the essence of teaching Grade 12 Accounting in large classes in Eswatini. The reason for the choice of Grade 12 as a focus Grade is that it is through this Grade's

final end-of-year results that teaching efficacy gets measured; hence, Grade 12 teachers can introspectively reflect on what it is like to teach Accounting in overcrowded classrooms.

The purpose of the study was to explore Grade 12 teachers' perceptions and experiences of teaching Accounting in large classes in Manzini region, Eswatini. The research objectives were formulated as follows: To explore teachers' perceptions and experiences of what it is like to teach accounting in large classes. To explore teachers' perceptions and experiences of what makes teaching accounting in a large class a success. The research was conducted to provide evidence as to whether large classes contribute to poor teaching efficiency.

THEORETICAL FRAMEWORK

Theoretically this study was based on Social Learning theories by Albert Bandura and Socialcultural learning (Constructivism) theory by Lev Vygotsky. In the social cognitive theory, the student is seen as thoroughly integrated with the environment within which he or she is learning, and the student's cognitive responses, behaviours and environment all work together to create learning. Students observe models and build self- efficacy. Learners belief that they can accomplish the work modelled (Bandura, 1986). Bandura (1997) states that if a learning behavior has been reinforced in the past, to be displayed, the student must believe in the value of this behavior. In the constructivist framework learners actively construct knowledge and learn from each other. Rote memorisation and repetitive learning are discouraged. Teachers engage students in the learning process and assist as well as guide students if tasks are difficult to build confidence and develop new skills. Student-centred approach dominates. Learners show positive moral towards their friends such as cooperative, respectful, responsible and helpful (Chen, 2012; Brau, 2018 and Andiansyah & Ujihanti, 2018).

Empirical Literature Review

Literature in support of a relationship between class size and teaching efficiency or performance

The Sub-Saharan African countries are faced with large classes which affect the education process. A large class is one of the main obstacles to achieving quality education (Foley & Masingila, 2014). Blatchford (2011) found that the teaching and learning process will be affected if there are numerous learners in a class owing to reduced time for educational interactions. Promoting effective teaching and learning requires more resources and facilities in the form of classrooms and learning equipment should be provided (Yelkpieri, Esia-Donkoh, & Ofosu-Dwamen, 2012). Larger classes reduce the level of communication between individual learners and teachers and creates stress in teachers as they try to manage the class, and this affect their performance negatively (Mamman, Chadi, & Jirgi, 2015). According to Kewaze and Welch (2013) class size has an influence on teaching styles. Blatchford (2011) agreed that teachers might change their style of teaching when faced with large classes. A study by Cakmak (2009) found that class size and teaching method are related and that managing large classes is always more challenging than managing small classes. Shamim and Coleman (2018) found that teachers in large classes used less learner-involving activities in their classes compared to teachers who had smaller classes.

Literature in denial of a relationship between class size and teaching efficiency or performance

Lecturers in a study conducted by Yelkpieri et al. (2012) are not in agreement with the claim that large classes influence the quality of the teaching and learning process. Harfitt (2012) suggested that when

the number of learner's changes, class teachers hardly use a different teaching strategy to accommodate such a change. A study by Bedard and Kuhn (2008) on the performance of an instructor in a large class based on student evaluations in an Economics class, found that class size had no impact on the teaching performance of an instructor. Cheng (2011) found that the number of learners in a class is an insignificant issue in influencing performance in quantitative and theoretical subjects and showed that learners' efforts and teacher quality are the primary determinants of performance efficiency.

Teachers' perceptions and experiences of teaching large classes

Blatchford (2011) examined how learners engaged themselves and teacher-pupil interaction in large classes and found that in secondary schools there was negligible evidence of anti-social behaviour in large classes for learners performing above average. On the other hand, slow learners in large classes showed some negative behaviour. They also found that the size of a class had a significant effect on active teacher-learner interaction, the higher were the number of learners in a given class, and the less likely there would be active interaction between the teacher and the learners. Kewaze and Welch (2013) interviewed teachers where all of them revealed that large classes made it difficult for a teacher to give helpful feedback to individual learners. Schiming (2013) observed that learners in overcrowded classrooms struggled to acquire higher-order academic skills such as problem solving, written expressions and critical thinking than their counterparts that were in smaller classes. The most difficult aspect of teaching a large class is motivation as it is alleged by teachers that it is easier to motivate a smaller class than a bigger class as each learner is motivated differently (Cakmak, 2009).

METHODOLOGY

Research Design and Paradigm

The study adopted qualitative research design. According to Cresswell and Cresswell (2018), qualitative research is exploring and understanding the meaning individuals or groups ascribe to a social human problem. Descriptive statistics was employed for illustrative purposes. Therefore, the study is located in a constructivist- interpretive paradigm.

Research Sampling

For the quantitative component of the study, sampling was non-random and purposeful where twenty-five participants with lived experience of teaching Grade 12 Accounting in large classes were purposefully selected from schools in the Manzini region. This allowed the researcher to circulate the questionnaire to all teachers who have had the experience of teaching Grade 12 Accounting in large classes.

For the qualitative component, a purposive sample was also used in phenomenology. Experienced ten participants from ten other schools who were not part of the quantitative_sample were selected with the aim of gaining in-depth understanding of the phenomenon. Five of these schools are in the rural settings while the other five are in the urban area, and the purpose for this was to allow the sample to be a true representation of the target population in terms of typical attributes (De Vos, Strydom, Fouche′, & Delport, 2011).

Data Collection and Analysis

Data were collected and captured for analysis from sampled specialist accounting teachers with the qualifying large class size of 30 or more learners.

Survey

The teacher survey questionnaires that were based on a five-point Likert scale

with closed-ended and open-ended questions to enable the collection of quantitative data, were first pilot-tested with accounting teachers from two secondary schools that were not included in the sample in the Manzini region, for both content and construct validity. This first sampled group served as a pilot study to confirm whether the questions and the language used in the questionnaire was unambiguous for the questionnaire to serve as a data-gathering tool. After piloting, it was then circulated among the target population. Descriptive statistics instruments were generated from the questionnaires.

Observations and Interviews

The first instrument used for the collection and analysis of qualitative data was the observation schedule with several items that guided the researcher on what needed to be observed such as: Describe the general classroom set-up in the classroom **(**What is the teacher doing? What are the learners doing?) What is the current class size? Does class size play any role in teaching style? How do I differentiate? Are there any visible challenges and constraints directly linked to class size? Are there any clear advantages resulting from class size? Each lesson and thematic analysis guided the analysis of the observation transcript in identifying, analysing, and reporting patterns (themes) within the data (Braun & Clarke, 2006). Direct observations were conducted owing to the need to observe and record the events relating to the interaction between the teachers and learners as captured in both rural and urban schools.

The researcher then administered face-to-face interviews that were voice-recorded with participants' permission, with questions such as: What is your Accounting class size? Would you classify your class as large or small, and why? Does the teaching process normally run well in a class of this size? Why do you think so? Was the lesson intellectually stimulating given the class size? How do you think the feedback you received from the learners was affected by the large class size? What is the teaching method you use in your class? Was the teaching method appropriate for the large class? Would you use the same strategy if you were teaching a class of a relatively small class? How did you assess learners to ascertain whether the lesson objectives were achieved or not? How do you cope on giving timely feedback to your class? What are your viewpoints about teaching Accounting in a large class? and thematic analysis was used to analyse interview transcripts that emerged. Pseudonyms were used in the process of data presentation.

Trustworthiness

Member checks (supervisors' and research cohort academics) were used to assess the questionnaire and interview questions to enhance content validity while multiple methods of data gathering were used to maximize validity in the findings (triangulation), and three accounting teachers and three other field experts were consulted for internal validity. Permission was obtained from the higher education institution.

Ethical Considerations

Permission to conduct the study was obtained from the Higher Education Institution research ethics committee, ethical clearance HSS/0076/016M. Teachers signed informed consent and assured of confidentiality and utilisation of pseudonyms. Gatekeeper's letter was obtained from Eswatini Ministry of Education.

Research Results

Quantitative results

Demographic Information

A brief profile of the sample indicated that thirteen teachers were drawn from urban schools and twelve from rural schools where fifteen of these were males and ten were females. Eleven of these teachers had a teaching diploma, while thirteen had a bachelor's degree with a

teaching qualification and one had a master's degree with a teaching qualification. Seven of the teachers had a teaching experience of one to five years, while six had an experience ranging from six to ten years, four had eleven to fifteen years of experience, three had sixteen to twenty years and five had twenty-one to twenty-five years teaching experience.

Table 1: Demographic Characteristics of Respondents

Features and descriptions	Teachers (25)	
	Count	Percentage
Gender		
Male	15	60%
Female	10	40%
Schools		
Urban	13	52%
Rural	12	48%
Qualifications		
Teacher's diploma	11	44%
Bachelor's degree plus diploma	13	52%
Master's degree	1	4%
Teaching experience		
1-5 years	7	28%
6-10 years	6	24%
11-15 years	4	16%
16-20 years	3	12%
21-25 years	5	20%

Teachers' views regarding the large class size

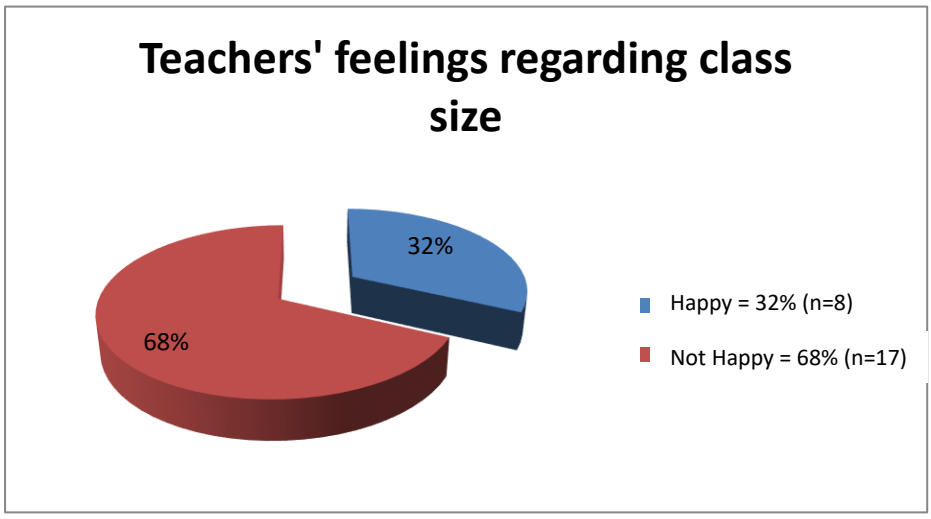

Figure 1: Teachers' viewpoints regarding the large size of the class

Figure 1 above indicates how participants (N=25) felt about teaching Accounting in a large class, where 68% (n=17) of the participants were not happy about the size of the class and 32% (n=8) of the participants were happy about teaching Accounting in a large class. The decision to refer to being 'happy/not happy' as an indicator of how teachers felt about teaching Accounting in large class-sizes was motivated by the desire for authors to capture teachers' viewpoints of approval or disapproval of the large size of the class in which they taught the subject. Table 2 above depicts responses from the teachers who were happy with their class sizes

(n=15) at the complete exclusion of those who were not happy to teach Accounting in large classes. The responses were categorised according to the frequency of appearance. 27 % (n=4) of the teachers were happy particularly because it is easy to identify learners who need assistance and easy to manage the class, 20% (n=3) enjoy the challenges of a big class, and 13% (n=2) of the teachers believed that large classes enabled group work to flow.

Reasons participants were happy with the large class size.

Table 2: Reasons participants were happy with the large class size.

Reasons	Frequency	Percentage
Easy to identify learners who need assistance.	4	27%
Easy to manage the class.	4	27%
Enjoys the challenges of a big class (Different learner capabilities).	3	20%
Enables group work to flow.	2	13%
Able to mark and give timely feedback.	1	7%
Slow learners are able to get help from those performing well	1	7%

Reasons participants were not happy with the large class size.

Table 3: Reasons participants were not happy with the large class size.

Reasons	Frequency	Percentage
Difficulty with which individual attention can be given to individual learners	11	31%
Difficulty with which a large class can be managed	6	17%
A lot of marking	5	14%
Difficult to give as many practice exercises as possible	4	11%
Difficult to give immediate feedback	2	6%
Too much differences in learner capabilities	2	6%
Less participation from shy learners	2	6%
Difficult to monitor learners – learners copy from each other	2	6%
Moving around the classroom becomes a challenge (no space)	1	3%
The lessons become teacher centered	1	3%

Table 3 depicts reasons Accounting teachers were not happy about the large class size, with the total frequency of 36 resulting from participants' allusion to multiple reasons. The reasons, ranked according to their frequency of appearance, suggest that 31% (n=11) of the teachers felt that it was difficult to provide individual attention to learners. 17% (n=6) of the teachers indicated that they had problems with managing a large class, while 14% (n=5) felt the amount of marking becomes burdensome, so they give less practice work to learners. Figure 2 below illustrates that 26% (n=6) of teachers believed that the ideal class size would be a class comprising of 26 to 30 learners. At least 22% (n=5) of the teachers considered a class with above

30 learners to be ideal, while another 22% (n=5) of the teachers preferred a class of at least 16 but not more than 20 learners. However, 17% (n=4) of the participants preferred 21 to 25 learners while a negligible number of participants 13% (n=3) preferred 10 to 15 learners in their class. Table 4 below indicates that more than a third (n=10, 37%) of the teachers believed that the different learner capabilities helped to enhance teaching in accounting, 30% (n=7) cited team work as another benefit of teaching in a large class. Sharing of ideas among learners, 19% (n=5), competition between learners, 11% (n=3) and also the easiness to identify good learners, 7% (n=2) were other benefits mentioned by participants. The total frequency (n=27) emanates from participants' allusion to multiple advantages.

Ideal class size

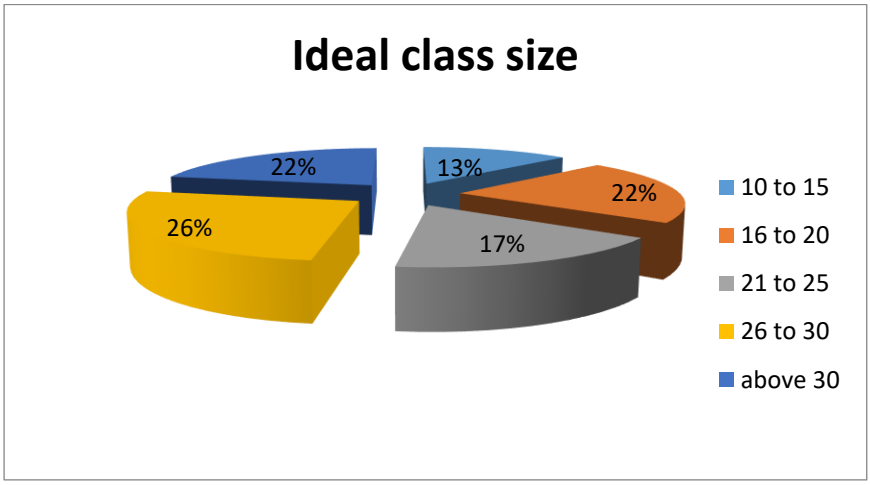

Figure 2: Ideal class sizes

Benefits of teaching accounting in a large class

Table 4: Benefits of teaching in a large class

Advantages	Frequency	Percentage
Diversity of learners with different capabilities	10	37%
Teamwork	7	26%
Sharing of ideas	5	19%
Allows competition among learners	3	11%
Easy to identify good learners	2	7%

Need for the use of different teaching methods.

Figure 3 below indicates that 80% (n=20,) of participants used a different teaching method when teaching accounting in a large class than when they were to teach a smaller class and only 20% (n=5) would use the same teaching method regardless of the class size

Table 5 below shows a variety of reasons why participants preferred to use different methods for teaching accounting in a relatively large class than when they taught in a relatively small class. The table shows that more than half of the reasons given by the teachers were due to the differences in the learners' capabilities 60% (n=15), 28% (n=7) indicated they change their teaching methods depending on the easiness to focus on individual learners and 12% (n=3) said such a change would depend on the easiness to monitor that given class.

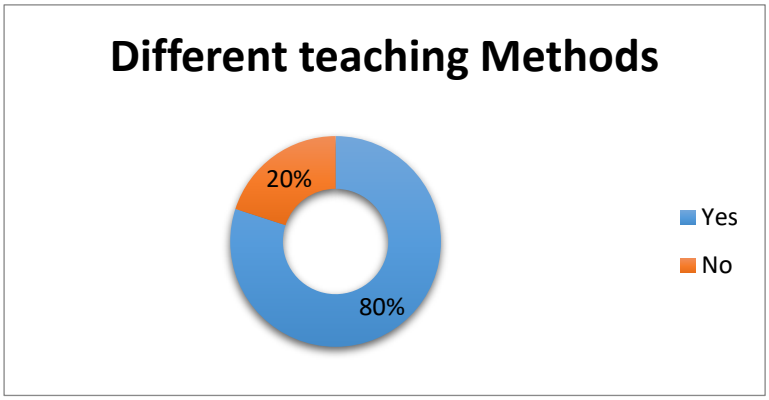

Figure 3: Need for the use of different teaching methods

Reasons for the use of a different teaching method when the class is large

Table 5: Reasons for differences in teaching methods

Reasons	Frequency	Percentage
Differences in learner capabilities	15	60%
Easiness to focus on individual learner	7	28%
The easiness of monitoring a class	3	12%

Qualitative findings emerging from the analysis of qualitative data transcripts revealed the following results:

Reasons for teachers to have felt happy with teaching Accounting in a large class

Learners with diverse potential intensify the challenge of teaching a large class

Quantitative findings revealed that participants enjoyed the challenge of teaching in a large class as this brings learners of different capabilities with it. Learners with a better understanding of Accounting repeatedly raised their hands during classroom observation, especially when the teacher asked a challenging question. These learners willingly demonstrated their answers on the board when asked by the teacher to do so. Some of these learners explained to their counterparts by helping them to work through the answers step-by-step. The following responses emerged to the question, "what are your general viewpoints about teaching Accounting in a large class?" during the interview

"You get different caliber of students, you have students that are intellectually gifted, so they motivate the other learners in the class. Teaching Accounting in a large class is enjoyable because it gives you the different learners, those who are good and the other slow ones" Participant 1.

"Sometimes the large group makes the class lively and enjoyable as there is a mixture of learners, those who are quiet and also the loud ones." Participant 2

"The slow learners are motivated by the good ones in such a big class." Participant 3

Ease with which ideas flow among learners in groups

Quantitative findings indicated that learning in groups enabled work and ideas to flow efficiently among learners. The researcher also observed that during a class discussion, learners were sharing ideas in groups, where learners with a better understanding were leading the discussion and were also chosen to present on behalf of their groups to the whole class. The question "What are your viewpoints with regards to teaching Accounting in a large

class?" was asked during the interviews and the following responses emerged.

> *"Learners get to help each other in groups especially when they do not seem to get what I say"* Participant 4

> *"In group discussions you find the good learners helping the weak learners"* Participant 5

> *"…It helps to have the big class as learners who are good in Accounting become assistant teachers"* Participant 6

Learners requiring assistance easily identified and grouped with brilliant learners.

Quantitative findings suggested that teaching in a large class made it easy to identify learners who needed assistance, and once identified, mixed-ability groups were then formed to accommodate these learners together with gifted learners. During observations, participants arranged for group discussions that involved learners with a better understanding in Accounting in helping those who were struggling. When participants were asked during the interviews as to "what would you consider to be the advantage of teaching Accounting in a large class?" the following responses emerged

> *"Everyone gets to be involved because usually I make the groups to be smaller so that everyone can participate."* Participant 7

> *"Group discussions allow the learners to use their capabilities as others lead in doing the research and others become the groups' spokesperson."* Participant 8

"Learners help each other in large classes." Participant 9

Reasons for teachers to have not been happy with teaching Accounting in a large class

Less participation from shy learners

Quantitative findings indicated that learners that were too shy to express their ideas in class rarely participated during the question-and-answer session. During the classroom observations, it transpired that most lessons involved teachers asking questions orally and learners giving answers simultaneously. In most cases shy learners sat at the back of the class and would make no attempt at responding to the teacher's questions. When the teacher points to a specific learner as a gesture of asking for a response to the question asked during the lesson, these learners would not attempt to answer and hope that the teacher would point at another learner. However, some learners would normally make reasonable attempts and provide the teacher with correct answers. In response to the question "Does the teaching process normally run well in a class of this size?" participants had this to say

"No it doesn't, other learners do not participate in discussions" Participant 4

> *"Some pupils don't participate, they seem to be shy and hide behind others; they relax; so sometimes you don't get the feedback you expected to get because not everyone is involved. It is easy for them to hide…when you ask oral questions only those who are good in the subject would participate and those who are shy and those who are struggling would not participate, hiding behind those who would normally give answers"* Participant 8

> *"Some learners are quiet, they do not raise their hands, so it is very hard to get all of them to be*

involved in whatever is discussed in class" Participant 5

A lot of marking

Quantitative findings suggested that participants were not happy with teaching Accounting in a large class as this involved a lot of marking. Accounting is a subject in which the presentation of theoretical content needs to be complemented with numerous exercises given to learners for them to apply this content on case scenarios; hence, learners are expected to complete many written tasks. During the lesson observations, written work completed by learners the previous day was often marked in class, with the teacher announcing the answers or instructing learners to write the answers on the board. Teachers never came with marked learners' exercise books to class. During the interviews, participants were asked a question "how do you cope with giving timely feedback to your learners in class?" and the following responses emerged

> *"the large numbers make it difficult for me to give work every day because I will then have to mark, in fact, I give them home work then the next lesson period we mark as a class"* Participant 3
>
> *"Accounting is a practical subject therefore one has to give work daily and then mark every day, this however makes me not to be able to focus on the other subjects that I teach"* Participant 2.
>
> *"There is a lot of work involved, a lot of marking, and a large number of pupils to be helped". It is not easy, I have to work extra time and sometimes I have to take the learners' work home to mark overnight"* Participants 7

Difficulty with which individual attention can be given to individual learners

Quantitative findings suggested that participants were not happy with teaching Accounting in a large class owing to the difficulty with which individual attention can be afforded to learners. In most lessons observed, teachers were not able to attend to all learners. As they moved around the class, they could only attend to address queries raised by only a limited number of individual learners, as they could not reach out to all learners owing to time constraints. Participants alluded to this during the interviews when the following question was asked, "was the lesson intellectually stimulating given the class size?"

> *"I fail to attend to each and every child though they have different needs; you only end up interacting with those seated in front and the others are left behind, you don't even know whether they are understanding, if they are not part of the discussion"* Participant
>
> *"With a large class it is difficult to give individual attention"* Participant 8

When the question "what are your viewpoints towards teaching accounting in large classes?" was asked, the following response emerged;

> "*...not all pupils get the opportunity to have the teacher's attention and interact with the teacher to show their capability"* Participant 3

Qualitative results seem to have converged with quantitative results in the sense that they both report similar reasons for teachers to be happy, and to be unhappy with teaching Accounting in large classes. Quantitative results indicate teachers were happy as they found it convenient for them to teach because large classes come with learners with different capabilities (frequency 20%) (see Table 1), a case that is supported by qualitative results. Quantitative results also suggested that

teachers found it convenient for them to promote learning in groups (frequency 13%) (see Table 1) and qualitative results support this, as it is more possible for teachers to divide learners into groups in contexts where classes are relatively large. Quantitative findings revealed that slow learners are able to benefit from well performing learners (frequency 7%) (see Table 1) and this could suggest the sharing of ideas among students of different capabilities as established from qualitative findings.

However, some participants felt unhappy with teaching Accounting in large classes and both qualitative and quantitative findings converge on this. Quantitative findings revealed that learners, especially shy learners hardly participate in class (frequency 6%) (see Table 2) and qualitative findings support this as the researcher observed this in class and confirmed it through interviews. Quantitative results also established that participants felt strongly against teaching Accounting in large classes as this inhibits their efforts to provide attention to individual learners (frequency 31%) (see Table 2). Qualitative results report that the researcher observed that the teacher could only attend to few individuals during the lesson and confirmed this through interviews. Quantitative results also revealed that participants were not happy to teach Accounting in a large class because this came with a lot of marking (frequency 14%) (see Table 2), and qualitative results report that instead of teachers marking learners' written work on their own, they had this marked with learners in class.

Difficulty with which a large class can be managed.

Large classes are difficult to manage as this became evident during the lessons the researcher observed. It was noted that teachers spent most of the teaching time attending to social problems. Some learners made a lot of noise as teachers attended to other learners who argued about other things as the lesson continued.

The researcher also observed that at the beginning of most lessons' learners were unsettled while other learners arrived late in class for lessons especially in schools where accounting was done across the streams. Moreover, during the lessons learners would sometimes be talking among themselves, other learners took much time to focus on what the teacher was doing. The teacher would hardly deliver the lesson undisturbed as most teachers had to correct certain disruptive behaviours for a significant part of the period. One participant made the following comment when the following question was asked in an interview 'Does the teaching process normally run well in a class of a relatively large size?"

"The class is big; it is not a manageable class. It is easy for the learners to misbehave since they are many. I try to manage the class, but it is challenging" Participant 9

Another participant responded as follows.

> *"The noise making and other social problems in my class are a challenge especially now that corporal punishment is banned in our country. I am in a dilemma of how to positively discipline my pupils when I have such a big number in front of me. It is very difficult to manage especially when doing group work"* Participant 3

Yet another participant who was asked the question "was the teaching method appropriate for the large class?" had this to say

"Most of the time I am tempted for the lessons to be teacher centered so that I can be in front and control the discussion. I am the one now who leads the lessons instead of the learners" Participant 9

This denotes that the state of the situation in class eventually forced the teacher to break away from the normally presumed to be effective learner-centered methods of presentation to the proclaimed to be less inciting teacher-centered methods.

DISCUSSION OF RESULTS

Teachers' perceptions and experiences in terms of challenges of teaching large classes

Findings from both quantitative and qualitative aspects of this study show that large accounting classes pose several challenges for the teachers which resulted to inefficiency during the teaching process. Teachers have revealed that such challenges include difficulty with which a large class can be managed, a lot of marking, no individual attention given to learners, lack of a relationship between teachers and learners, lack of participation from learners and not enough time is given for the lessons. *Difficulty with which a large class can be managed* - The findings from this research show that teachers were finding it difficult to work with the learners in large classes. There were discipline issues which the teacher had to attend to which would affect the teaching process. The teachers indicated that a large class needs one to have classroom management skills as the disturbances from the learners slow down the teaching process. This study finding is supported by (Kewaze & Welch, 2013; Machika, Troskie-de Bruin, & Albertyn, 2014; Trow, 1999). *Difficulty with which individual learner attention can be administered* - Findings from the study showed that teachers had difficulty in attending to all learners. Responses from questionnaires and interviews were both in agreement that teachers in large accounting classes faced challenges in giving individual attention to learners. The reduction in the level of communication was also observed by Mamman et al. (2015) who agreed that large classes hindered one on one communication between the teacher and the learners. *Lack of participation from learners* - The lack of participation from the learners was revealed by teachers as another challenge of a large class. This concurs with Blatchford (2011) in their study that slow learners at the secondary level hardly participate in large classes. He asserted that learners are actively engaged in classes where they are fewer. The higher the number of learners in each class, and the less likely there would be active interaction between the teacher and the learners. *Difficulty with which many practice exercises can be assigned to learners* - The quantitative research together with responses made by a number of teachers in interviews and observations made revealed that teachers have come to a decision to give fewer classroom exercises and homework to reduce the marking load. There was also a tendency for the teachers to encourage chorus answers which were recall and route learning instead of promoting critical thinking. This finding corresponds with Monks and Schmidt (2010); Cakmak (2009) and Yelkpieri et al. (2012). *A lot of marking* - Quantitative and qualitative findings revealed that teachers teaching in large accounting classes had to cope with a lot of work in their teaching process. Most of the written work given to learners was left unchecked by the teacher or not discussed in class during the next lesson; leaving learners with the only option to check and mark their own work against one another's work. This finding is consistent with studies by Cakmak (2009) and Kewaze and Welch (2013).

Teachers' perceptions and experiences in relation to their teaching in Accounting.

The purpose of the study as outlined in the paragraph on the introduction to this section has been identified as "to explore how teachers' perceptions and experiences of teaching Accounting in large classes relate to their teaching in Accounting". Based on this, the second critical research question emerged as "How do teachers'

perceptions and experiences of teaching in large classes relate to their teaching in Accounting". The following presents a discussion based on the extent to which this research question has been answered through a process of inductive analysis of data. *Diverse learner capabilities* - Findings from this study showed that certain participants believed that large classes offered individual learners the benefits of learning from the diverse capabilities of other learners and allowed the teacher to adopt a variety of teaching strategies that appeal to different personalities within a group, and this made teaching in a large class an interesting experience for the teacher. *Opportunity of exploring other resources* - Participants were able to extend to their learners in large classes an opportunity to explore other resources rather than the teacher. Instead of relying on the teacher as the only source of their learning, learners were engaged in the process of learning from each other as they helped each other with finding solutions of the problems of how relevant entries could be made from source documents and this was prevalent when the teacher used group discussions. This is in accordance with the study findings by (Cheng, 2011). *Independence* - During the lessons observed with teachers and learners in class, learners appeared to be working independently, trying to solve the given tasks as individuals as well as with their co-learners especially where group work was given or where a teacher would still be moving around helping learners. Learners are autonomous and learn self-directed learning skills.

CONCLUSION AND RECOMMENDATIONS

The purpose of the study was to explore teachers' experiences of teaching accounting in large classes. The following conclusions were drawn from the findings of the study. Findings of this study revealed that most accounting teachers were not happy with their class sizes as they faced several challenges when teaching accounting in such large classes. There were, however, to a lesser extent, certain teachers who were happy with their class sizes as they believed that there were benefits derived from teaching a class of more than 30 learners. In addition, it can be concluded from the findings that most accounting teachers would change their teaching method when teaching a large class and a few indicated that they would not change the teaching method. Finally, findings indicated that all teachers agreed that evaluating the work from group learning were vital, but they used different ways to assess it.

Among the recommendations are that accounting class sizes should be reduced so that an active learning environment is promoted. Large classes discourage teachers to give learners a lot of practice work, learner centered activities and non-objective forms of evaluation as this is time-consuming. Secondly, available classroom space should also be taken into consideration the number of learners in a class. The classrooms were overcrowded which limited the teachers' movement around the class. There is a necessity for more and improved resources such as materials for teaching and learning, books, facilities, and equipment. Thirdly, professional development of teachers on positive ways of disciplining learners is also necessary. Discipline issues were one of the major issues in the large accounting classes which slowed down teaching processes. Finally, there is a need for the training of all teachers, pre-service and in-service, on the most effective methods of teaching in large classes. The COVID-19 pandemic has changed the education landscape resulting in the rise of online (virtual or remote) leaning. Teachers teaching large classes (including teaching small classes) should use Blended-Learning (Flipped classroom) approaches when teaching accounting. Synchronous and Asynchronous learning should be

promoted. Learning is 24 hours, 7 days a week. Teachers teaching large classes must allow learners to book for teacher-to-learner or teacher-to-learners face-to-face or online consultations. For flipped classroom activities, teachers could use social media could be used such as WhatsApp, telegram, Signal, Text SMS, emails. Teachers teaching large classes are encouraged to use online tools (i.e., Google drive tools) to make their face-to-face or online accounting lessons more engaging, interactive, interesting, and inspiring. Tools could be used to teach and assess learners in large classes.

The present study opens opportunities to further explore the variables that constitute effective teaching in large accounting classes in different settings and from different perspectives. Other stakeholders may be involved such as the learners, school administrators and parents. Another dimension that can be a subject of further research is the exploration of the various ways in which technology can be used to teach accounting in large classes.

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Educational Testing Techniques in Senior Secondary School Physics in Nigeria: Are We Ascertaining the Development of Requisite Behavioural Objectives?

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ABSTRACT

In order to estimate exam question demands and distributions in senior secondary school physics, this study was conducted. For the determination of the types of tasks involved, quantitative and qualitative research methods were combined (mixed method). Using Bloom's taxonomy of educational objectives, content analysis was carried out on questions from West African Examination (WAEC) and University of Cambridge International Examination. A perceptual Rating Scale (PRS) with a reliability coefficient of 0.89 was used to determine the readability indices of the questions. Detailed information on the subject matter was gathered through an in-depth interview of two students who sat for the two examinations in the year 2021. Analysis of the data obtained was conducted using inductive thematic analysis and descriptive statistics. Bloom's taxonomy revealed that most questions were related to the lower levels (remembering and understanding), but no or very few questions were related to the higher levels. These outcomes portend far-reaching implications for the overall goals of teaching physics. It was therefore recommended that besides scaling up the training for inspectorate officers in the Ministry of Education, it is highly imperative for critical stakeholders and examination bodies, in particular, to promote questions along higher-order cognitive levels.

Keywords: Bloom's Taxonomy, Higher-order cognitive skills, Physics Test Items.

INTRODUCTION

Educational testing remains the most plausible means of ascertaining students' scholastic attributes. There is growing attention among nations on issues relating to testing possibly due to international benchmarking (Kamens and Mcneely,2009). Baker (2008) described a cascade of influences of well-designed tests to include: evaluation of students' progress, assessing whether students are learning what was intended, promoting good study habit, increasing motivation for learning and provides feedback and corrective measures.

Examining bodies at national and international levels employed tests to make judgements and providing feedback and corrective measures. Despite stupendous emphasis dedicated to science teaching by doing, there is an over-domineering role of the paper and pencil approach to testing. It is doubtful whether this testing approach will measure a high degree of competence in scientific activities that involve a high order thinking process.

Aligning science teaching advances with science testing techniques represents a real challenge for the science education community. In today's science classroom, teachers are being trained in ways to be more effective at instructing students. Furthermore, students are encouraged to think critically and creatively, acquire scientific understanding, and understand the various points of view surrounding them. Science should be seen as a real and attainable goal by students beyond understanding concepts, processes, and the discipline's nature. Cervetti & Barber (2008) argue that conceptual understanding of scientific topics has little effect on students' actual decisions about real-world issues, despite historical tension between text-dominated and conceptually tailored testing techniques (Nisbet & Scheufell, 2009). If science

education and development is to make a difference in the lives of teachers and students, it must be aware of changing policy and public awareness contexts. A way out of this daunting challenge possibly will be to reflect on the current practice in curricula development in educational testing techniques. A cursory look at some of the overarching objectives of the two examining bodies reflects this. Excerpts from their curricula provisions reveal the following:

The University of Cambridge International Examinations emphasized a curriculum structured such that students attain*:*

An understanding of theory and practice

Learning about the development and evolution of scientific theories and methods resulting from the collaboration of groups and individuals

The Nigerian Senior Secondary School Physics Curriculum was designed to*:*

Make sure society has a basic understanding of physics for it to function effectively

To prepare for the technological application of physics, acquire essential scientific skills and attitudes

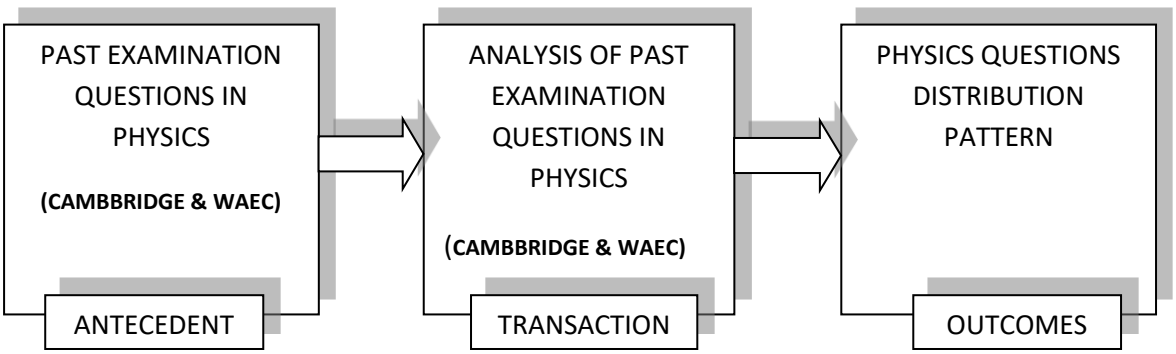
Enhance creativity by stimulating it (Amusa, 2021).

Students study in ways that reflect the assumptions they hold about their future tests, as evidenced by a growing body of research. When they expect a test that focuses on facts, they minimize details; when they expect a test that requires problem-solving or integrating information, they strive to understand and apply it. Developing and implementing assessment tools that meet the curriculum's goals or help students improve their higher-order skills should be the goal of education (Gal & Garfield, 1997). It implies that testing in physics should place much premium on higher-order cognitive skills, which will task students to acquire visual, spatial, and problem-solving skills and the ability to transfer knowledge to daily life experiences (Istiyono et al., 2020). By acquiring such skills, learners will be equipped with useful knowledge, reasoning abilities, skills, and values for success in the workplace and in their daily lives.

This study sought to identify the distribution and demand of physics examination questions in senior secondary school and extrapolate those transferable skills that make science relevant to everyday life of students (Amusa & Emmanuel, 2022). There was an attempt to compare questions from two examination bodies (WAEC and the University of Cambridge International Examination) in order to identify areas of strength and weaknesses of WAEC physics questions.

THEORETICAL FRAMEWORK

In this study, the Stake's countenance model (1967) was considered due to its ability to distinguish failure due to a lack of logical contingencies (theory failure) from failure due to incongruence between the program model and the actual behaviour of the program. Stake (1967) suggested three stages for evaluating educational programs: antecedents (previous evaluation conditions), transactions (during the implementation of the program), and results (the results of the program). Diagrammatic representation of these variables for this study is shown as



The study also employed Anderson and Krathwohl's (2001) modified version of Bloom's (1956) taxonomy to guide it. In the development of behavioral objectives, Bloom's (1956) taxonomy of educational objectives has been used as a guide. Education has three components: cognitive, affective, and psychomotor. Cognitive domains were the focus of this study since the affective domain is not assessed by examining bodies, and the psychomotor domain is largely higher-order cognitive. As identified by Bloom (1956) and cited by Akinboboye and Ayanwale (2021), there are six levels:

- Remembering that requires recognition of facts, principles, or processes.
- Understanding entails the acquisition of skills to explain or summarize.
- Applying requires the ability to make use of acquired knowledge in a new situation. It also involves the performance of some mathematical logarithms or manipulations.
- Analyzing, which requires the ability to break apart a whole or concept into components.
- Creating. is the ability to arrange and combine pieces, parts, or elements in such a way as to constitute a pattern or structure not present before.
- Evaluating involves qualitative and quantitative judgment about the extent to which materials and methods satisfy criteria laid down by students.

The publication of Bloom's taxonomy of educational objectives in 1956 led to numerous changes in our testing techniques, which influenced the evaluation of new knowledge by educators, students, and teachers. It was because of this that Anderson and Krathwohl (2001) revised Bloom's (1956). In addition, the revised version does not have a cumulative hierarchy like the original. Each stage is now considered a cognitive process. The knowledge is classified as factual knowledge (basic knowledge entails such verbs as remember, understand, classify, describe, discuss, explain, identify, locate, organize, select, translate), conceptual knowledge (knowledge of concepts, theories, models, and structures), procedural knowledge (methods of inquiry and algorithms), and metacognitive knowledge (Akinboboye & Ayanwale, 2021; Wilson, 2005). In fact, factual and conceptual knowledge deals with products, whereas procedural knowledge deals with steps to be followed. Also, included in procedural knowledge are criteria for when to use various procedures and an understanding of the different processes. Thus, This study examines the higher order thinking skills required to examine the prevalence and demand of physics questions. Additionally, the study measured the frequency with which higher-order skills are assigned to senior secondary physics students.

METHODOLOGY

An assessment of two examining bodies' physics exams was conducted using mixed methods research; the West African Examination Council (WAEC) and the University of Cambridge International Examination Council (UCIEC). While WAEC sets examination questions on senior secondary physics curriculum (ordinary level certificate examination) for students in Nigeria and other West African countries, UCIEC tests international students on the General Certificate physics curriculum. Quantitative data were gathered through content analysis of the questions using Bloom's taxonomy as modified by Anderson (2005). In addition, reliability indices were developed to assess the extent to which the question items directly or indirectly relate science concepts to learners' everyday lives. A qualitative dimension was the open-ended (in-depth) interview conducted among graduates who sat for the examination within the years under investigation. The participants for the interview were selected convenience sampling technique from among the senior secondary school III graduates who took the two examinations in the past.

The procedure involved subjecting every question item of the examination to content analysis along the modified version of Bloom's taxonomy of educational objectives (cognitive domain). For a start, examination questions in physics were carefully perused to determine years where students' performance was abysmally poor, and such years were under-

scored for analysis. This was informed by the assumption that greater number of higher order tasks are likely to be present for such questions. A training session among researchers was organised to ensure that the tasks of analysis was achieved with near perfect competence. A training guide was prepared which provided clarifications on the task to be done. It consisted of two parts.

Part A explained the six types of Socratic questions: question for clarification, questions that probe assumptions, questions that probe reason or evidence, questions about viewpoints and perspectives, question that probe implications and consequences and questions about the question. These were further reduced to factual, convergent, divergent, evaluative and combinations. Concrete examples were provided in each of the cases. The second part considered levels of questioning using Modified version of Bloom's taxonomy (remembering, understanding, applying, analysing, evaluating and creating). Question cues (possible verbs) and examples were provided for the various levels as guide to researchers. The lead researcher anchored the training by providing vivid explanations on the content of the manual. All researchers were required to carry out analysis of ten items of a past question paper in physics (not used for the study). This involved placing a tally against appropriate level of Bloom's taxonomy. Total frequency and corresponding percentage frequency were computed for each of the levels. Results were compared and the process repeated individually and then collectively. A perfect outcome (common results) was achieved by the fourth attempt.

The Perceptual Rating Scale (PRS) was used to determine the readability indices of the questions. Baiyelo (2000) noted that teachers' perception quite ably represents students' perception of readability. Baiyelo (2000) tested this assumption from an interview with a small sample of teachers and a view of students. The congruence of these ratings obtained from a rank order correlation of 0.98 attests to the underlying assumption of high construct validity. The Readability index of the question items was determined through a self-constructed rating scale. PRS consisted of 3 distinct criteria: Deduction from diagrammatic illustrations, Illustrations relating to daily life experiences, Task involving numerical problems. These were arranged against two columns:' Yes' where the task is available and 'No' in a situation of the non-availability of a task. Researchers took a tally of Yes for each of the criteria. The rating was validated by subjecting it to peer review among three physics teachers. Readability was established, with some other questions not included in the study. There was no disparity in the scoring obtained among researchers. A split-half method was employed to establish reliability, and a value of 0.81 was obtained. Frequency count and percentage frequency were obtained and represented pictorially through a component bar- chart.

Two students who performed exceptionally on the two examinations were interviewed in-depth (open-ended). The sample size was determined by convenience sampling of two students from different universities with a secondary school science certificate. Their respective undergraduate degrees were in medicine and engineering from a Nigerian university. The aim was to determine the extent to which the demand for ordinary-level questions prepared them for education and daily life. The interview was recorded and transcribed.

RESULTS

Table 1 shows the preponderance of question items at lower level (remembering and understanding) throughout the years under consideration and cut across the two examining bodies. It reveals further that at least one-quarter of the examination question items (except WAEC 2003) dwell on applying. As the table indicates, there is a complete absence of question items (except 2006) and higher levels (analyzing, evaluating and creating) in WAEC while there are fewer representations of question items at higher levels for the Cambridge examination.

Figure 1 below reveals that the Cambridge examination rather than WAEC provided more questions that required students to deduce from diagram. However, Cambridge examination contained fewer problem-solving tasks than WAEC. However, the two examinations have comparable number of

question items that relate physics concepts to the daily life experiences of learners.

An interview was conducted to inquire from students whether the testing techniques prepared them adequately to cope effectively with challenge posed in their chosen career while in school. The interview conducted was recorded and transcribed. Excerpts are presented:

Question

While in the high school, are you familiar with thought- provoking questions (involving critical analysis, deep reasoning and analytical task) in physics while in high school?

Engineering Student:

Not really. We are more exposed to solving numerical problems and questions that deals more with definition and explanation of scientific concepts.

Table 1
Frequency and percentage distribution of question items along with Bloom's taxonomy of educational objectives

Year	Exam Body	Remembering	Understanding	Applying	Analysing	Evaluating	Creating	Total
2003	WAEC	33 (36.6%)	39 (43.3%)	18 (20.0%)	-	-	-	90
	Cambridge	18 (19.1%)	23 (24.5%)	43 (45.8%)	05(5.0%)	03 (3.0%)	02 (2.0%)	94
2005	WAEC	34 (33.7%)	30 (29.7%)	37 (36.7%)	-	-	-	101
	Cambridge	12 (12.9%)	36 (38.7%)	38 (40.9%)	03(3.0%)	03 (3.0%)	01 (1.0%)	93
2006	WAEC	18 (35.2%)	19 (37.3%)	13 (25.5%)	- -	01 (2.0%)	- -	51
	Cambridge	10 (13.5%)	31 (41.9%)	27 (36.5%)	03 (4.1%)	02 (2.7%)	01 (1.4%)	74
2009	WAEC	21 (20.2%)	43 (41.3%)	40 38.5%)	-	-	-	104
	Cambridge	10 (11.9%)	35 (41.7%)	34 (40.5%)	02 (2.3%)	02 (2.3%)	01 (1.1%)	84
2013	WAEC	106 (30.4%)	131 (37.5%)	108(30.9 %)	04 (1.1%)	- -	- -	349
	Cambridge	50 (14.5%)	125 (36.2%)	142(41.2 %)	13 (3.7%)	10 (2.9%)	05 (1.4%)	345

Medical student:

In physics! Certainly not. This was experienced only in further mathematics

Response to this question accentuated the questioning pattern at ordinary level have not been geared towards solving spatial-visual problems. Question items can always be step up to the level of applying, analysing, evaluating and creating or down irrespective of the level of the learner. Doing this will only task students reasoning apparatus and inculcate appropriate scientific attitude. For instance, engineering or medicine requires a critical analysis, deep reasoning and analytical mind. A solid foundation could be laid where the testing technique is thought- provoking.

Question

Has your ordinary level physics examination prepared you adequately to cope effectively with the pattern of examination pattern in your degree programme?

Engineering student:

The orientation provided by physics examination at the ordinary level dwelled on regurgitation of acquired knowledge and not the application of knowledge often. However, at the university level, you engage yourself in serious thinking and tasking your brain. The two examinations are of the different ball game

Medical student:

No! You indeed need the knowledge and understanding of concepts at an ordinary level to do well in both examinations. However, the gap in demand for testing between both examinations is very wide.

Response by students further cast aspersion on the present testing technique. Whereas the rigour involved in the two examination cannot be the same. However, the ordinary level should provide students with appropriate scaffolding to ensure smooth transition.

Question

What makes the difference in the pattern of questioning between your ordinary level and university degree examinations?

Engineering student

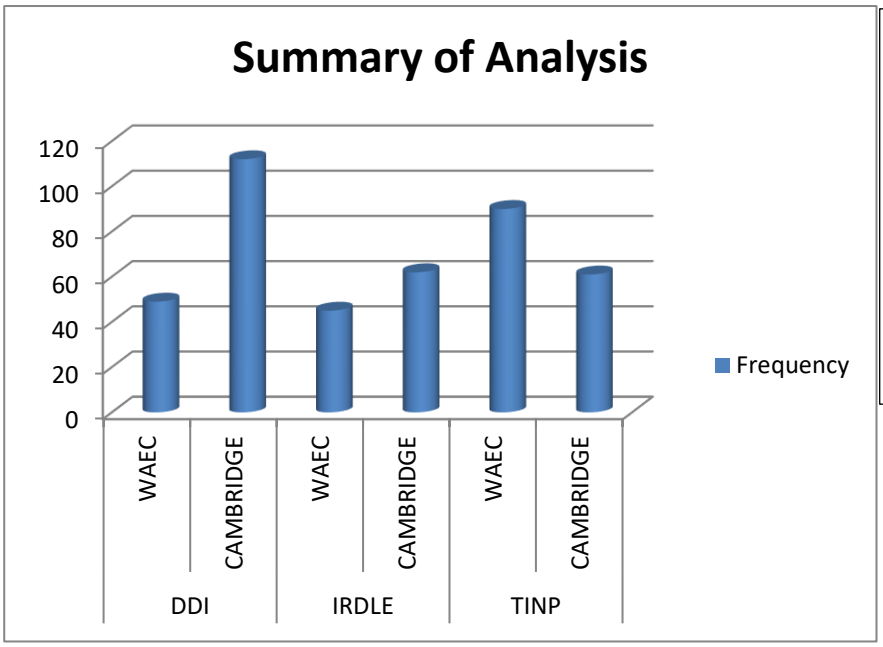
Ordinary level physics questions are less tasking and involve your ability to analyse data and substitute and simplify. For the degree programme, this is not so. It is more tasking and requires your ability to visualise, engage in imagination and concretize, all these will depend on your competence to think critically and analytically.

Medical student

There are differences between two examinations from my own perspectives. It is often difficult to maintain the same high score in your degree programme. This is because you require great analytical skills not exposed to at an ordinary level.

The response above implies that where there is congruence in the testing technique for ordinary and degree program, students at the degree level may achieve better than we are witnessing.

Figure 1: Showing component bar-chart on the readability of examination questions in physics.



KEY:

DDI: Deduction from diagrammatic Illustration

IRDLE: Item Relating to Daily Life Experiences

TINP: Tasks Involving Numerical Problems.

DISCUSSION OF FINDINGS

The finding of this study revealed the preponderance of question items at lower levels (knowledge and comprehension) of Bloom's (1956) taxonomy of educational objectives in the cognitive domain. This agrees with earlier finding of Kellaghan (2004) but contradicts the nature and effective way of learning of physics as a subject. Physics entails that students analyse events conceptually, think creatively and have the ability to solve problems. Present observation only promotes memorisation and regurgitation of facts, concepts and principles. Using the classification of Wilson (2006) connotes factual and conceptual knowledge.

The study revealed a fair representation of question items and the application level. This is a welcome development as students will comprehend and interpret physics and explain the situation they face in daily life. Researchers

(Kelleghan,2004; Ayvaci & Turkdogan, 2010) think that opinion that application questions should dominate the higher-order skills with a corresponding reduction in questions requiring retention skills. This was observed in the Cambridge examination (figure 1) where diagrammatic illustrations were employed to relate physics to daily life experiences. Students were tasked to interpret diagrams concerning specific physics concepts.

Findings further revealed (table1) the lack (Cambridge) or complete absence (WAEC) of questions along with the higher level. This confirmed an earlier finding by Kellaghan (2004) and supported the general view that the spread and demand for public examinations in physics have not matched the curricula prescriptions. This may be attributed to the preponderance in physics classroom of the lecture method (Owolabi, 2004) where teacher talks and students listen. Intellectual transaction in such classrooms promote recall of facts and passive listening and are usually devoid of activities. Invariably teachers who engaged in the lecture method have no plausible alternative but to adopt the same way (construct questions that require recall or memorizing ability) in testing to avoid massive failure of students in physics. The use of higher order skills in promoting technological advancement are well documented in the literature. Students who have such skills well developed in them are usually creative, critically minded and efficient problem solvers. They are also capable of visualising problem and are imaginative thinkers. Effective questioning should raise issues which trigger students to think and stimulate mental activities. According to Kocakaya and Goren (2010), quality of question asked in physics usually contributes to the creativeness of students and their critical mind. At the same time, the Cambridge questions have more questions tasking students on deductions from graphical illustrations triggering students reasoning and higher order cognitive skills. The WAEC questions dwelled less on this, hence the low representation of questions along this critical area.

The findings of this study have revealed that a lacuna exists between the antecedent (curricula objectives), the transaction (past examination questions), and the outcome (past examination questions distribution pattern). It implied that the overall goal of physics teaching is to prepare students for useful living and the applicability of physics to real-life situations. The testing procedure has not been fully satisfied. This portends a far-reaching implication for the teacher, policymakers, research in science teaching, and examination bodies. There is always a reluctance to change in light of any recent innovations. It becomes imperative to step up efforts towards supervision of teaching in physics.

Inspectorate officers should be retrained, as well as teachers that match the expectations on the field. There is an urgent need for a resurgence by the examination bodies in this direction. They should work in tandem with the practitioners' teachers who are to keep abreast of happenings in the classroom. More question items are required at a higher-order cognitive level than is presently constituted. Science education research beam light should be focused incessantly on what happens in physics classrooms. This will put teachers on their toes and provide valuable information and feedback to all stakeholders. There is a need to make physics teaching more activity based and familiarize students with thought-provoking, analytical, and visualizing tasks. These will develop in the learner higher-order cognitive skills (applying, analyzing, evaluating, and creating) needed as a springboard and bedrock for future career challenges in the sciences. Physics classrooms should be dominated by activity and participatory teaching. Physics should be related to the daily life experiences of students. A reflection of all these in educational testing is highly essential. The teaching of physics in these ways will bring out real mental skills, develop students' ability to think well, be intuitive and creative and use their cognitive skills when faced with problem-solving tasks and critical analysis. By providing students with appropriate education enables them to solve higher-order physics problems and enhances their ability to think critically. The present findings have implications for teacher classroom practice, teacher development, assessment practices, and curriculum renewal.

SUGGESTION FOR FURTHER STUDIES

It is desirable to extend our search light on higher-order objectives through documentary analysis of practice exercises in physics textbooks and curriculum evaluation strategies.

CONCLUSION

This study employed the stakes countenance model to explore the spread of question items in physics and the modified version of Bloom's (1956) taxonomy of educational objectives. Findings revealed that the current practice had created a huge gap in the educational testing procedure. There is a predominance of low cognitive skills questioning at the instance of higher cognitive skills. Hence a mismatch between policy expectations and reality.

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Enhanced creativity with Mini-PAT: A case of grade 9 Technology teachers in Sekhukhune East

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ABSTRACT

Creativity has become a prerequisite for societal progress, and schools are critical to this progress. The purpose of this study was to explore Grade 9 Technology teachers' creative pedagogy when handing Mini-PAT in schools around Sekhukhune East district. Qualitative research design was employed by the researcher to purposively sample five (5) Technology teachers from five (5) schools to participate in this study. Non-participant observations and semi-structure interviews were used as the methods of data collection from the participants. This study adopted Rashmi's four elemental model of creative pedagogy as a conceptual framework. The findings of this study have revealed that grade 9 Technology teachers have challenges in engaging their creative pedagogy when handling Mini-PAT and that hinders the promotion of creativity. These challenges are some of the reasons why the purpose of Technology of producing creative learners is not obtained. This study calls for the Department of Basic Education to revamp the curriculum for Technology education, especially as it concerns time allocation for a smooth incorporation of creativity in the classroom. It also encourages subject advisors to come with better ways of training teachers on how to apply their creative pedagogies and the design process when handling Mini-PAT. Lastly, it encourages Technology teachers to reflect on their teaching strategies with respect to creative thinking skills.

Key words: Technology Education, Creativity, Teaching Strategies, Mini-PAT and Learning environment.

1 Introduction

Creativity is considered one of the higher orders thinking skills that must be taught in Technology education, but there is little evidence that it occurs in the classroom. For these skills to be facilitated successfully, they require Technology teachers to have a thorough comprehension of which Mini Practical Assessment Task (Mini-PAT) activities and teaching strategies to practice in the classroom. Mini-PAT refers to a set of short practical assessment tasks which make up the main formal assessment of a learner's skills and application of knowledge during each term (Department of Basic Education, 2011). Scholars believe that teachers fail to enhance creativity because the problematic nature of and inconsistent understandings about creativity make it difficult for teachers to know how to enact particularly in the absence of policy guidance or exemplars (Henriksen, Henderson, Creely, Ceretkova, Černochová, Sendova and Tienken, 2018).

The research projects conducted in South Africa concerning Mini-PAT such as Ramaboea, Ramaligela and Mtshali (2022)

and Gumbo (2019) have presented that some teachers do not even know how to apply Mini-PAT in their classrooms, while others fail to strengthen it due to the absence of educational resources (Kubheka, 2018). However, there have been a few studies on teachers' engagement of creative pedagogy when handling Mini-PAT in Technology classroom (Nkosi, 2020). Duchovicova and Tomsick (2017) note that while there is some consistent evidence of attention to creativity in education policy, school and teaching practice often remain rooted in conventional traditions (Collins & Halverson, 2018). These claims are supported by the observation made by Magolego, Mtshali and Ramaligela (2022) and Öksün and Kurt (2017) that teachers prefer using traditional didactics as compared to learner-centred because they are used to them.

It is very concerning that in this 21st century where creative engineers, technologists and artisans are in high demand, Technology teachers are still struggling to develop learners' creativity skills through Mini-PAT (Nkosi, 2020). One of the goals of the Technology subject in the CAPS document is to develop learners' creative thinking skills; however, Mathumbu, Rauscher, and Braun (2014) note that teaching in the Technology classroom is still limited to lower order thinking skills. They also emphasized that if learners are not encouraged to develop higher-order skills such as creativity, the goals of technology will never be realized, which may have consequences for future research.

Although the Department of Basic Education (2011) states that, Mini-PAT is designed to give learners the opportunity to develop and demonstrate their levels of ability, precisely creativity, the Curriculum and Assessment Policy Statement (CAPS) document does not inform Technology teachers of how exactly they can develop creativity through Mini-PAT. With that being said it was deemed necessary to explore how grade nine (9) Technology teachers engage their creative pedagogy when handling Mini-PAT.

3 Research problem

Mini-PAT is the core of the formal assessment of learners' skills and application of knowledge in Technology education (DBE, 2011). As stipulated in the CAPS document, these Mini practical tasks are designed to develop learners' creative and critical thinking skills (Department of Education, 2011). However, the dominance of direct instruction in Technology lessons has often provided little opportunities for practical exposure and further exacerbated the development of creativity during Practical Assessment Tasks (Chiliba, 2019; Ohemeng-Appiah, 2014). This study is underpinned by growing concerns that nurturing of creativity has not yet become reality in most subjects in schools. Attesting to this claim is a pre-study conducted by Magolego, Mtshali and Ramaligela in 2020 which was examining how grade 9 Technology teachers enhance creativity in the classroom. The findings indicated that the sampled Technology teachers could not enhance learners' creativity in class. Besides, this study takes note that Mini-PAT in Technology is the backbone of practical skills acquisition and ignoring how teachers creatively execute it may lead to results that were previously discovered. Thus, this study is concerned with exploring Teachers creative pedagogy when undertaking Mini-PAT.

2 Research questions

To address these above-mentioned challenges.

- Development of creativity when handling Mini-PAT in Technology education
- Execution of the design process
- Physical factors influencing the enhancement of creativity.
- Use of traditional teaching strategies,

This study probed the subsequent questions:

- How do grade 9 Technology teachers enhance creativity when handling Mini-PAT?
- What are the physical factors that influence the reinforcement of creativity in Grade 9 Technology classroom?

4 The Four-Elemental Model of Creative Pedagogy.

This paper explores grade 9 Technology teachers' creative pedagogy when handling Mini-PAT in the classroom. This study adopted the concepts of teaching for creativity and physical environment from Rashmi's (2012) conceptual framework of "Four elemental model of creative pedagogy". Due of its emphasis on promoting creativity in the classroom, this framework is intended to provide a comprehensive view of fostering creativity through education by illustrating the relationship between creativity and pedagogical practices. Rashmi developed four interconnected elements of creative pedagogy in an attempt to improve learners' creativity in the classroom: (1) creative teaching, (2) teaching for creativity, (3) creative learning, and (4) psycho-physical environment.

However, for the purpose of this study only teaching for creativity and physical environment themes are adopted. In this context, teaching for creativity entails providing learners with opportunities to develop their creative potential through assessments and activities. (Pusca and Northwood, 2018). Physical environment has to do with the space of the learning environment itself (Richardson and Mishrab (2017), these include factors such as resources and learner-teacher ratio. This paper investigated teaching for creativity and the physical learning environment [in order] to understand how grade 9 Technology teachers engage their teaching strategies, activities, and resources to enhance learners' creativity. The study looked at how teachers engage in the design process, problem solving, resources, and teamwork to get a complete picture of how teachers enhance creativity skills when handling Mini-PAT. These are the key fundamentals that can lead to learners' creative development during Mini Practical Assessment Tasks (Kubheka, 2018). The study looked at the availability of resources, time, and learner-teacher ratio to identify the physical factors affecting teachers' ability to promote creativity in class.

5 The enhancement of creativity in Technology classrooms

Creativity is at the forefront of the latest education shifts worldwide including China (Cho, Pemberton & Ray, 2017), Australia, Canada, England and United States of America (Perry and Collier, 2018; Collard and Looney, 2014). Several researchers such as Magolego, Mtshali and Ramaligela (2022), Lasky and Yoon (2020) and Ahmadi, Peter, Lubart and Besançon (2019) agree that creativity is a skill we should be teaching in classrooms because of its importance in the current society. It is therefore not surprising that most teachers are expected to develop the theory and practice of teaching and learning, as well as all other aspects of this complex arrangement to ensure quality preparation of all learners to life and work (Serdyukov, 2017).

Cultivating learners' creativity in Technology classrooms is crucial in aligning with the 21st century educational goals (Cremin and Barnes 2018). Creativity prepares learners to become technologists who are capable of solving problems in their respective places of work to meet the needs of the present society. In essence, the inclusion of Technology in the South African curriculum was motivated by the need to produce more engineers, technicians, and artisans, among other things (Department of Basic Education,

2011) through Practical Assessment Task (PAT) approach.

While there is some consistent evidence of attention to creativity in educational policy, school and teaching practice often remain rooted in conventional traditions (Duchovicova and Tomsik, 2017). Mathumbu, Rauscher and Braun (2014) add that, teaching in the Technology classroom is still restricted to lower-order thinking such as remembering, understanding and applying. They further emphasized that if learners are not supported to develop higher order skills such as creativity, the aims of Technology will never be obtained and this may have implications for further studies (Mathumbu, Rauscher and Braun, 2014). According to Kubheka (2018) design process, problem solving, educational resources and teamwork are key elements that can result in learners' creative development during Mini Practical Assessment Tasks (Mini-PAT). However, the research projects conducted in South Africa concerning Mini-PAT have presented that some teachers do not even know how to apply Mini-PAT (Gumbo, 2019) while others fail to strengthen it due to the absence of educational resources (Kubheka, 2018).

There is a plethora of literature on the factors that contribute towards the development of learners' creativity in the classroom (Beghetto & Kaufman, 2013; Rashmi, 2013; Smith & Smith, 2010; Beghetto 2010). Beghetto and Kaufman (2013) explored the role of individual factors and learning environment play in the development of learners' creativity. The individual factors include cognitive ability, self-belief, passion, and intrinsic motivation (Jauk, Benedik, Dunst et al., 2013). The importance of a conducive learning environment cannot be overemphasised because learners are from different backgrounds families, belief systems, experiences, interests, and abilities (Beghetto and Kaufman, 2013).

Rashmi (2012) opines that the learning environment, to a large extent, influences a learner vis-à-vis creativity in the classroom. He believes that creativity may be fostered successfully in the classroom through the interaction between successful teaching by a creative teacher, creative learning by the active learner, and a supportive psycho-physical learning environment (Rashmi, 2012). Additionally, in a study conducted by Liam (2018), he found that the learning process and school environment are the most important factors in developing creativity.

Chan and Yeun (2014) investigated the factors that facilitate or impede the enhancement of creativity in the classroom. The findings revealed personal and environmental factors as both facilitators and impediments. They also found that physical environment, time and space, atmosphere, curriculum and subjects, parents, and society were among the physical factors considered. They concluded that teachers frequently struggle to strike a balance between fostering learners' creativity and meeting other school demands such as meeting curriculum requirements. Sawyer (2015) also avers that schools appear to be the very settings that hinder rather than foster learners' creativity.

In most studies focusing on the physical factors affecting creativity enhancement in Technology classroom such Janak (2014) and Nkosi (2020), educational resources, time and pressure, and overcrowded classroom are commonest. These factors were also emphasised by the teachers in Chan and Yuen's (2014) study. With that said, factors including the learning environment, pedagogical content knowledge, collaboration between learners and teachers as well as the learning and teaching support material will all be examined thoroughly in this study.

6 Methodology

This study used qualitative approach as the methodology of this. Qualitative approach allows the researcher to combine descriptions of events, people and behaviours (Ramaligela, Mji and Ogbonnaya, 2015)

6.1 Population

The population for the study consisted of grade 9 technology teachers in Sekhukhune East. A purposive sampling of five Technology teachers from all the schools under Sekhukhune east district was chosen, precisely those who are in possession of B. Ed with Technology as a major subject and has been teaching Technology for at least two to three years. The participants' qualifications and experience were essential since teachers with suitable qualifications and experience in teaching Technology would be able to provide expert opinion on the object of the inquiry.

6.2 Data collection methods

The study used observations and interviews as data collection methods. The observations were aimed at determining the practices grade 9 technology teachers engage to enhance creativity when handling Mini-Practical Ass Task. According to Singh-Pillay and Sotsaka (2016), the advantage of using observation is that it provides researchers with first-hand experience, allowing them to generate detailed descriptions of the setting, activity, interactions, and participants' experiences. It also gives the researcher an opportunity to verify if the participants' observed behaviour is consistent with what they described in the interviews. A semi-structured interview approach was used to probe the physical factors that inhibit the development of learners' creative skills during Mini-Pat. Interviews allow researchers to engage in real time in-depth conversations with participants (Pietkiewicz and Smith, 2014). Rubel and Okech (2017) also add that interview provides the opportunity to build rapport with research participants and encouragement for meaningful reflection and sharing. Hence, this study deemed it suitable.

6.3 Data analysis

Data collected through observation were presented and analysed descriptively per item in the observation schedule. The observation data were presented narratively starting with the description of the participants, lesson presentations and the summary of the observation in relation to the applicable themes of the framework. In order to enhance the trustworthiness of the study, the researcher ensured credibility, applying triangulation and member checking. Triangulation helps to guarantee that, fundamental biases arising from the use of one method are overcome (Noble and Heale, 2019). Participants were given a chance to confirm the themes noted down during data collection, because credibility is mirrored when participants confirm that the findings are really what they said (Streubert & Carpenter, 1995).

The interview data were semantically analysed. Semantic analysis is a systematic description of the surface meanings of data, and the analyst is not looking for anything other than what a participant said or what has been written (Clark & Braun, 2013). Therefore, participants' inputs from semi-structured interviews were transcribed and coded. During this process of coding, responses projecting similar ideas were grouped together. This was done by reading all the transcripts and of course taking into consideration the key concepts and statements. Subsequently, the researcher coded important statement of each teacher's experiences in relation to the applicable themes of the framework to avoid repetition of the same statements.

The study consisted of open-ended questions which allowed flexibility in

expressing their opinions and experiences, which mirrored transferability (Polit & Beck, 2012). To enhance confirmability, the researcher presented the findings exactly how the participants shared their interpretations without adding anything. Participants were given an opportunity to confirm the correctness of their word for word recorded through notes during the interviews. The outcomes obtained were not by any chance influenced by the researcher's personal views and values. Lastly ethical clearance was issued by the University of Limpopo, the faculty of education, to guide the researcher in terms of ethical considerations.

7 Findings

The findings of this study were presented in a way that answer the research questions in relation to the teaching for creativity and physical environment themes of the conceptual framework.

7.1.1 How do grade 9 Technology teachers enhance creativity when handling Mini-PAT?

Teachers had a challenge in developing learners' creativity during Mini-PAT. These findings were based on observing the following.

Teaching for creativity

Design process

Looking at how teachers presented their lessons, most of the teachers' lessons, learning objectives, and content knowledge delivery were in line with the design process. Even though all the stages of the design process were not covered, one of the five stages was featured in their lessons. This is in tandem with the CAPS document that states that a Mini-PAT does not need to cover all the aspects of the design process unless it is a full capability task (Department of Basic Education, 2011). For instance, Teacher A asked learners to tabulate the differences between the three methods of preservation while Teacher B instructed the learners to analyse the properties of different plastics. These tasks are in line with the investigation stage of the design process. Investigation provides learners with an opportunity to evaluate existing products to develop a thorough understanding (Department of Basic Education, 2011).

However, the concern is these teachers only executed the first two stages of the design process, investigation and design and they did not present the scenarios of those tasks. Presenting the scenarios would have given learners an opportunity to develop and apply specific skills to solve authentic problems as encouraged by Rashmi's creative pedagogy. Learners were never provided an opportunity to build the actual artefact. The researcher believes teachers chose to focus on the theoretical part of the design process because they lack skills to facilitate practical lessons and resources since none of the schools had a Technology workshop. These claims are supported by the findings obtained by Mtshali and Ramaligela that, teachers lack understanding on how practical lessons are conducted in order to promote active learning.

Problem solving

With regard to problem solving, most teachers had a challenge in applying this strategy to develop learners' creativity. It was only Teacher E who engaged problem solving by asking learners to do a design brief and sketch the product they were going to make. The learners were expected to solve two problems, the first being to control land pollution and the second, producing a self-watering planter.

The sole purpose of teaching for creativity is to make the learning process interesting, productive. This element can only be mastered through the use of creative strategies such as problem solving, design process, project-based and case study. Reflecting back on Teacher C and D's

teaching strategies, they did not give some latitude for the learners to utilise their higher order thinking skills to solve problems. The focus was on surface learning and traditional tasks, because the class activities were just a memorisation of what the teachers taught. Teacher C's lesson objective that focused on designing and making a container to keep food warm for 24 hours without it rotting, was not achieved. Most of the learners were inactive as they were either sleeping or having private conversations. Rashmi (2012) avers that using imaginative approaches such as problem solving to deliver content often triggers learners' generation of new ideas, thus resulting in the enhancement of creativity. These teaching strategies allow learners to interactively participate and take control of their own learning. Thus, it is plausible to conclude that the research participants failed to enhance learners' creativity because they did not use the teaching strategies outlined in the four elemental model creative pedagogy and the recommendations enshrined in the CAPS document.

Resources

In terms of the availability and use of resources, all the observed teachers had a challenge. None of the teachers had a workshop furnished with Technology equipment and tools for practical tasks. However, there were some teachers who improvised by using their own resources and even encouraging learners to bring some resources from home. For example, Teacher E used his gadgets and data to show learners various plastic products. Teacher B as well instructed learners to bring resources such as milk bottles and freezer bags from home prior to the class. Even though they were not enough, the lessons were better compared to the ones who used textbooks only to facilitate their lessons. This is because learners were actively participating and engaging their creative skills in those classes that had resources. This in coherence with Taylor and Van der Bijl (2018)'s words that adequate resources such as Technological equipment and tools, have always been critical for Technology learners to acquire problem solving and creativity skills (Taylor and Van der Bijl, 201.

Teamwork

In the quest to develop learners' creative potential, Rashmi (2012) emphasises an environment that encourages a positive interaction, group work and prioritises learners' autonomy. During the observations most teachers encouraged learners to work in groups in most of the activities they gave them. The contrary was the case for Teachers C and D. It is noteworthy that in Teacher B's class, it is a norm to work in teams. This was evident in the group solidarity and identity which the learners exuded. Statements such as "my team and I and we" suffused the classroom. The researcher also observed how learners were eager to collaborate because they actively participated and could connect what they had learned in their previous lesson to the topic under study. Taqi and Al-Nouh (2014) believe this is owing to the fact that teamwork allows learners to achieve higher-order thinking skills such as creativity and retain knowledge longer than working individually. In the same breath, Erd and Al-Jabri, (2016) argue that that learners' interaction is an important asset that promotes creativity.

7.1.2 What are the physical factors that influence the reinforcement of creativity in Grade 9 Technology classroom?

Physical environment

This study also looked at the physical factors that influence the reinforcement of creativity in Grade 9 Technology classroom. The data revealed that teachers had challenges including inadequate resources and tools, limited allocated teaching time as well as overcrowded classrooms. Following are the teachers' responses.

> **Teacher A:** Factors such resources as drawing boards for designing the models, technological equipment and hand-outs on the walls.
> **Teacher B:** Overcrowded classroom and insufficient resources really impede learners' creativity. My class consists of 68 learners and my period ends before I can attend to all their learning needs or before the learners even get to use the available resources such as components to build their own circuits, because they have to share. This inadvertently causes a situation whereby the learners have to, in my absence, do these hands-on activities at home in my absence.
> **Teacher C:** Besides the overcrowded classrooms, I have to strive to cover the syllabus within a limited time.
>
> **Teacher D:** I think resources and time have a great effect on the improvement of learners' creativity.
> **Teacher E:** Overcrowded classes, unavailability of resources and laboratory, time constraints, teacher-learner relationship, and relevant teaching methods are some of the factors.

From the above utterances it is observable that teachers have a huge challenge of developing learners' creativity due to challenges such as lack of resources, time and pressure and overcrowded classes. This has led to them being unable to expose learners to opportunities of engaging in practical activities, the actual building of the artefact. For instance, teacher E highlighted that in their school they have neither a laboratory nor the equipment, and this affects learners badly in terms of nourishing their higher order thinking skills. Teacher A also added that for creativity to be enhanced successfully among Technology learners, technological resources and tools should be provided. This is in coherence with the claim made by Dhurumraj (2013) that most public schools in South Africa lack proper laboratory facilities for technology hands on activities, and this makes learning difficult. In the same breath Janak (2019) notes that the shortage of classrooms, resources, and teaching materials is affecting the implementation of the Technology curriculum.

In her response, Teacher C stated that she has to struggle to cover the syllabus due to time constraints. A two-hour period is grossly insufficient for a subject such as Technology that places more emphasis on hands-on activities than theoretical knowledge. This response corroborates with Mapotse's (2015) findings that the challenges affecting Technology teachers created are external factors such as time allocation (of 8% per week). Teacher B also posited that his period ends before he can attend to all their learning needs. This is further worsened by the sharing of the limited resources by the learners. Resultantly, most of the hands-on activities that should take place in the school are done at home by the learners without the teacher's guidance or input.

Besides the resources, the teachers' classrooms were overcrowded, which is a huge concern because the effects of overcrowding are detrimental to effective learning in the Technology classroom. A large classroom reduces the capability of teachers to control learners in a classroom (Norazman, Ismail, Ja'afar, Khoiry & Ani, 2019) and results in poor academic quality. Teacher C had a situation with some learners chatting and some sleeping during the presentation. This was inevitable

because of the rowdiness of the classroom and her inability to manage the situation.

Some of the teachers used group work as a way to manage the overcrowding; they also improvised materials to stimulate and maintain the interest and excitement of students. Nonetheless, one could observe that in their bid to achieve these, valuable lesson time was lost because they spent most of the lesson time trying to control the groups. Hence, they had little time for teaching. Rashmi (2012) emphasised that; creativity can be fostered in a well-resourced, supportive and positive environment. Therefore, it is fair to conclude that none of the observed teachers' classrooms was conducive for the enhancement of creativity because overcrowding, inadequate time and resources hinder the aspects promoted by the physical environment element of the creative pedagogy – interaction, freedom and generation of effective ideas.

8 Conclusion

From the above results and discussion, conclusion can be made that grade 9 Technology teachers have a challenge of engaging their creative pedagogy when handling Mini-PAT. For instance, during observation, most teachers were unable to practice the creative teaching strategies recommended by Rashmi's creative pedagogy to facilitate their lessons. Teachers were also unable to correctly implement the design process when handling Mini-PAT. Those who did, only focused on investigation and design stages and they did not present case studies for learners to identify the problem before they solve it. The intention of a case study is to show learners that Technology is a subject that is close to the way the world works (Department od Basic Education, 2011). As a result, they failed to connect that particular Mini-PAT with the everyday reality. This practice hinders the enhancement of creativity in a sense that teachers do not know how to facilitate the practical component of the Mini-PAT following the design process. The purpose of Mini-PAT is to give learners the opportunity to develop and demonstrate their levels of ability through the design process (DBE, 2011). However, in the case of those teachers the learners were deprived of the opportunity to develop their skills.

The study revealed that the Technology teachers had challenges in terms of the physical factors that influence their reinforcement of creativity in the classroom. These challenges include overcrowding, resource deficit, time constraint, and syllabus coverage pressure. Technology practical activities need a learning environment which is manageable, in terms of teacher-learner ratio, equipped with educational resources, and adequate teaching time as encouraged by Rashmi (2012)'s creative pedagogy. However, the study discovered that most of the Technology teachers failed to support the development of learners' creativity by creating conducive learning environment for them. All these challenges have a major contribution on the current problem that we have of Technology teachers failing to equip leaners with creativity skills when facilitating Mini-PAT.

This study calls for the department of Basic Education to revamp the curriculum for Technology, especially as it concerns time allocation for a smooth incorporation of creativity in the classroom. It also encourages subject advisors to come with better ways of training teachers on how to apply their creative pedagogies and the design process when handling Mini-PAT. Lastly, it encourages Technology teachers to reflect on their teaching strategies with respect to creative thinking skills.

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The influence of socio-demographic factors and risky lifestyles on the criminal victimisation of students: The Case of a Kenyan University.

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ABSTRACT

Unlike crimes committed against tourists or police officers, the annual crime statistics released by the Kenya National Police Service do not reflect crimes committed against university students *per se*. While there is substantial evidence on the extent and characteristics of criminal victimisation in the general population, as well as among university students in America and the West, evidence on this subject in Sub-Saharan Africa is drawn from limited studies. To date, the extent and characteristics of criminal victimisation among university students in Kenya are yet to be examined. While using a quantitative approach and a survey research design, a sample size of 1717 respondents was randomly computed from a population of 17167 individuals at a peri-urban university, west of Kenya, to determine the relationship between victimisation and socio-demographic factors and risky lifestyle exposure characteristics. Findings indicate that socio-demographic variables such as age, marital status, employment status, and residence were significantly related to victimisation. Additionally, risky lifestyle activities such as frequenting bars, socialising with strangers, partying on and off campus, and abusing bhang (a derivative of cannabis) and alcohol were significantly related to victimisation. To reduce student victimisation, we recommend the design of effective victimisation reduction advertisements and investment in on-campus housing.

Keywords: Lifestyle exposure, Risk, Socio-demographic factors, University students and Victimisation

INTRODUCTION

Criminality is inevitable in any society, and the phenomenon continues to claim victims on a daily basis, as reported in the media (Aineah, 2017; Chacha, 2014; Otieno, 2022). Embedded in the social and economic structure of society and the individual pathology, criminal victimisation is a reality that society has to contend with, typically responding by developing measures and designing programmes to mitigate, manage, or prevent it. Unlike other life experiences that are mainly sought, planned and expected, victimisation is largely unavoidable, unforeseeable, and unexpected (Canadian Resource Centre for Victims of Crime (CRCVC), 2011). As a result, experiencing victimisation has a devastating impact on victims. According to CRCVC (2011), depending on an individual's situation, the impact of victimisation can manifest at five levels, physical impact (such as cuts, bruises, and broken bones), emotional impact (such as fear and anger), psychological impact (such as post-traumatic stress disorder and sleep disturbances), social

impact (such as social isolation and difficulties in building relationships), and financial impact (such as the cost of medical bills and replacement of merchandise).

In Kenya, the level of crime is on an upward trend. According to the National Police Service (NPS) (2016), in the year 2016, the police registered 76 986 criminal cases, representing an increase of six percent from the year 2015. In the same year, the number of personal crimes recorded was 19 911, representing 25.5 percent of the total crimes recorded in Kenya, while only 15 crimes committed against tourists were recorded, this being the lowest number of crimes recorded in the country by category. However, official records may not give accurate statistics on the number of crimes committed in any given society since many crimes go unreported (Daigle, 2018). This is a phenomenon that leads to the 'hidden' or 'dark' figures of crime. Various reasons influence victims' non and under-reporting of crime: victims may not appreciate that they have suffered harm; fear of re-victimisation from the Criminal Justice System (CJS); and a perception that the police will do nothing (Wolhuter, Olley, & Denham, 2009). Analysing the extent of victimisation is dependent upon the development and use of valid and reliable measures. Therefore, in order to remedy the shortcomings of official records, victimisation surveys are employed to determine the extent of victimisation and who are most likely to be victims (Daigle, 2018; Wolhuter et al., 2009).

Given the negative consequences associated with victimisation, there is a growing body of literature globally dedicated to the subject. "Research reveals that socially unequal groups, including women, minority ethnic communities, and the elderly, are more likely to experience both primary and secondary victimisation" (Wolhuter et al., 2009 p. 33). Here, we opine that university students too are the equivalent of individuals that fall under the category of socially unequal groups in society. They arguably experience unequal distribution in earnings, economic resources, and social capital. Furthermore, available official data also indicates that demand for university education in Kenya continues to surge as the population of students enrolled across Kenyan universities rose from 509 468 in the academic year 2019-2020 to 546 699 in the academic year 2020-2021, depicting an increase of 7.3 percent (Faria, 2021). While economists may perceive such an increase as a good sign for the future development of the country, a victimologist in turn understands that such high numbers of students potentially bring more offenders onto campus, resulting in an increase in potential victims and victimisation rates amongst students. For these reasons, university students deserve special attention in victimisation research.

Even with the above reasons, a review of official records on victimisation and empirical research reveal that this special group has continued to receive disproportionate attention both from policymakers and academics in Sub-Saharan Africa and particularly in Kenya, with exceptions stemming from the media. The media's attempts to characterize victimisation among university students as a pressing issue indicate that the phenomenon is escalating and reaching unprecedented levels, usually at the expense of students who, in some cases, lose their lives (see Aineah, 2017; Chacha, 2014; Otieno, 2022). Although critics may claim that crime stories and victims of crime are staple raw materials for the media due to their newsworthy attributes (Surette, 2011), it is equally important to reflect on the real intention behind these crime stories, which is essentially to bring attention to a society,

policymakers and academics of the plight of students as victims of crime.

Thus, it is acknowledged that the Kenyan media is leading the way in constructing crimes committed against university students in Kenya as a security issue that deserves immediate policy action, but attention from academics and policymakers, has sadly lagged behind in this regard.

Away from the apprehensions of critics of the media's crime stories, what should be of concern is that the intended audience of crime stories, such as policymakers and academics, have not accorded this subject the attention it deserves. For instance, the scantiness of data on crimes committed against university students is reflected in the annual crime reports released by the NPS. These reports indicate that 15 crimes committed against tourists were recorded in 2016 as well as in 2017, and that number rose to 93 in 2018, a 520% increase. However, crimes committed against university students were overlooked in the annual crime reports (see, e.g., NPS, 2016; NPS, 2018). Undoubtedly, from NPS annual crime reports, we have an idea of rates and trends of crimes committed against tourists over the years, but rates and trends of crimes committed against university students cannot be determined from the available official crime reports.

Equally, empirical efforts to characterise victimisation among university students in Kenya are scarce; there is little to report on rates, extent and nature, as well as characteristics of victimisation among university students. In Kenya, formative studies on the subject of victimisation examined violent victimisation in the general population (e.g., Fry, 2015; Ndung'u, 2012; Parks, 2014). Other Kenyan researchers has examined violent victimisation among adolescent girls (Kabiru, Mumah, Maina, & Abuya, 2018), while others have focused on farm crime victimisation involving rural farmers (Bunei & Barasa, 2017; Bunei, Rono, & Chessa, 2013). While there is an existing body of knowledge in America and the West on the subject of victimisation in the general population (see e.g., Bunch, Clay-Warner , & Lei, 2015; Kaakinen, et al., 2021; Van Kasteren, 2016), missing persons (see, e.g., Ferguson, Elliott, & Kim, 2023), high school students (see, e.g., Cho, Hong, Espelage, & Choi , 2017), as well as among university students (see, e.g., Coulter, Mair, Miller, & Blosnich, 2017; Fisher & Wilkes, 2003), evidently, we know little about the rates, extent, nature, and characteristics of victimisation among Kenyan university students. Theoretically, the available literature in Kenya implies that criminal victimisation has been examined through different theoretical lenses. Victimisation has been understood from a routine activity approach (Bunei & Barasa, 2017; Bunei, Rono, & Chessa, 2013), crime prevention through environmental design (CPTED) approach (Fry, 2015), social disorganization (Parks, 2014). and through an integrated proposition of lifestyle-routine activities approach (Ndung'u, 2012).

From these Kenyan studies, it is strikingly obvious that no study has examined victimisation in the general population as well as among university students through the lens of the lifestyle exposure perspective. But even more surprising and of significant importance is that scholars have continued to examine victimisation from the integrated perspective of lifestyle-routine activities theory (LRAT), contending that lifestyle exposure and routine activities perspectives have the same theoretical appeal (e.g., Cho et al., 2017; Fisher & Wilkes, 2003; Ndung'u, 2012). Here, we argue that the two perspectives are dissimilar, but their inherent differences have been masked over the years. The lifestyle exposure perspective is concerned with

explaining the probability of victimisation, i.e., that the odds of getting victimised increase with engagement in certain lifestyles and behaviours, in particular risky lifestyles. The routine activities theory seeks to explain the victimisation event itself - the idea that victimisation will only ensue when three factors converge in space and time, that is, a motivated offender, an attractive target, and the lack of guardianship. If one element of the routine activities theory is missing, no victimisation will materialise (for a detailed discussion, see Pratt & Turanovic, 2016).

Considering the preceding discussion, it can be concluded that criminal victimisation involving university students is a serious issue at universities and requires further examination. Thus, the initial analysis of the phenomenon requires an examination of its frequency and the socio-demographic features that influence the likelihood of becoming a victim of crime, using more valid and reliable measures such as victimisation surveys. Additionally, according to the premise of lifestyle exposure theory, because individuals are involved in obligatory and discretionary activities on a daily basis, they establish certain lifestyles. Lifestyle exposure theory denotes that these daily activities pursued by individuals predict their risk of victimisation (Ferguson, et al., 2023; Goldstein, 1994). Thus, lifestyle characteristics of an individual escalate or diminish an individual's likelihood of becoming a target of victimisation (Bunch, et al., 2015; Ferguson, et al., 2023; Lee & Hilinski-Rosick, 2012). Therefore, engaging in a risky lifestyle propels ones' likelihood of encountering victimisation. Thus, from the perspective of the lifestyle exposure theory, the purpose of this research was to fill the existing empirical and theoretical gaps on the victimisation of university students in Kenya. Therefore, it was guided by the following research question: What is the extent of victimisation among students at Masinde Muliro University of Science and Technology (MMUST) in Kenya? Given that efforts to reveal the characteristics of student victimisation are narrow, the study also sought to determine the relationship between the socio-demographic factors and victimisation of students. Another objective was to find the relationship between students' lifestyle exposure attributes and victimisation.

LITERATURE REVIEW

Generally, criminologists and victimologists refute the idea that victimisation is random and acknowledge that some people are more likely to be victims than others (Fisher & Wilkes, 2003; Ndung'u, 2012). Thus, some scholars observe that a combination of demographics and lifestyle characteristics of an individual influence one's chances of encountering victimisation (Bunch et al., 2015; Ferguson et al., 2023; Ndung'u, 2012). By implication, encountering victimisation is dependent on one's lifestyle choices. Here, we draw upon existing empirical evidence and the lifestyle exposure theory of victimisation to analyse the relationship between demographics and lifestyle characteristics and the victimisation of students. But before delving into this relationship, we examine what we know about the extent of victimisation, both in general and among the university population in Kenya.

Extent of victimisation

According to Natarajan (2016 p.1), "it could be argued that many of the most serious crime problems are now to be found in developing countries, yet these problems have received only scant attention from criminologists and crime scientists, most of whom work in developed or Westernized nations." Research on victimisation in Kenya is limited. Results from a victimisation survey carried out in Kenya by the United Nations Office on Drugs and Crime (UNODC) (2010) indicated that at a household level, 22 percent of Kenyans were victims of motor vehicle theft, 13 percent

experienced cattle or animal theft, nine percent were victims of car hijacking, six percent were victims of burglary, and five percent experienced car vandalism. At an individual level, 22 percent of Kenyans encountered consumer fraud, 15 percent were victims of corruption, ten percent were victims of personal theft, five percent experienced assault, four percent experienced robbery, and just over one percent were victims of sexual offences (UNODC, 2010). In yet another study on violent victimisation and aspirations-expectations disjunction among adolescent girls in urban Kenya, Kabiru et al. (2018) established that 798 (33.8 percent) of the respondents had experienced at least one form of violent victimisation, of which 145 (6.1 percent) were victims of sexual violence.

Available data indicates that between January and June 2016, the security department at MMUST recorded a total of 136 crimes involving students. Thirty-seven percent of the crimes recorded involved theft, 12 percent involved assault, just over four percent involved corruption and abuse of office, almost 4 percent involved trespassing, almost 3 percent involved breach of contract, and less than one percent involved kidnapping (MMUST, 2016). However, the statistics incorporated all crimes committed against the institution and other individuals, and no attempts were made to specifically record and analyse crimes committed against students. In addition, the statistics included some transgressions that would ordinarily be categorised as civil wrongs, such as breach of contract. Although notoriously incomplete and inaccurate, according to these records, it appears that victimisation at MMUST is not widespread. Although there is empirical evidence to indicate that Kenyans encounter victimisation, available literature indicates that little has been analysed regarding victimisation among university students in Kenya. Thus, the research also explores the extent of victimisation among students at MMUST.

Demographic characteristics of victims

In the general population, the probability of experiencing victimisation is linked to certain demographic features, also referred to as individual risk factors (Bunch et al., 2015; Mclytyre & Widom, 2011). For instance, drawing from the findings of victimisation surveys in England and America, being a young, single black male is linked to more encounters with victimisation (Fisher & Wilkes, 2003). In the general population of the United States, victims of property crime are likely to be males, singles, urban dwellers, and members of black households living in rental properties (Johnson & Kercher, 2009). In a study across 14 European countries, findings revealed that, on a personal level, being young and an immigrant was a predictor of hate crime victimisation, while being more educated increased the odds of being a hate crime victim at a community level (Van Kasteren, 2016). Other researchers find that being a young, single male with low income is related to victimisation through the mediating effect of routine activities (Bunch et al., 2015). However, contrary to the expected theoretical interpretation of the lifestyle exposure perspective, Ferguson et al. (2023) found that the risk of victimisation of missing persons was a factor of being a female, a child, or young and elderly. While examining the predictors of violent victimisation in the general Kenyan population, Fry's (2015) findings showed that among the demographic variables employed in his study, only education was a significant predictor of violent victimisation, with low education attributed to the likelihood of experiencing violent victimisation. In another study (Ndung'u, 2012), young, single, and educated individuals encountered more risk of violent victimisation, but that risk varied across

income groups and gender. In yet another study of victimisation in the general population in Nairobi, being young, female, and married increased the odds of experiencing victimisation from a family member, but being a male increased the odds of encountering violent stranger victimisation (Parks, 2014). Inconsistent with Ndungu's research and in support of Fry's research, Parks' (2014) findings show that educated persons were less likely to experience victimisation compared to uneducated individuals.

Regarding student victimisation, a lingering question is: Do characteristics of victims of crime in Kenyan universities mirror those established in the general population? Some of the demographic factors linked to the probability of being a victim of crime in the general population might differ markedly from those identified among specific groups, such as university students. In a study on victimisation involving students at seven Texan universities, American Indian/Alaskan Native students were significantly more likely to experience victimisation, contrary to findings established in the general population (Johnson & Kercher, 2009). In the same study, and in line with findings in the general population, being a male, single or cohabiting, and a full-time student was linked to the likelihood of being a victim of crime. However, academic standing was insignificantly connected to the probability of victimisation (Johnson & Kercher, 2009). Findings in a United States Department of Justice study, to examine the socio-demographic characteristics of college students associated with violent victimisation, revealed that being a white male was associated with high rates of violent victimisation (Bureau of Justice Statistics, 2005). Additionally, although residing on or off campus was linked with a high frequency of violent victimisation, the majority of those who lived on campus also encountered victimisation while off campus. In a comparative study between British and American students, contrary to findings from national victimisation surveys, in the British sample, being a male was likely to reduce the odds of victimisation (Fisher & Wilkes, 2003). So far, empirical evidence in support of the relationship between socio-demographic factors and victimisation, appears to be mixed. Thus, identifying who among the students is likely to be a victim of crime is significant, as it might enable university administrators to develop programs that educate students about the possibility of victimisation and protective strategies that can be adopted to prevent further or re-victimisation.

Lifestyle exposure characteristics and criminal victimisation

At the core of the lifestyle exposure perspective is the idea that risky lifestyles are a factor in personal victimisation (Hindelang et al., 1978). It is further observed that, although not a guarantee that victimisation is going to ensue, engagement in risky behaviours, such as frequenting bars and stealing, enhances the possibility of victimisation (Pratt & Turanovic, 2016). Thus, participating in risky behaviours implies an enhanced probability of experiencing victimisation. From the perspective of lifestyle exposure theory, since individuals who engage in risky behaviours are at increased risk of victimisation, they should encounter victimisation more often.

Outside of Kenya, modern studies in the America and the West have revealed that engagement in lifestyle activities considered to be risky, such as abusing drugs, drinking, and frequenting clubs and bars, increases the probability of an individual's exposure to victimisation (Lee & Hilinski-Rosick, 2012; Messon-Moore, Coates, Gaffey, & Johnson,

2008; Pratt & Turanovic, 2016). But efforts to test the lifestyle exposure perspective in the general population and among university students in Kenya remain undocumented.

Although media crime stories point to rising crimes committed against university students, it is not clear whether university students' risky lifestyles are linked to their victimisation. However, a study conducted by Parks (2014) using 2000 Nairobi Cross-sectional Slum Survey data to test the utility of social disorganisation theory supports the idea that risky behaviours are related to victimisation. In that study, Parks included the following risky behaviours as control variables: alcohol consumption, violent offending, drug use, and friends' drug use. Findings revealed that violent offending, alcohol consumption, and friends' drug use increased the odds of encountering violent stranger victimisation. Violent offending too increased the likelihood of experiencing victimisation from a family member, but drug use was not related to victimisation. Drawing on these findings, we enrich the empirical evidence base by testing the applicability of the lifestyle exposure perspective in explaining victimisation among a unique segment of the general population – university students.

THEORETICAL FRAMEWORK

This study was guided by the lifestyle exposure theory. Hindelang, Gottfredson, and Garofalo (1978) propounded the lifestyle exposure perspective, the idea that individuals' exposure to victimisation can be attributed to their lifestyle patterns. Consequently, an individual's risk of becoming a target of victimisation, increases or decreases depending on a person's lifestyle characteristics (Lee & Hilinski-Rosick, 2012). Therefore, because of their lifestyle characteristics or patterns, some individuals are more prone to victimisation than others (Vakhitova, Reynald, & Townsley, 2016).

According to Hindelang et al. (1978 p. 241), "lifestyle constitutes one's routine daily activities, both vocational (attending school and working) and leisure (for example, frequenting bars and partying with friends away from home)." As advanced later by Robinson (1999), lifestyles comprise of obligatory (they must be undertaken) and discretionary (they are pursued by choice) activities that people engage in on a daily basis. For instance, an individual has a limited choice to undertake vocational duties (by attending classes) but has a great deal of discretion to engage in leisure activities (by going out to party). "Obligatory and discretionary activities have duration, position in time, a place in a sequence of events, and a fixed location or path in space" (Chapin, 1974 p. 37). As a result, victimisation is not distributed randomly across space and time. Consequently, "there are high-risk locations and time periods" (Pratt & Turanovic, 2016 p. 336). From this perspective, the probability of a person becoming a victim of crime is elevated if the person's lifestyle patterns bring the individual into contact with a likely offender (Vakhitova et al., 2016). Victimisation is thus a "function of exposure to high-risk times, places and people" (Hindelang et al., 1978 p. 245).

Kennedy and Forde (1990 p. 208) summarised the lifestyle exposure, such that "it encompasses differences in age, sex, marital status, family income, and race, which in turn influence daily routines and ultimately vulnerability to criminal victimisation. Accordingly, due to disparities in lifestyles, the youth, men, singles, minority groups and the unemployed, would be expected to report higher risks of criminal victimisation, because of their increased exposure to it (Lee & Hilinski-Rosick, 2012).

For this reason, some scholars claim that the lifestyle exposure perspective posits that the chance that one will be exposed to offender or criminal situations, can be linked to an individual's lifestyle, which in turn is a factor of one's socio-demographic characteristics (Ndung'u, 2012). However, according to Pratt and Turanovic (2016), as originally conceptualised by Hindelang et al. (1978), the youth, men, minority groups, singles, and the unemployed were hypothesised to have different lifestyles and routines that brought them into contact with potential offenders compared to their counterparts. Hence, it was not the mere socio-demographics of individuals but the differences in lifestyles that were linked to varying degrees of risk of criminal victimisation (Bunch et al., 2015; Ferguson et al., 2023; Pratt & Turanovic, 2016). For instance, gender differences in victimisation rates are explained in terms of lifestyles: males are more likely to venture outside the home and be predisposed to risky situations than their female counterparts (Ferguson et al., 2023). Therefore, the youth, men, singles, and minorities were assumed to be proxies for engagement in risky lifestyles.

Although scholars indicate that Kenyan university students report engaging in a wide range of risky lifestyles, such as substance abuse (Magu, 2015), efforts to test the lifestyle exposure theory in Kenya have been limited. Thus, from a lifestyle perspective, it is expected that young, single, employed male students residing off-campus as well as those engaging in risky lifestyles should report experiencing more victimisation.

METHODOLOGY

Participants and procedures

The cross-sectional data for the present study came from a victimisation and fear of crime survey conducted in April of 2017. Utilising a survey research design, a sample size of 1717 respondents was randomly computed from a population of 17167 individuals at a peri-urban university, west of Kenya. Immediately after class sessions ended, paper questionnaires were administered to the sampled students. In addition, each respondent signed a Letter of Informed Consent in which the purpose and benefit of the research were explained. It also stated that their anonymity would be protected and confidentiality ensured. The questionnaire for the study contained closed-ended questions. Respondents took approximately fifteen minutes to complete the survey. A total of 997 respondents participated in the study, representing a response rate of 58.07 percent. Data was analysed using the Statistical Package for Social Sciences (SPSS) computer program for Windows 22.0. Given the categorical nature of the cross-sectional data for the study, chi-square was used to test the relationship between independent variables and the dependent variable of the study.

Sample

The sample was made up of more male respondents (55.7%) compared to females (44.3%). The majority of respondents (73%) in the study were aged 24 years and below, while 27 percent were aged 25 years and above. The majority of respondents (58.1%) resided in off-campus housing, 27.8 percent on campus, while 13.9 percent lived at home with their parents. A large proportion of respondents (32%) were first-year undergraduate students, 26.5 percent third-year were undergraduate students, 19.1 percent were fourth-year undergraduate students, 18.5 percent second-year undergraduate students, and four percent were from other academic standings. More than half of the respondents (53.4 %) were not in employment, 32 percent were in part-time employment and 14.6 percent of the respondents were in full-time employment.

The majority of respondents (44.6 %) were single, 28.9 percent were cohabiting, and 22.1 percent of respondents were married, while 4.4 percent were either divorced or separated. The sample distribution regarding key socio-demographic variables is representative of the population at MMUST and general trends in Kenyan universities.

Dependent variable

The dependent variable for the study, criminal victimisation was measured by asking a respondent whether, in the last six months preceding the study, they had been personally victimised by crime or criminally offended. It was measured as a binary variable, with response categories of yes or no. Encountering victimisation was coded 1, and having not encountered victimisation was coded 0.

Independent variables

Borrowing from previous victimisation research, several socio-demographic and risky lifestyle variables were included in the study. From previous research, we know that a typical victim is a young, black-male who is single and lives on campus. Race was not measured given that it is an insignificant variable in the Kenyan context, but economic status and academic standing were measured. Six socio-demographic variables were measured: age, gender, relationship status, residence, economic status, and academic standing. Dichotomous variables were created for sex (female/male), age (<24 years/>24 years), relationship status (single/not single), residence (on campus/off campus), economic status (employed/unemployed), and academic standing (freshers/non-freshers). Consistent with the interpretation of the lifestyle exposure perspective, students' risky lifestyle characteristics that elevated their likelihood of victimisation were included in the study. It was hypothesised that students who frequent bars or pubs, socialise or party with strangers, go out alone at night, consume enough alcohol to get drunk, smoke bhang or take hard drugs, party on-and-off campus, and commit vandalism and theft predisposed themselves to the likelihood of victimisation. The seven variables were measured on a seven-point scale: (0) never, (1) once in the last six month, (2) less than once a month, (3) once a month, (4) once or twice a week, (5) more than twice a week, (6) daily or almost daily, and (9) don't know. Each of the seven variables was recoded into a dummy variable (no/yes).

RESULTS

In general, from Table 1, 38.27 percent of the respondents were direct victims of crime, while 18.55 percent were indirect victims. Findings also reveal that sampled students at MMUST experienced direct victimisation, more than vicarious victimisation.

Table 1 Extent of victimisation

Direct victimisation		Vicarious victimisation	
Prevalence of victimisation	%	Prevalence of victimisation	%
No	61.73%	No	81.45%
Yes	38.27%	Yes	18.55%

Table 2 shows the results of the relationship between socio-demographic variables and victimisation. Age, residence, relationship status, and employment status

showed a statistically significant relationship with victimisation, *P* value < .005. Students aged <24 years, residing off-campus, employed, and in a relationship were more likely to experience victimisation than their counterparts. No significant statistical difference in victimisation by gender and academic standing was established, *P* value >.005, denoting that there was no relationship between gender, academic standing, and victimisation. The results might imply that age, residence, relationship status, and employment status are predictors of victimisation among university students.

Table 2: Socio-demographic and victimisation

Variable	Victimisation		Total	***P*** value
	No	Yes		
Gender				
Male	332 (60.3%)	219 (39.7%)	551	0.077
Female	243 (54.5%)	203 (45.5%	446	
Age				
<24 years	353 (48.5%)	375 (51.5%)	728	0.000
>24 years	222 (82.5%)	47 (17.5%)	269	
Residence				
On-campus	248 (89.5%)	29 (10.5%)	277	0.000
Off-campus	327 (45.4%)	393 (54.6%)	720	
Relationship status				
Single	328 (67.1%)	161 (32.9%)	489	0.000
In a relationship	247 (48.6%)	261 (51.4%)	508	
Employment status				
Employed	244 (52.5%)	221 (47.5%)	465	0.002
Unemployed	331 (62.2%)	201 (37.8%)	532	
Academic standing				
Freshers	191 (59.9%)	128 (40.1%)	319	0.370
Non-freshers	384 (56.6%)	294 (43.4%)	678	

In Table 3, the results of the relationship between risky lifestyles and victimisation are shown. In summary, a statistically significant relationship between frequenting bars or pubs, socialising with strangers, consuming enough alcohol to get drunk, smoking bhang and abusing hard drugs, and partying on-and-off campus and victimisation, *P* value<.005 was established. Those who frequent bars or pubs, consume alcohol to get drunk, and party on-and-off campus are more likely to encounter victimisation. Shockingly, those who do not socialise with strangers and do not smoke bhang and use hard drugs have a high likelihood of becoming victims of crime. No statistically significant relationship between victimisation and going out alone at night and committing vandalism and theft was detected, *P* value >.005.

DISCUSSION

The first objective of the study was to determine the extent of victimisation among students, while the second objective sought to determine the relationship between the socio-demographic characteristics of university students and their victimisation experiences. The third objective of the study was concerned with establishing the relationship

between students' risky lifestyles and victimisation encounters.

Table 3: Risky lifestyle characteristics and victimisation

Variable	Victimisation		Total	*P* value
	No	Yes		
Frequenting bars and pubs				
No	214 (72.5%)	81 (27.5%)	295	0.000
Yes	354 (50.9%)	341 (49.1%)	695	
Socialising with strangers				
No	191 (40.6%)	280 (59.4%)	471	0.000
Yes	384 (74.0%)	135 (26.0%)	519	
Going out alone at night				
No	47 (58.8%)	33 (41.3%)	80	0.567
Yes	446 (54.7%)	369 (45.3%)	815	
Consuming enough alcohol to get drunk				
No	281 (86.2%)	45 (13.8%)	326	0.000
Yes	229 (47.4%)	254 (52.6%)	483	
Smoking bhang and using hard drugs				
No	316 (46.6%)	362 (53.4%)	678	0.000
Yes	240 (85.4%)	41 (14.6%)	281	
Partying on and off campus				
No	56 (88.9%)	7 (11.1%)	63	0.000
Yes	512 (56.8%)	389 (43.2%)	901	
Committing vandalism and theft				
No	207 (55.5%)	166 (44.5%)	373	0.313
Yes	368 (59.0%)	256 (41.0%)	624	

With regard to victimisation, contrary to the common notion that universities are safe havens, a major finding under this objective was that students at MMUST were not protected against victimisation as they encountered victimisation similar to other individuals in the general population. However, direct victimisation among students at MMUST was more prevalent (38.27%) than indirect victimisation (18.55%). Indirect victimisation among students at MMUST is not overly pronounced, however, the finding that more than a third of the respondents had experienced direct victimisation should raise concerns.

National victimisation surveys in America and England reveal that in the general population, a typical victim is a young, single, black, male (Fisher & Wilkes, 2003). Though results are inconsistent, drawing on the results obtained from national victimisation surveys, among university students, the general expectation is that a victim of crime should be young, single, black, and male residing on-campus. In addition, employed students and those in their first year should be more predisposed to victimisation. A review of some of the findings emanating from the present study support those established previously. Consistent with national victimisation empirical findings on personal characteristics

and victimisation, young and employed students were more likely to encounter victimisation. Unexpectedly and contrary to established research findings, students residing off campus and those in a relationship had a high probability of becoming victims of crime, while gender and academic standing showed no statistically significant association with victimisation.

Mixed results on the relationship between personal characteristics and victimisation in the current study mirror those of other scholars. While examining violent victimisation in the Kenyan general population, Fry (2015) found that, among all demographic variables, only education was related to violent victimisation. Nonetheless, in the Kenyan general population, young, single, and educated individuals were more at risk of violent victimisation, while the risk of violent victimisation varied across income groups and gender (Ndung'u, 2012). Yet another study established that being young, female, and married increases the odds of being victimised by a family member, but being a male increases the odds of being victimised by a stranger (Parks, 2014). In another study, being a young, single male with low income was connected to victimisation through the mediating effect of routine activities (Bunch et al., 2015). Yet, Ferguson et al. (2023) established that being female, a child, or young and elderly increased the odds of victimisation. In line with our findings, Kaakinen et al.'s (2021) findings revealed that being in a relationship was positively linked to sexual victimisation by peers. The same observation can be made among university students. While comparing the risk of victimisation for violence, theft, and burglary between American and English university students, Fisher and Wilkes (2003) found that only gender was a significant predictor of property theft victimisation in the sample from England. Evidently, findings on the relationship between demographics and victimisation appear to be inconsistent, and more research will be required in the future to determine the direction of the relationship.

But what might explain inconsistent results in this study, one may ask? Focusing on gender and academic standing, two variables that did not yield a statistically significant relationship with victimisation, showed that two explanations are possible. Looking at gender in particular, males were expected to report more victimisation than their female counterparts, but instead, findings show that gender and victimisation are independent of each other. Unlike females who are confined at home, males are more likely to venture out and therefore more likely to be exposed to a motivated offender; as such, males should encounter more victimisation. While this argument makes sense when considering variations in gender roles in the general population, a university is a very different context. Usually, students are expected to lead an independent life, where one is expected to fend for oneself. Thus, in a university context, gender roles, expectations, and constraints would not be expected to lead to lifestyle differences between female and male students. As such, male and female students are likely to engage in risky lifestyle patterns.

Alternatively, as advanced by power control theorists, it is possible that a majority of students hail from families where both parents occupy near equal positions of power in the workplace, denoting that they exercise equal control at the family level, including control over their children (Siegel, 2011). Such parents tend to exercise less control over both female and male children. That is unlike the case in conservative families, where the father is the breadwinner and the mother performs household chores, leading the mother to exercise more control over the girl child than the boy child. With reduced

control over both genders, it is hypothesised that children, both males and females, growing up in egalitarian families are likely to have been socialised to hold similar perspectives in life, such as pursuing similar careers, risk taking behaviours, as well as patterns of criminal behaviour and victimisation (Siegel, 2011). Thus, it is possible that male and female students tend to have similar patterns when going out at night alone, which may explain the near equal chances of victimisation as revealed in the study. Indeed, a separate cross-tabulation between going out at night alone and gender, gives credence to this supposition. Ninety-three percent of males went out at night alone, while seven percent did not, compared to 89 percent of females who did go out at night alone and 11 percent who did not, although Chi square results showed statistically significant results (*P* value <0.05).

Regarding academic standing, those in the first year of study were expected to report higher rates of victimisation than students in other years of study. However, no relationship was detected between the two variables. Previously, it was noted that residing off campus was associated with a high probability of encountering victimisation and results from a crosstabulation between residence and academic standing reveal that 67 percent of students in the first year and 75 percent of students in other years of study lived off campus. Taking these findings into account, a possible explanation is that most students in their first year and in other years of study lived off campus, where they were likely to have similar patterns of victimisation. Again, while previous research has shown that living on campus is associated with a high risk of victimisation, this study shows the contrary. Thus, a deduction can be made that of those living on campus, 33 percent of students in their first year and 25 percent of students in other years of study tend to experience similar patterns and low rates of victimisation. As a result, it is conceivable that no statistical difference in victimisation would emerge across a year of study, as operationalised in the study. This is not to mean that no difference would be noted if academic standing was operationalised differently in another study.

Regarding objective three, the lifestyle exposure perspective argues that certain lifestyles, in particular risky lifestyles, expose one to risky situations, thereby elevating one's likelihood of encountering victimisation. It follows that those students who engage in risky behaviours, such as frequenting bars or pubs, mingling with strangers, consuming alcohol with the aim of getting drunk, smoking bhang and using other hard drugs, partying on-and-off campus, venturing out alone in the dark, and perpetrating vandalism and theft, predispose themselves to risky situations where they are likely to become victims of crime. The lifestyle perspective also acknowledges that engagement in risky lifestyles is not an assurance that one will be victimised but only elevates the odds of experiencing victimisation. Theoretically, some of the findings from the current study are in congruency with the theoretical expectations of the lifestyle perspective. Those who visit bars and pubs often, take alcohol to get drunk, and attend parties on-and-off campus had high chances of being victimised. Surprisingly, not socialising with strangers and not smoking bhang and using hard drugs raised the odds of encountering victimisation, while venturing out at night and committing vandalism and theft, resulted in an insignificant relationship with victimisation.

Earlier, it was noted that attempts to test the lifestyle exposure perspective have been scarce owing to a common misinterpretation that the principles espoused

by the perspective mirror those of routine activity theory. Rather than evaluate each perspective independently, since the two perspectives are inherently distinct (see Pratt & Turanovic, 2016), scholars usually combine the two into an integrated proposition of lifestyle-routine activity. While noting Pratt and Turanovic's (2016) concerns, the current study sought to examine the empirical utility of the lifestyle theory to explain victimisation among a sample of university students. While the findings may appear mixed, in the sense that some indicators of a risky lifestyle point to the possibility of a negative relationship or no relationship with victimisation, it should be noted that other scholars have registered similar results. For instance, in the previously mentioned comparative study, engaging in risky behaviours, such as frequent consumption of three or more alcoholic beverages did not predict risk of violence, theft, and burglary victimisation, for both cohorts. However, frequent abuse of recreational drugs was a significant predictor of violent victimisation for both groups, and a significant predictor of theft victimisation in the England cohort and burglary victimisation in the American group (Fisher & Wilkes, 2003). However, unlike our findings, Ferguson et al.'s (2023) findings showed that substance use and abuse increased the odds of experiencing victimisation by missing persons. Even with these mixed results, our research fills a theoretical, empirical, and contextual gap in the victimisation literature by making an initial attempt to explain victimisation from the perspective of lifestyle exposure while using a segment of the general population, university students – that has received little attention from Kenyan academics and policymakers.

However, it is acknowledged here that two victimisation perspectives – routine activity and lifestyle exposure perspective, have dominated victimisation research (Daigle, 2018). Now we know that other theories exist that account for victimisation. We also have clarity that the proponents of the lifestyle exposure perspective did not expect that all established individual lifestyle activities would enhance an individual's risk of victimisation. Rather, certain lifestyles, in particular risky lifestyles, should raise the odds of victimisation. And again, from the lifestyle perspective, there is no guarantee that a risky lifestyle will lead to victimisation, they only raise the probability of victimisation. Thus, when a finding is made that suggests engagement in risky behaviours, such as socialising with strangers and smoking bhang or abusing hard drugs, is not related to victimisation risk, we must turn to other victimisation theories to fill this gap. Consistent with this interpretation, some authors acknowledge that facilitators of victimisation are multifaceted (e.g., (Balogun, Akngabe, & Salihu, 2021). Therefore, future research may turn to these theories to develop our understanding of victimisation.

A cautionary approach is necessary and should be exercised when interpreting these findings, particularly because of the limitations of the study. First, surveys are beset by various problems, such as the misinterpretation of questions by respondents as hypothetical, rather than referring to actuality. Secondly, the operationalisation of the dependent variable requires consideration. Although attempts were made to tap into personal victimisation by asking respondents whether 'one' had been a victim of crime or had been criminally offended, research shows that a more precise measure would have been adequate. Thus, the empirical utility of the lifestyle exposure perspective should have been enhanced if respondents were asked about encountering a specific type of victimisation. For instance, had the study asked about experiencing

contact, property, cyber, or hate crimes, the results would have been different, but the measures employed in the research are dependent on the available data. Relatedly, we know that some individuals are victimised more frequently than others. Thus, more detailed information would abound, and the nature of the relationship between risky lifestyles and victimisation would be different if the research measured the frequency of victimisation in the past six months. Thirdly, the study used seven items to depict risky lifestyles; future researchers should benefit by including more indicators of risky lifestyles so as to enrich their findings. For these limitations, the conclusion reached should be approached in a cautious manner, taking into consideration these limitations, the available data, and the research context.

RECOMMENDATIONS

In line with our findings, we recommend the design of effective educational campaigns geared toward victimisation reduction among students at MMUST. In particular, victimisation reduction advertisements should be designed by the security department in conjunction with researchers at MMUST. "Victimisation-reduction campaigns strive to increase the use of personal crime prevention techniques by citizens" (Surette, 2011 p. 159). Thus, engagement in self-protective behaviours can be effective in reducing victimisation when students attend parties on-and-off campus. However, for students to adopt self-protective behaviours, victimisation-reduction campaigns should be designed to convey the risk of encountering victimisation, the likely severity of victimisation, the effectiveness of the recommended measures, and the cost of taking action as opposed to inaction (Surette, 2011). Given our findings show that students living off-campus are likelier to experience victimisation, we also recommend to the authorities at MMUST that they invest in on-campus housing.

CONCLUSION

Empirical evidence suggests that university students are not protected against victimisation. Experiencing victimisation seems to be a factor of being in a relationship, young, employed, and living off campus. This work adds to the existing body of knowledge in the utilisation of lifestyle exposure theory. Regarding risky lifestyle, it can be concluded that frequenting bars or pubs, consuming alcohol to get drunk, and partying on-and-off campus predisposes individuals to victimisation. Finally, the mixed results obtained from the research on the characteristics of victimisation mirror findings elsewhere. However, given the inconsistent findings and the limitations of the research, the reader should exercise more caution while reaching such a conclusion.

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The Adoption of Blended Learning by Rural-Based Institutions of Higher Learning in South Africa Amid Covid-19: Experiences and Challenges

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ABSTRACT

Many institutions of higher learning were forced to adopt blended learning since the outbreak of coronavirus disease (Covid-19). The adoption of blended learning amid Covid-19 has delayed learning processes in most rural-based institutions of higher learning in South Africa. Thus, the study has adopted a non-empirical research design: a systematic review, and it was conducted to establish solutions to blended learning challenges faced by rural-based institutions of higher learning in South Africa amid Covid-19. Conversation theory was adopted in this study because it advocates that students should get the opportunity to interact with the lecturers, which could help to amend the digital divide and promote advanced blended learning in rural-based institutions of higher learning. Therefore, the data for the study was obtained by using scientific search engines for articles and books. The study's articles were obtained from the computer-based scientific search engines Google Scholar, EbscoHost, ResearchGate, ScienceDirect, and Scopus. Thus, purposive sampling was used to select relevant articles rather than using any articles that had no bearing on the study. The secondary data was then analysed using thematic analysis. It was found that the delay in advanced blended learning was caused by the digital divide and barriers to digital transformation in rural-based institutions, among other challenges. It was recommended that the government should provide digital equipment to rural-based institutions of higher learning and provide training to all students and lecturers on how to use different technologies to ensure the accessibility of blended learning.

Keywords: Blended learning, Covid-19, higher learning, rural-based institutions, South Africa

INTRODUCTION

Education is an evolving and dynamic field. In the previous decades, it has always been associated with the physical presence of the institution, classrooms, examination hall, lecturer, textbooks and examination, among others (Ma'arop & Embi, 2012). Before blended learning and the Covid-19 outbreak, most higher academic institutions accepted e-learning as an alternative to traditional classroom teaching without any resistance. In this regard, Olawale and Mutongoza (2021) explained that internet-based learning during the Covid-19 pandemic is considered as an option given that it is an alternative to traditional learning, and it became an essential element for maintaining the activities in higher education institutions.

However, to ensure the effectiveness of e-learning, many institutions of higher learning across the globe are currently using blended learning for teaching and learning. According to Volchenkova and Bryan (2016), blended learning is a formal education programme in which a student learns, at least in part, through the online

delivery of content and instruction with some element of student control over time, place, path, and/or pace and, at least in part, at a supervised brick-and-mortar location away from home. Further, these authors explained that the origins of blended learning pre-date the advent of digital technology.

Thus, the era of Covid-19 and technological innovations has resulted in new trends in the learning environment and introduced a more modern and advanced conception of learning.

Since the outbreak of Covid-19 in China (Wuhan), the pandemic has had a massive impact on people's lives and habits (Fevale, Soro, Trevisa, Drago & Mellia, 2020). World Health Organisation (2021) explained Covid-19 as an infectious disease caused by a newly discovered coronavirus.

Wang, Hassan, Pyng and Ye (2022) explained that the epidemic crisis has disrupted education all over the world, and to ensure the continuous development of the teaching and learning process most institutions opted for a mixed method of combining online and face-to-face classes (blended learning). In the context of South Africa, Olawale and Mutongoza (2021) explained that Covid-19 has predominately caused a major disruption in the education sphere. According to the above-mentioned authors, for the first time, both students and lecturers in many developing countries including South Africa were required to communicate officially through an online platform for academic-related purposes. As a result, many educational institutions were forced to adopt blended learning. Yet, blended learning is ideal for the current terrain of the Covid-19 pandemic which requires learning modalities that promote social distancing to reduce the spread of the disease while ensuring that students have access to quality teaching and learning materials and frequently stay engaged (Muhuro & Kang'ethe, 2021). In this regard, Fevale *et al*. (2020) explained that the urge to respect social distancing and lockdown measures adopted to limit the spread of the infection led to a shift in the realisation and supply of a wide number of services, i.e. the shift to online lessons and the adoption of blended learning.

Blended learning, according to Muhuro and Kang'ethe (2021), has also become important during the outbreak of diseases such as Covid-19 where face-to-face teaching is prohibited to combat the spread of the disease.

Desirably, therefore, blended learning is an innovative endeavour that could benefit students in rural-based universities in Southern Africa (Muhuro & Kang'ethe, 2021). The statement above is supported by Mhlanga (2021:15) who explained that the Covid-19 pandemic created opportunities for the introduction of blended learning post-Covid-19, which can help to expand access to education in South Africa.

As Marwala (2021) sees it, the necessary move to modern modes of teaching and learning during the era of the Covid-19 pandemic has revealed what works and where institutions of higher learning need to refocus their efforts. Olawale and Mutongoza (2021) explained that while digital transformation is affecting and changing various sectors significantly, the education system is being encouraged to take advantage of new technologies and tools to develop strategies and actions to play an active role in the digital transformation process.

Related to what Marwala (2021) and Olawale and Mutongoza (2021) explained, Muhuro and Kang'ethe (2021) add that for many rural-based universities, successful blended learning implementation implies an exploration of possible ways to strengthen existing practices.

For Olawale and Mutongoza (2021), given that teaching and learning

have historically been confined to students gathering in the lecture halls to listen to lecturers or gathering around a table for discussion among their peers, technology innovation is challenging those traditional practices, thereby bringing about radical change to the higher education system.

Thus, there is a need for strategies to improve the working conditions of teaching at rural institutions of higher learning to ensure that there is improvement in terms of students' performance across the rural areas of South Africa.

STATEMENT OF THE PROBLEM

In his study, Dube (2020) revealed that Covid-19 and the implementation of blended learning have magnified the challenges faced by rural students and lecturers. Olawale and Mutongoza (2021) found that because blended learning has limited mechanisms for monitoring assessments, lecturers are often left unsure of how effectively they can measure students' learning abilities. From the above-mentioned statements, one could concur that the outbreak of Covid-19 has found teachers unprepared for using technologies to enhance the blended learning approach in higher education institutions.

Thus, teaching using new technologies, according to Dube (2020), is new to many students, especially those living in rural areas, which leads underprivileged students to fear that education during the time of Covid-19 will serve their counterparts students who have the privilege and who are connected to resources such as the internet and Wi-Fi. Without any doubt, it can be argued that students from rural-based institutions are still left behind in terms of using new technologies and this negatively affects their learning performance amid and beyond Covid-19.

Olawale and Mutongoza (2021) explained that based on challenges like the lack of internet connectivity, irregular electricity supplies, and the lack of technological resources which enable online learning, the rural and poor populations appear to be the most alienated from access to education. Similar to the above, UNESCO (2021) revealed that lack of connectivity and devices excluded at least one-third of students from pursuing learning remotely. The statement above shows that lack of connectivity also determines the performance of students when blended learning is adopted by rural-based institutions.

RESEARCH QUESTIONS

The research questions of this study are as follows:

- What is the importance of blended learning in institutions of higher learning amid Covid-19?
- What are the blended learning challenges faced by rural-based institutions of higher learning amid Covid-19?
- What are the solutions to blended learning challenges faced by rural-based institutions of higher learning?

THEORETICAL FRAMEWORK: CONVERSATION THEORY

The Conversation theory developed by Gordon Pask in the 1970s was adopted and used as a theoretical lens to ensure that there is flexibility in delivering education that integrates technology and digital media with traditional instructor-led classroom activities. In this regard, Bouman (2012) explained that traditional instructor-led classrooms are teaching in a style that is contradictory to the way students learn outside of the classroom.

According to Creswell (2014), theory in research may often serve as a lens

for the inquiry or it may be generated during the study. Leavy (2017) sees theory as an account of social reality that is grounded in data but extends beyond that data.

In the context of this study, Heinze and Procter (2007) explained that the Conversation theory depicts the communication process that occurs between the lecturer and student in the development of the student's knowledge. In this regard, one can concur that the adoption of blended learning as a result of Covid-19 means a reduction of face-to-face contact time, which reduces opportunities for face-to-face lecturer-student dialogue. In their overview of this theoretical approach, the aforementioned authors suggest that it is important that conversation should be encouraged and take place in a virtual space.

Using conversation as the basis for teaching, the learning relationship becomes more transparent and open to both the student and lecturer (Heinze & Procter, 2007). Based on what the above-mentioned authors indicated in the context of Covid-19, and with particular reference to rural-based institutions of higher learning in South Africa, one can argue that there is a need for students and lecturers to use conversation to promote social and learning conditions.

Laurillard (2002) is of the view that there is no one right medium for the conversation; each medium has its drawbacks and hence it is important to maintain the various dialogic aspects all the time. With the above-mentioned statement, one can suggest that lecturers should strike balance between face-to-face and virtual platform conversations so that students benefit from blended learning.

LITERATURE REVIEW

Importance of blended learning in institutions of higher learning

As far as the importance of blended learning in institutions of higher learning is concerned, Marwala (2021) believes that given the history of South Africa, a blended model is appropriate as it takes into account the unique circumstances of the student. Instead, Olawale and Mutongoza (2021) point out that this model brought about the use of a flipped classroom, which is a simple strategy for providing learning resources such as articles, pre-recorded videos, and YouTube links before the class. The above-mentioned authors also believe that the modern kind of learning deepens understanding through discussions among students.

In the study conducted by du Plessis, Jansen van Vuuren, Simons, Frantz, Roman, and Andipatin (2022), it was highlighted that institutions of higher learning familiar with blended learning shifted to this new kind of learning fully, and fairly swiftly, by employing the necessary tools, teaching practices and requirements for online learning. In this regard, du Plessis *et al.* (2022) indicated that in this case, the impact on students resulted in much less disruption to continue with their academic programmes.

Findings from the study conducted by Muhuro and Kang'ethe (2021) indicated that prospects of blended learning entail providing opportunities for flexible learning, enabling access to a wide range of educational resources, and limiting alienation associated with purely online education delivery. Similar to this statement, Perumal, Pillay, Zimba, Sithole, van der Westhuizen, Khosa, Nmngcoyiya, Mokone and September (2021) state that a large number of colleges and universities are transitioning to online or blended pedagogy due to the need to maintain a competitive edge and classes more

accessible to growing and diverse student population.

In the context of the importance of blended learning in institutions of higher learning, Mhlanga (2021) argues that the other unique feature of blended learning is that it takes advantage of different learning experiences that can be offered by using a mix of learning environments such as lectures, self-paced study, online collaboration, and communication exercises simulations and using interactive multimedia.

In their perspective, Muhuro and Kang'ethe (2021) explained that rural institutions benefit from using blended learning because they can hire part-time staff to offer some of the classes online and use social media platforms, mobile learning tools, and/or learning management systems to reduce the strain on staff having to repeat lessons for students who miss classes due to illness or other constraints. The above-mentioned authors believe that students benefit from blended learning as they can learn the materials at their own pace and can use other technological tools for further research to access important learning content that improves the student experience.

Another important aspect of blended learning is that to attain its benefits there is a need for a strong commitment from teaching staff and institutional support for their efforts (Mhlanga, 2021).

Blended learning challenges faced by rural-based institutions of higher learning amid Covid-19

The education sector was the most hard-hit as the virus demanded social distance making learning impossible in tertiary education (Mhlanga, 2021). Further, the study conducted by Mhlanga (2021) discovered that introducing blended learning is associated with challenges related to high levels of inequality, the massive digital divide, resource constraints, and skills shortages. This is supported by Dube (2020) who indicated that the greatest challenge faced with modern education is that an internet connection is very expensive and, in some cases, very limited. In this regard, UNESCO (2021) also found that since its outbreak two years ago, the Covid-19 pandemic has disrupted education systems and it has increased inequalities, and exacerbated a pre-existing education crisis.

As far as Marwala (2021) is concerned, while Zoom, Microsoft Teams, and even WhatsApp provided solutions, they failed to answer issues of inequality, inequity, and lack of success. Similarly, Mhlanga (2021) explained that one of the greatest challenges of switching to blended learning is the problem of inequality in South Africa. Further, Mhlanga (2021) argued that inequality in South Africa manifests itself through skewed income distribution and unequal access to opportunities that later cause disparities in almost every sector, education included.

According to Marwala (2021), data, Wi-Fi and access to smartphones and tablets, at the very least, are necessities for a complete transition to the new method of teaching and learning. To this end, one can concur that rural-based institutions of higher learning in South Africa are seemingly helpless on how to approach blended learning during the Covid-19 lockdown.

In their study, du Plessis *et al.* (2022) also revealed that the challenges surrounding the new kind of learning highlighted the inequalities at higher education institutions and demonstrated that South Africa may not be prepared for the 4th industrial revolution (4IR). Further, du Plessis *et al.* (2022) revealed that the Covid-19 pandemic exposed the inequalities within and between universities as some institutions were ready to move to

a new kind of teaching and continue with the academic term, whereas others faced severe constraints related to students' poor access to technology and poor socio-economic circumstances.

As a result of the outbreak of the Covid-19 and adoption of blended learning, Olawale and Mutongoza (2021) revealed that most institutions of higher learning have witnessed high rises in students' academic dishonesty, and in most cases, they simply do not have effective mechanisms to combat this illicit behaviour. Most importantly, the above-mentioned authors explained that owing to Covid-19-induced learning, most institutions do not have measures that regulate academic integrity online. Thus, lecturers are often left to believe in the honesty and independence of students in doing assignments, thus institutions often bemoan the rise of contract cheating where assignments and tests are increasingly being done for students by 'ghost writers' at a price.

Pertaining to lecturers, Lassoued, Alhendawi and Bashitialshaaer (2020) discovered that lecturers have become accustomed to traditional teaching and favoured it for many years without thinking about the new method of teaching i.e. blended learning. According to du Plessis *et al.* (2022), those institutions that were much less prepared for the new kind of learning struggled to upskill academic staff and students, and at the same time needed huge investments in technology to effect the change to blended learning. In addition, Olawale and Mutongoza (2021) indicated that for many lecturers, the Covid-19 pandemic is a transformative challenge in which there is no specified guide for an appropriate response when they communicate through an online platform with their students.

According to Marwala (2021), lack of data, Wi-Fi, and access to digital devices, among others, negatively affect the new kind of learning. Similar to the above, Muhuro and Kang'ethe (2021) found that many institutions have constraints related to unstable or non-existent network coverage characteristics in rural locations, and curricular deficits stemming from the blended learning model not aligning to context, thus lowering morale for wider implementation. The above-mentioned constraints according to the authors are exacerbated by weak goodwill and limited policy guidelines on a specific blended learning model. Also, du Plessis *et al.* (2022) explained that the lack of inclusion of institutional documentation such as protocols or policies that address the Covid-19 pandemic is a challenge. Further, the above-mentioned authors accentuated that whilst this would have provided insight into how South African higher education institutions made sense of the Covid-19 pandemic from the institutional perspective, these policies did not exist or are only in development as higher education institutions navigate the unprecedented and unpredictable nature of the Covid-19 pandemic.

Mhlanga (2021) explained that many students in rural areas were excluded from teaching and learning due to challenges related to resource constraints such as lack of internet access, absence of learning management systems, and low-tech software. The author revealed in his study that apart from challenges related to resources, students were also concerned with future professional careers and studies and a lot of them experienced boredom anxiety, and frustration due to the various hygienic practices that were practised and the various restrictive measures that were imposed by the government.

Unpacking the blended learning challenges faced by rural-based institutions of higher learning amid Covid-19 in South Africa, Mhlanga (2021) explained that when educators do not have digital literacy

skills, it will be very difficult for blended learning to achieve meaningful results.

Plausible solutions to blended learning challenges faced by rural-based institutions of higher learning

Before planning, designing, and implementing blended learning there is a need to assess the environment. In his study, Dube (2020) argues that in the time of Covid-19, the traditional approach to teaching is no longer permissible, and there is a need to invent new ways of teaching, which, unfortunately, is new to many students in rural areas, leading to the fear that education during the time of Covid-19 will serve a few privileged students who are connected to resources.

Based on the findings of his study, Dube (2020) suggests that rural lecturers and students should have access to data. With the availability of data, one can concur that this could help both lecturers and students to engage in the blended learning process, especially if they are not going to have face-to-face lectures. This, of course, could also mitigate learning challenges caused by the outbreak of Covid-19 in the South African education system, particularly at rural-based institutions of higher learning where there is a lack of digital education tools for lecturers and students.

Marwala (2021) explains that data, Wi-Fi, and access to devices, at the very least, are necessities for a complete transition to this kind of new learning. In this regard, Lassoued *et al.* (2020) state that institutions of higher learning need to take advantage of developments in communication technology and use them to provide their curricula to those who wish to continue their higher education anytime, anywhere.

Recommendations from the paper presented at the 12th Annual AISA International Interdisciplinary Conference by Sundani and Mangaka (2021), posit that to avoid the digital divide and lack of provision of teaching and learning in the era of Covid-19, the South African government should provide Wi-Fi, digital devices and data to students and lecturers, especially from rural-based institutions.

Related to what Sundani and Mangaka (2021) suggested, Olawale and Mutongoza (2021) believe that the South African government should ensure the availability of effective communication tools and promote technology-enabled learning for students capable of bridging the digital divide that exist both in the community and in the education system. In the context of the provision of resources, the study conducted by Muhuro and Kang'ethe (2021) recommends governmental support for resourcing rural universities to acquire affordable and usable resources to offset challenges hindering blended learning. Further, the two authors recommend that rural institutions should also strive to strengthen support to students and staff to build confidence in the potential of blended learning. As suggested by these authors, the digital divide should be dealt with by the government so that blended learning can be implemented in rural-based institutions of higher learning.

Further, Marwala (2021) explained that higher education institutions will remain pivotal for engaging in meaningful action to contribute towards local, national, and global debate through this kind of new learning approach. Like other higher education institutions, universities must continually revisit their strategic plans and curricula to ensure constructive alignment with a rapidly changing society.

Further, the paper presented by Sundani and Mangaka (2021) suggests that the Ministry of Higher Education in South Africa should develop a curriculum that promotes the usage of new media

technologies in teaching and learning to produce a technologically advanced generation. One can concur that if rural-based institutions adopt blended learning, this could help to prepare students to be ready to live and work in the digital world.

Creating conducive conditions for blended learning in rural-based universities necessitates a context-friendly implementation model where institutional evaluation data inform strategies, support and pedagogical approaches, and related resources that can be used locally (Muhuro & Kang'ethe, 2021).

Prioritising education as a public good is crucial to avoiding a generational catastrophe and driving a sustainable recovery. To be more resilient, equitable and inclusive, education systems must transform, leveraging technology to benefit all students and building on the innovations and partnerships catalysed throughout this crisis (UNESCO, 2021).

The study conducted by Mhlanga (2021) recommends that for blended learning to be successful, it is important to ensure that there is a policy platform for addressing challenges related to inequality, skills deficit and the massive digital divide. Moreover, the study accentuated that policies that are geared towards addressing all the challenges above should be prioritised if blended learning is to be effective in South Africa.

Also, du Plessis *et al.* (2022) emphasised that research studies should be conducted that review institutional documentation to identify how institutions made sense of the Covid-19 pandemic. Of utmost importance, the above-mentioned authors emphasised that blended learning requires more than technology and software tools. It demands collaboration, care, preparation, expertise, resources, and learning lessons. Furthermore, it was indicated that higher education institutions' agility to effectively adapt to change is contingent on change management skills, preparedness for crises, sensitivity and willingness to collaborate, offer care and support to staff and students, and lastly, an innovative yet cautious attitude towards employing new and untested educational technology.

ADOPTED METHODOLOGY

This study adopted a non-empirical research design: a systematic review. According to Siddaway, Wood, and Hedges (2019), the systematic review involves a comprehensive and systematic search to locate all relevant published work that addresses one or more research questions, and a systematic presentation and integration of the characteristics and findings of the results of that search.

Given that Covid-19 has resulted in the adoption of blended learning, this paper qualitatively explores experiences and challenges of blended learning by rural-based institutions of higher learning in South Africa amid Covid-19 and establishes solutions to blended learning challenges faced by the institutions. The qualitative research approach, according to Kumar (2011), helps to describe the variation and diversity in a phenomenon, situation, or attitude with a flexible approach to identify as much variation and diversity as possible.

As indicated in the abstract, the study's articles were obtained from the computer-based scientific search engines Google Scholar, EbscoHost, ResearchGate, ScienceDirect, and Scopus. All of the articles in this study were evaluated based on the inclusion criteria and relevance.

Therefore, purposive sampling was used to select relevant articles rather than using any articles that had no bearing on the study. According to Leavy (2017), purposive (judgment) sampling is based on the premise that seeking out the best cases for the study produces the best data, and

research results are a direct result of the cases sampled. Purposive sampling, according to Silverman (2000), allows the researcher to select a case because it illustrates an interesting feature or process.

In this regard Etikan, Musa, and Alkassim (2016) are of concern that purposive sampling is typically used in qualitative research to identify and select the information-rich cases for the most proper utilisation of available resources.

Purposive sampling was used to select articles for inclusion in this study, which used the following criteria:

- Articles on the adoption of blended learning by rural-based institutions of higher learning in South Africa amid Covid-19;
- Global studies that reported on the adoption of blended learning by other institutions of higher learning;
- Primary studies that showed originality in the field of research; and
- Studies conducted between 2000 and 2022 mainly.

The process of selecting articles for inclusion in this study is depicted in Figure 1 below. The initial search yielded 41 records in this study, with an additional 10 records (books) and other unpublished literature consulted, for a total of 51 records. Ten records were removed from this total, either due to information duplication or because they did not meet the inclusion criteria. The remaining records totalled 41, of which 31 were further screened. As a result of the screening, 1 record was excluded because it contained irrelevant information, leaving 30 records. The eligibility of the remaining 30 records was then determined. In addition, five articles were removed because they contained information about other countries. Finally, only 19 articles and 6 books were used for the purpose of this study, for a total of 25.

The researchers used the five steps below to assess the studies that would be included in this systematic review:

- Framing the question for review;
- Identifying relevant work;
- Assessing the quality of the studies;
- Summarising the evidence;
- Interpreting the findings.

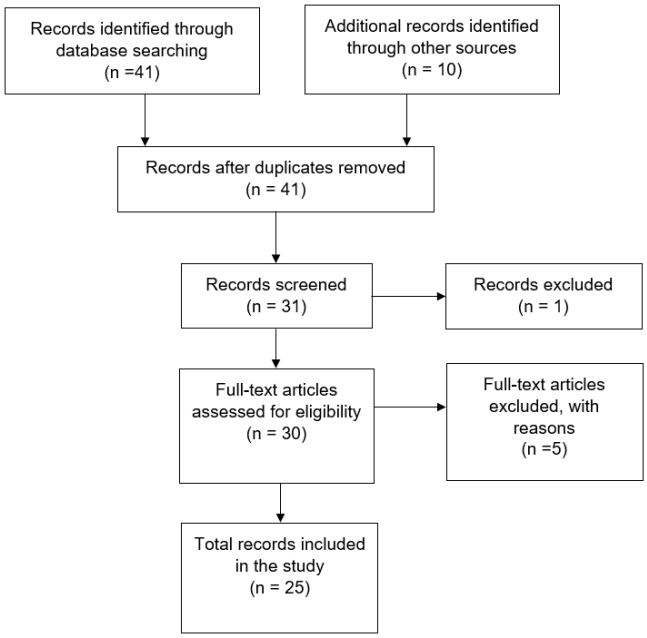

Figure 1: The process followed in identifying articles relevant to this study (PRISMA)

The researchers used the thematic analysis method to analyse data from the repository about the adoption of blended learning by rural-based institutions of higher learning in South Africa amid covid-19. The researchers used thematic analysis because they wanted to deal with patterns that allow for a more understandable thick analysis. In this regard, Ibrahim (2012) explained that thematic analysis is a type of qualitative analysis that is used to analyse classifications and present themes (patterns) that relate to the data.

The researchers used thematic analysis to organise data into different themes and sub-themes that emerged in a narrative revised form. All themes developed during the inception of this study and researchers were guided by the study's research questions.

RESULTS AND DISCUSSION

Importance of blended learning in institutions of higher learning

The findings focus on the importance of blended learning in institutions of higher learning in South Africa.

Online learning resources

According to the findings of this study, articles consulted revealed that blended learning provides learning resources such as online articles, pre-recorded videos, and YouTube links before the class takes place. As guided by the presented reviewed literature of this study, this was also emphasised by Olawale and Mutongoza (2021).

Opportunities for flexible learning

During the research, it was revealed that prospects of blended learning entail providing opportunities for flexible learning. In this regard, Muhuro and Kang'ethe (2021) believe that this enables access to a wide range of educational resources and limits alienation associated with purely online education delivery.

Competitive edge

It was revealed in this study that blended learning helps to maintain a competitive edge and classes more accessible to a growing and diverse student population. This was highly emphasised in the study conducted by Perumal *et al.* (2021).

Different learning experiences

The study discovered that this kind of learning pedagogy promotes different learning experiences for both students and lecturers. Further, the study conducted by Mhlanga (2021) found that this could be possible by mixing learning environments such as lectures, self-paced study, and online collaboration, among others.

Personalising pace

Most sources consulted in this study revealed that students benefit from blended learning as they can learn the materials at their own pace and can use other technological tools. In line with this, Muhuro and Kang'ethe (2021) indicated that technological tools can be used for further research to access important learning content that improves the student experience.

Blended learning challenges faced by rural-based institutions of higher learning amid Covid-19

This discovery sheds light on the blended learning challenges faced by rural-based institutions of higher learning amid Covid-19.

Most expensive internet connection

The study revealed that internet connection is very expensive and, in some

cases, very limited. From the articles consulted, Dube (2020) clearly emphasised that the lack of internet dismally affects the adoption of blended learning by rural-based institutions of higher learning amid Covid-19.

Inequalities at higher education institutions

According to the findings of this study, inequalities at higher education institutions demonstrate that South Africa may not be prepared for blended learning amid 4IR. In this regard, the study conducted by du Plessis *et al.* (2022) found that some higher education institutions are ready to move to a new kind of teaching and continue with the academic term, whereas others faced severe constraints related to students' poor access to technology.

High rises in students' academic dishonesty

It was revealed in this study that during the adoption of blended learning, most institutions of higher learning have witnessed high rises in students' academic dishonesty, and in most cases, they simply do not have effective mechanisms to combat this illicit behaviour. This was emphasised in the study conducted by Olawale and Mutongoza (2021). Further, the study revealed that most institutions do not have measures that regulate academic integrity online.

Accustomed to traditional teaching

The study discovered that another challenge to blended learning is accustomed to traditional teaching by rural-based institutions of higher learning amid Covid-19. According to Lassoued *et al.* (2020), the reason is that most institutions favoured traditional teaching for many years without thinking about the new method of teaching i.e. blended learning.

Struggle to upskill academic staff and students

According to the findings of this study, some institutions are much less prepared for the new kind of learning, and they also struggle to upskill academic staff and students to be familiar with new technologies. This was strongly emphasised in the study conducted by Plessis *et al.* (2022).

Lack of data, Wi-Fi, and access to digital devices

Most consulted sources revealed that lack of data, Wi-Fi, and access to digital devices negatively affect the new kind of learning. As a result, Muhuro and Kang'ethe (2021) revealed that many institutions have constraints related to unstable or non-existent network coverage characteristics in rural locations, and this affects morale for the wider implementation of blended learning.

Weak goodwill and limited policy guidelines

The study revealed that weak goodwill and limited policy guidelines affect the smooth implementation of blended learning. This was also emphasised in the study conducted by Muhuro and Kang'ethe (2021).

Plausible solutions to blended learning challenges faced by rural-based institutions of higher learning

This finding suggests plausible solutions to blended learning challenges faced by rural-based institutions of higher learning.

Full access to data

The study revealed that rural lecturers and students should have access to data. This, according to the findings of the study conducted by Dube (2020) could help

both lecturers and students to engage in the blended learning process.

Taking advantage of technological development

According to the findings of the study, institutions of higher learning need to take advantage of developments in technology to provide successful blended learning. This was highly emphasised in the study conducted by Lassoued *et al.* (2020).

Provision of Wi-Fi, digital devices and data

The study discovered that the South African government should provide Wi-Fi, digital devices, and data to students and lecturers, especially from rural-based institutions. Thus, the study conducted by Olawale and Mutongoza (2021) also discovered that to promote technology-enabled learning for students, the government should bridge the digital divide that exists both in the community and in the education system.

Integrating media and technology into the curriculum

According to the findings of this study, to effectively adopt blended learning, the Ministry of Higher Education in South Africa should develop a curriculum that promotes the usage of new media technologies in teaching and learning. This was also indicated in the paper presented at the 12th Annual AISA International Interdisciplinary Conference by Sundani and Mangaka (2021).

Implementation of policy

Most consulted sources such as du Plessis *et al.* (2022) revealed that is of crucial importance to ensure that there is a policy platform for addressing challenges related to inequality, skills deficit, and the massive digital divide and that research studies should be conducted that review institutional documentation to identify how institutions made sense of the blended learning amid the Covid-19 pandemic.

Care and support to staff and students

The study revealed that institutions of higher learning should offer care and support to staff and students towards employing new educational technology for teaching and learning. This was also indicated in the study conducted by du Plessis *et al.* (2022).

Limitations of the study and future research directions

This study has been limited to recent information on experiences and challenges of blended learning by rural-based institutions of higher learning in South Africa amid Covid-19. Therefore, more studies should be conducted in this area to bring more solutions to challenges affecting the adoption of blended learning to enhance and improve effective teaching and learning amid and post-Covid-19 in South Africa.

CONCLUSION

In conclusion, as indicated in the findings, blended learning develops understanding through discussions among students and lecturers and promotes flexible learning and enables access to a wide range of educational resources. On the other hand, this study acknowledged that students in rural areas were excluded from teaching and learning due to challenges related to resource constraints such as lack of internet access, provision of Wi-Fi, and technological devices that could effectively assist them to pursue their studies amid Covid-19.

Therefore, to mitigate blended learning challenges experienced by rural-based institutions of higher learning, it was strongly emphasised that Wi-Fi, data, access to technological devices, and

implementation of policies that are in line with the curriculum, among others, are necessary to complete the transition to this kind of new learning in South Africa.

RECOMMENDATIONS OF THE STUDY

This study highlights the experiences and challenges of blended learning by rural-based institutions of higher learning in South Africa amid Covid-19, and the adoption of blended learning to improve teaching and learning amid Covid-19.

Following the above results and discussions, therefore, the study came forth with the following recommendations:

- Since most universities adopted blended learning, the Ministry of Higher Education should provide students and lecturers with modern devices (tablets and laptops) and unlimited data to ensure accessibility to blended learning in rural-based institutions of higher learning.
- Rural-based institutions of higher learning need to continuously seek ways to enhance blended learning even beyond Covid-19, i.e. workshops and training for students and lecturers to flex their digital skills. For example, lecturers need to have basic computing skills, electronic presentation skills, internet navigation skills, and networking and collaboration skills, among others.
- Rural-based institutions and lecturers need to liaise with other institutions that have already implemented blended learning to benchmark how they have adopted blended learning and its effectiveness in modern education since blended learning is the way forward.
- Education researchers and policymakers should conduct research on blended learning and implement policies that could advance the pedagogical skills of students and lecturers in rural-based institutions of higher learning.
- Government and education leaders in South Africa should swiftly and decisively design a blended learning plan aimed at supporting rural-based institutions of higher learning aimed at recovering learning losses experienced due to the outbreak of Covid-19.
- There is a need for efforts and commitment in the field of integrating technology within rural-based institutions of higher learning to develop and adopt blended learning following the adoption of this teaching method.

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Humanizing Teaching Pedagogy: An Evaluation of Disciplinary Literacy in Higher Education

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ABSTRACT

Studies have suggested that there is a discerning literacy challenge in South Africa. The literacy crisis in South Africa is not unique to higher education institutions. The current study focuses on humanising teaching pedagogy at institutions of higher education. In this study, more focus is placed on the evaluation of disciplinary literacy in higher education. This is a mixed method research premised on an interpretivist paradigm. The study uses secondary data from one of the authors' Phd study conducted in one institution of higher learning in South Africa. Data was collected through questionnaires and interviews. The study purposely selected second- and third-year students enrolled in Sesotho module, either as a major or as an elective in one university in South Africa. Ethical clearance was obtained from the university where data was collected. Findings of the study point to students believing that the incorporation of their primary languages can have benefits towards their education. Students also indicated that most of them struggle to participate fully in lectures due to their limitations in English command. Our recommendation is that diverse repertoires must be viewed as resources upon which students can rely on to empower themselves in humanising education provision. The study further recommends that multilingual pedagogies such as translanguaging can be useful to advance the project of teaching and learning in higher education and provide opportunities for self-reflections.

Keywords: decolonization, academic literacy, translanguaging, transformation, home language teaching.

INTRODUCTION

In South Africa literacy challenges are exacerbated by promotion policies within the basic education department, which are not centralised on learners' cognitive development. Studies conducted in South African schools by Pistorious & Lephalala (2011), and Howie et al. (2017) cited in Anker (2020) have concluded that learners in South Africa fail to demonstrate adequate capability of understanding field-specific knowledge of subjects which they are enrolled in. This challenge is not specific to basic education schools alone. It is also prevalent in higher education institutions in the country. Linder et al. (2014) highlight that there is a necessity for transformation in teaching physics due to representational competency challenges encountered within a teaching and learning environment. Within the South African context, government school alumni have emerged from an epistemologically unjust teaching practices where teaching was not offered in their languages in content subjects. For every content subject, they encountered a

different world and they had to function in that world in the assimilated foreign language. Consequently, students fail to effectively function within the required proficiencies of content subject due to unmatched requirements of each subject.

South African schools are plagued with several socio-economic and socio-political challenges that affected the teaching and learning programme, which in turn, affects student's literacy skills. In analysing the challenges that face South African schools, Mouton et al. (2013) indicate that factors that face schooling system include poorly performing teachers, poor ethics, lack of community and parental support and poor support for teachers. Mokala (2017) takes this argument further by indicating that parents are not fully involved in their children's education. Some of the reasons for this lack of parental involvement include illiteracy, children who stay with grandparents as well as lack of recognition of parents in schools (Mokala, 2017). These factors affect learners' performance and literacy. Lack of parental involvement herein includes behavioural componence that is associated with active monitoring of students' academic progress. The lack of parental involvement in schools is likely to increase factors such as achievement gap, inequality and discriminating experiences in a quest for education (Mokala, 2017). It is also quite difficult to determine unambiguously what parental involvement entails for young adults entering university due to knowledge gaps that might exist between students and their parents. Furthermore, this support might be hindered by competency challenges, as learners are required to use English at a high level of competency (Thobejane, 2018). In South African universities, students are expected to meet linguistic requirements of content courses despite their immersion of an education system where they needed to acquire English as an additional language. This linguistic pedagogic hegemony is further encouraged by entrenched ideologies of world citizenship, globalisation and upward mobility since English is regarded as a language that has economic value in South Africa.

Linguistic practices in higher education are yet to be transformative in South Africa. The teaching and learning environments have diversified such that lecturers ought to develop appropriate advocacy and compensatory skills to effectively facilitate successful teaching and learning. Despite this notable change in education, the teaching practice continues to observe monolithic language pedagogies which alienate students who have limited linguistic competency and performance in the language of teaching and learning (Makalela, 2015, Charamba & Zano, 2019; Childs, 2016). Institutions of higher education in South Africa upheld an exoglossic type of teaching methodology post-apartheid, particularly in the teaching of content subjects. Within the context of South Africa, many black students are taught English either as a second or third language. Students' true potential is sometimes hindered by their limited proficiency in English. Moreover, content subjects due to field specific terminology impose an additional challenge to students who are required to alternate between variants of English. This status quo remains the same because teacher-preparation programs in universities have yet to identify the value of pluralistic teaching methodologies. Notwithstanding this, Makalela (2015) asserts that learners in classrooms resist monolingual policy prescriptions in favour of a more inclusive teaching and learning approach. Monolithic teaching pedagogies may undervalue students' socio-emotional difficulties under the assumption that due to English hegemony, students must strive to acquire

mastery of the language despite experiencing the language at an additive level.

Language is an integral part in facilitating successful acquisition of knowledge, therefore, in a teaching and learning circumstance, participants ought to find innovative ways to maximize the learning experience for students. It is important for students and lecturers to share a common experience to understand one other, since context is essential for making sense of the information shared between students and lecturers. Deep understanding of literary challenges demands that lecturers must possess adequate knowledge of language situation in South Africa. When lecturers possess adequate knowledge about linguistic practices within the education sector, they may be able to facilitate strategies to scaffold the 'below' students' source. Institutions of higher education in South Africa, through their language policies, use English as the language of instruction across a few disciplines. Most students enter universities with a wide range of English language proficiencies based on their school experiences. In higher education, students are instructed and assessed in English. At times, the linguistic competency that is required at university is unmatched with government schools' alumni. Against this background, this study focuses on the description of linguistic practices that can be used to facilitate cohesion and unity in a classroom situation.

The primary objective of teaching is to impart knowledge to students. Language should not be an impediment to successful acquisition of knowledge, and or knowledge transfer between lecturers and students. Language is an important tool that facilitates the project of teaching and learning. To date, linguistic diversity in lecture halls or lecture rooms have not been embraced. This affects students' interaction with the curriculum, thereby alienating students with limited command of English. Consequently, optimal learning is negatively affected. This contention is emphasised by Suryanto's (2018) observation that optimal learning is hampered when relationships (between students and lecturers, and students and other students) are disconnected due to the state of students' alienation in the teaching and learning process. In Suryanto (2018) four aspects that manifest students' alienation include powerlessness, meaninglessness, isolation, and self-estrangement. Individually, these aspects are discussed to situate them within the context of this study. To place these aspects within the context of the current study, it is imperative to discuss them individually and marry them to the context of higher education in South Africa.

Within a learning context, students make decisions about how well they can engage subject matters in classrooms. In the case of experiencing impediments to learning, students signal their challenges to lecturers. When lecturers are ineffective towards providing workable solutions to students' problems, students get devastated. Suryanto (2018) indicates that students are powerless when they protest to the teacher, yet their protest is ignored. Ignoring students' 'protest' is a recipe for anxiety. Students that experience limited command of English in lectures are aware of their limitation, therefore, when their pleas are ignored, they cave in. Thus, as Kajee (2021, p. 138-139) puts it "the importance of teachers creating opportunities for students to be involved in learning through problematizing knowledge and contributing to a better world cannot be sufficiently emphasised." Therefore, to minimise this feeling of being powerless, lecturers need to help students to solve problems by humanising teaching pedagogy among others.

It is not unusual that students who seem to have limited competence of the language of teaching and learning may struggle to make sense of academic activities and their requirements in class. Lecturers that are not prepared to deal with diverse linguistic competencies may also be frustrated by students that struggle in this regard. Situations like this might render the teaching and learning process meaningless, thereby collapsing the learning process. Due to language barriers, students may struggle to communicate or express themselves adequately to make sense of the material discussed in class. When students lack cultural equivalents of the concepts expressed in their lectures, they may fail to make sense of the material discussed in class for their individual benefit. Therefore, communication barriers dictate the quantity of information that students who appear to have linguistic limitations enjoy in lectures. It is imperative for lecturers to have a sense of accountability by making use of teaching methodologies that address the diverse nature of student population. Mokala (2022, p. 29) postulates that "The South African education system is underpinned by the need to address the inequalities of the past". Language inequalities also play a role in disempowering the 'below' students, therefore, acknowledging the linguistic diversity is the first step to addressing the linguistic needs of the students. "The promotion of indigenous languages as official languages was meant to recognise and celebrate the diversity of cultures in South Africa. Non-indigenous languages were the only languages used in respected avenues of society" (Khetoa, 2019, p. 1). However, to date research indicates that in South Africa, institutions of higher education were mandated to develop language policies that are multilingual in nature, with the aim to advance equity and access in higher education (Madiba, 2010; Mokala et al., 2022). However, there is a need for language policies that are multilingual in nature to be implemented in institutions of higher learning for diverse students to benefit from teaching and learning and not find their learning to be meaningless.

Translanguaging is essential in such situations. Translanguaging is normally associated with education circumstances where more than one language is used. Translanguaging "…opens and expands opportunities for engagement in meaningful language and literary practices, thus ensuring more equitable earning environments." (Parra & Proctor, 2022, p.2). In other words, translanguaging in classrooms appears to be of essence since it provides students the opportunity to understand what is being taught in the class using their primary languages.

Makoni (2017) postulates that "by focusing on the quality of their notetaking in and out of class, researchers from the University of the Witwatersrand or Wits, South Africa, have established that poor English language competence is hindering the academic performance of a significant number of undergraduate students for whom the language is not their mother tongue". In advocating for a decolonised curriculum, Dukhan cited by Makoni (2017) indicates that the issue of language barriers should be at the centre of debates about an inclusive curriculum given that many students face language barriers when they move into universities. In higher education, students are expected to comprehend varying texts that they are exposed so that they can analyse, critique, evaluate and synthesize information from various sources Bharuthram (2012). According to Bharuthram (2012) many students entering higher education are not adequately prepared to meet these challenges that include linguistic challenges. Without significant interventions monolithic practices

isolate the students that Makoni (2017) is referring to in his statement. This may also lead to students finding what they are learning to be meaningless to them and that could end up pushing them to end up feeling self-estrangement. Premised on this background, the current study embarks on humanising teaching pedagogy at institutions of higher education. More focus is placed on the evaluation of disciplinary literacy in higher education.

Multilingualism in higher education

South African languages are frequently in contact with each other, thereby leading to multilingual citizenry. In Banta's (2018) view, "at a time when in Africa people necessarily speak at least two languages (an African language and a colonial language) as a necessity; arguments for a singular 'mother tongue' education are out of place". Hlatshwayo and Siziba (2013) opine that tertiary institutions in South Africa have been reluctant to implement multilingual education due to the fallacy that English is the only language that can be used adequately for skills development and training. This has also been exacerbated by higher education aspirations of competitiveness in the global stage. Within the current study then, the researchers explore the evaluation of humanising teaching pedagogy at institutions of higher education.

Humanizing teaching pedagogy and multilingualism

Tapping into students' complete language repertoires as resources for learning – is a humanising act that can change the narrative about multilingual learners and counter dehumanising language policies (Huckle, 2022). Multilingualism inspires new ways of doing things in support of students in a learning environment. This new way of students' support may elucidate a more humane approach to teaching and learning. High linguistic performance that is required of government schools' alumni may alienate students with limited command in the language of teaching and learning. Humanising pedagogy intentionally plans and enacts pedagogical practices that are aligned with students' experiences and perspectives, validate and honour their culture, home languages, and lived experiences with the larger goal of advancing equity and social justice through day-to-day classroom interactions (Fredricks, 2020). Students come to university with all their treasure that includes their primary languages. Expecting students to abandon their treasure is an agonizing experience. To alleviate students' agony, pedagogical approaches such as translanguaging can make a meaningful contribution towards the education of multilingual students. Kajee (2021) expounds that a prerequisite for teaching and learning for humanisation is the acknowledgement of our situated selves. In this view, students' education in South Africa must be informed by commonly observed linguistic realities.

Humanising students' learning experiences is important in the South African context, especially when we consider the country's history and diversity. Countries such as South Africa, whose tragic past created massive social divide ought to rely on humanising approaches. Kajee (2019) alludes that the linguistically and culturally diverse nature of South Africa, it is inevitable that teaching and learning from a social justice perspective be prioritized to address injustices and inequities. This view is supported Zinn & Rodgers' (2012) sentiments that South Africa's legacy of disempowerment and dehumanisation in education needs repair.

Review of literacy studies in South Africa

Studies conducted in South African schools (Pistorious & Lephalala, 2011; Howie et al, 2017 cited in Anker, 2020) concluded that learners in South Africa fail to demonstrate adequate capability of understanding field-specific knowledge of subjects which they are enrolled in. This challenge is not specific to basic education schools alone. Bharuthram (2012) alludes that a common problem that South African higher education institutions are currently experiencing is that many students enter higher education unable to read and write at the level expected of them. Bharuthram (2012) further indicates that in recent years, many articles have reported on poor literary levels of students who are about to enter tertiary education. This status quo is exacerbated by promotion policies in the basic education. In what follows, we explain the theoretical framework guiding the study.

Theoretical framework

Dual theoretical lenses: systemic-functional linguistics and translanguaging underpin this study. This dual process enhances the image that researchers are painting about monolithic pedagogies. The researchers in this study propose that Systemic Functional Linguistics (otherwise SFL) offers higher education institutions an applicative method to mitigate students' self-estrangement or lecturers' isolation within a teaching and learning environment. SFL's focal point is on creating meaningful discourse, not simply viewing language and language learning and teaching in isolated areas such as content or organization. In Fontaine's (2013) view, anyone who has tried to communicate with someone in an unfamiliar language or with a two-year old will know that being grammatically correct is almost irrelevant. In a communicative circumstance in education, there are aspects that might impede students' literary in varying disciplines. Endarto (2017) expounds that within the scope of SFL, there are three contextual variables that meaning making is dependent on; field (the topic being talked about), tenor (the relationship of participants) and mode (the channel of communication). Therefore, failure to facilitate meaning making impedes adequate learning. We find this framework worth underpinning the study as our conviction is that teaching pedagogies must address students' needs in such a way that they respect their life experiences and "maintain their cultural roots" (del Carmen Salazar, 2013, p.121)

To mitigate the situation of exclusive teaching pedagogies where education is isolated from students' native language and culture, translanguaging can be looked upon as an assertive strategy to facilitate learning. Translanguaging is normally associated with education circumstances where more than one language is used to address students' diverse linguistic need and is used as a vehicle for epistemic access (Makalela, 2015). According to Parra and Proctor (2022, p. 1) "translanguaging pedagogy opens and expands opportunities for engagement in meaningful language and literacy practices, thus ensuring more equitable earning environments". Translanguaging is also considered a "pedagogy or a teaching strategy and is utilised as the overarching term for a modern, multilingual theoretical concept befitting teaching and learning in an increasingly global society of today" (Conteh, 2018). Presently, the country is struggling to provide an effective and equitable education for students, with many debates and a wide variety of practices related to policies, programs, and language(s) of instruction (Charamba & Zano, 2019). Despite this, Banda (2018) indicates that within a multilingual classroom setting, learners use their multilingual repertoire to achieve power, agency, and voice. Within

this purposive linguistic practice, learners, and teachers can use their extended linguistic repertoires as normal classroom practice free of retribution, Banda (2018). Students' reliance on their extended repertoires therefore maximises their opportunity to learn and accelerates their participation in lecture theatres. Translanguaging therefore informs this study on the teaching pedagogies that are humanistic and humane as they are critical for the academic and social resiliency of students (del Carmen Salazar, 2013). The section that follows discusses the research problem.

Research problem

Language is an attribute that binds humans together especially in an academic endeavour such as undertaking an undergraduate course. Within a learning discourse, language can inspire an individual to learn or sink a student to despair. Language is important in education primarily because it is a tool to imparting discipline specific knowledge to students. Nath (2010) clarifies that language helps in the formation of concepts, analysis of complex ideas, and to focus attention on ideas which could otherwise be difficult to comprehend. Within the scheme of language learning, we rely on Richard Skemp's view on language. Skemp as cited in Nath (2010) points out that language is a necessary condition for understanding and that language is also a pre-requisite for thought. This connotes that students rely on their primary languages to inform meaning in a learning environment and that this reliance on their primary languages is necessary for processing learned information. Failure to recognise student's diversity within in a learning environment can bring challenges that are unavoidable.

Latest research suggests that there are benefits in relying on multilanguage pedagogies in education (Charamba, 2020; 2022; Mokala et al, 2022). According to Mokala et al (2022), monolingual teaching practices are continually observed in South Africa despite the multiplicity of languages in a classroom. Mokala et al. (2022) recommended that teachers should consider the use of multilingual pedagogic teaching practices to address language diversity in their home language classrooms. Increased mobility after the collapse of apartheid has increased the likelihood of finding many languages within one classroom. On the other hand, colonial policies in South Africa made it possible that many African languages speakers have assimilated at least one language of the colonisers under colonial rule. On this background, there is a heavy presence of other repertoires in university classrooms or lecture halls, even though only a few have been used as mediums of instruction. Most scientific text are readily available in English and this influences lecturers' choice of remaining with English in their teaching sessions and not using any of the African languages in their sessions, probably due to lack or limited competency in these languages. However, the presence of primary speakers in their sessions encourages that these languages must somehow make inroads into the teaching project.

Ngcobo et al. (2016) posit, "Literacy challenges among the majority of African language speaking students learning through the medium of English impact on unequal throughput in South African higher education". Ngcobo et al. (2016) further argue that this situation can be remedied by revising the curriculum in such a way that classroom activities and assessments give recognition to students' African languages. Against this background, the current study investigates evaluation of humanising teaching pedagogy at institutions of higher education. The aim of the study is explained in the following section.

Research aim

The main aim that guides this study is evaluating disciplinary literacy in institutions of higher education.

RESEARCH METHODOLOGY

Research methods represent the tools of the trade, and they provide the researcher with ways to elicit, organize and analyse information so that the researcher can come to certain conclusions and come to some generalisations about patterns observed in the reasoning contained in data collection tools (Walliman, 2011). In this study, the researchers reviewed Khetoa's (2019) doctoral dissertation data, which was presented to the University of the Free State. The researchers used this data because it asked questions that are valuable for this research undertaking. Khetoa (2019) elicited his data through a multipronged research approach. This scholar relied on methodological triangulation in that he collected data by employing mixed method research methodology. In mixed method approach qualitative and quantitative elements are combined, and this combination is characterized by – qualitative – soft, flexible, subjective, political, speculative, case study – quantitative – hard, structured, objective, non-evaluative, surveys, hypothesis-testing and abstract (Dźwigoł & Dźwigoł-Barosz 2020). There are researchers that believe that within qualitative research, the researcher can influence the respondent's responses, while other are convinced that quantitative research provides statistical representation of the problem without providing details about why the problem prevails. Therefore, the use of mixed method in this study seeks to maximize the correctness of the researchers' account about the research question. This approach is fit for this inquiry based on the following reasons:

- For verification
- To provide basis for early detection possible errors which may emanate.
- To facilitate the monitoring of collected data.
- To probe the data set to determine its meaning.

This type of an approach minimizes bias. According to Khetoa (2019) "this particular study stands resolute of providing findings that are unquestionable in character and ascertaining unambiguous results. Choosing to employ mixed methods may prove as a necessary step to minimize errors and ambiguity while increasing validation and honesty".

Data collection

In Khetoa's (2019) study, data was collected using interviews and questionnaires. For the current study, the focus is to select the data that handles aspects that are fit for our focus. The sample in Khetoa's (2019) study comprised students who studied Sesotho at the mother tongue stream and the non-mother tongue stream. The study purposely sampled second and third year students on the assumption that this cohort of students would provide meaningful and informed responses. Fundamentally, the criteria for participation in the study was that students needed to be enrolled for Sesotho modules. Khetoa's sample comprised mainly of speakers of African languages. The study sought to engage about forty students. Only thirty-three students availed themselves to Khetoa's enquiry. Of the number, twenty-two identified themselves as females while eleven were males. Forty-five percent of the sample were in their second year of study and fifty-five percent were in the third year of study. The students were registered for the following bachelors programmes: Education, Language Practice, Divinity, Drama and Theatre, and Art History. This sample was

not drawn from all faculties. It represented the faculty of education and the faculty of humanities. Therefore, the conclusions of this study cannot be generalised.

Research paradigm

The current study employs an interpretivist epistemology for its data. Qualitative research is often associated with interpretivism (Goldkuhl, 2012). Interpretivism epistemology is subjective and is based on real world phenomena. Non-English-speaking students in higher education in South Africa experience authentic literacy challenges with linguistic competencies required in each of their chosen disciplines. Interpretive approach in this study assisted researchers to produce rich insights and trustworthy account of students' challenges which require pedagogical interventions. Within the interpretivist paradigm, the researcher is part of what is being observed and engages with the research (Cornelius, 2017). This paradigm is relevant to this research as it assisted researchers to examine black students' experiences in monolithic teaching pedagogies. As Sefotho (2013, p. 21) postulates " research, paradigms play the critical role of guiding the research process and protocols to be used by those who choose to follow a particular research paradigm route." Therefore, the choice of an interpretivist paradigm in this study was guided by the research strategies as well as the aim of the study.

Data presentation

The superordinate study relied on multipronged methods. Khetoa (2019) used quantitative research tools such as questionnaires to measure the phenomenon that his study was interested in, and relied on interviews for qualitative data. Khetoa (2019) had directly interacted with the participants of his study through interviews and questionnaires. Guided by the aims of the study, we used existing data. Khetoa (2019) had already interpreted his data for the purpose of his study. In this enquiry, we have interpreted his data consistently with the aim of this study, and within the perimeters of the research design that is used in this study. In this section we adopt an interpretivist paradigm to interpret the data on the assumption that students might present a subjective or socially constructed view on how teaching pedagogies affect them or their learning.

Linguistic efficiency

One of the questions asked by Khetoa (2019) sought to establish comparatively which language between Sesotho, English and other languages do students understand better in a learning environment such as university lecture halls. The chart hereunder presents students' responses. It can be deduced from figure 2 below that there is an almost even split between students who have been studying Sesotho for two years and students who have been learning Sesotho for fifteen years. About forty-five percent of students have been learning in Sesotho for more than five years. Thirty-seven percent have been learning in Sesotho for approximately three years or less. In South Africa, students from previously disadvantage transition from learning in their primary language to learning in the lingua franca. Despite this transition, indigenous languages are continually present in English medium classes due to students' limited competency of English. To make sense of the acquired knowledge, students often alternate between varying linguistic codes

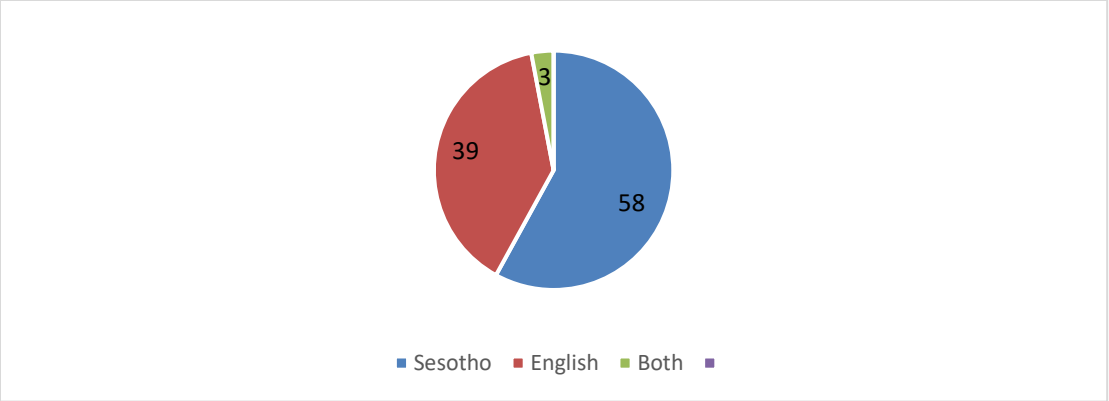

Figure 1: Linguistic efficiency in class

Student's formal training in indigenous language

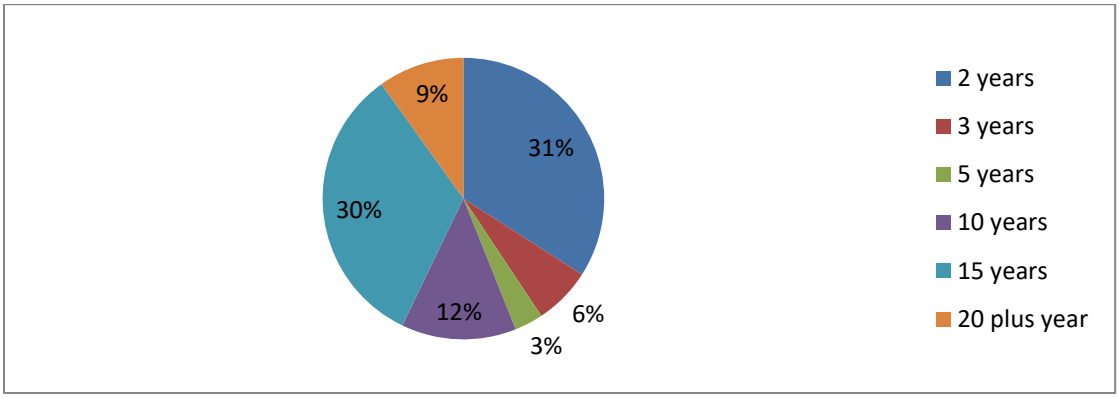

Figure 2: Number of years of formally learning Sesotho

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Language employed by students for effective communication.

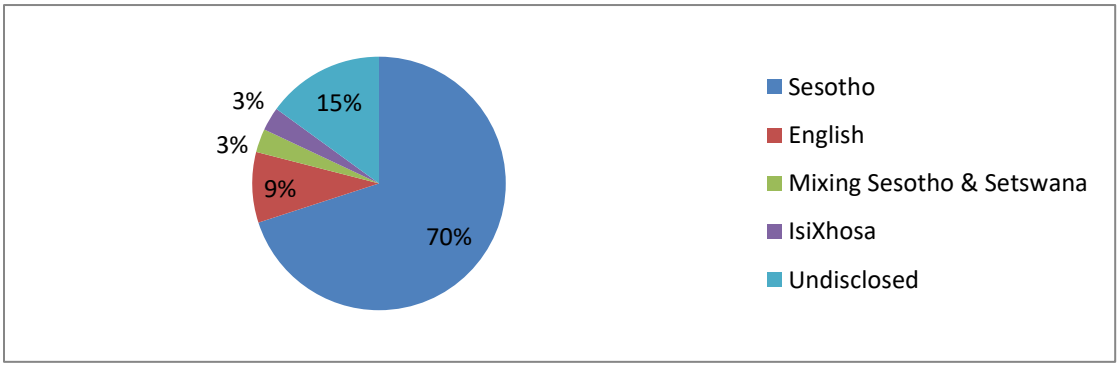

Figure 3: Language employed by students for effective communication.

Figure 1 demonstrates that students' believe that they are optimally efficient in class through the use of Sesotho. This sample comprised of students who are enrolled in Sesotho either as a major or an elective.

It can be deduced from figure 2 hereabove that there is an almost even split between students who have been studying Sesotho for two years and students who have been learning Sesotho for fifteen years. About forty-five percent of students have been learning in Sesotho for more than five years. Thirty-seven percent have been learning in Sesotho for approximately three years or less. In South Africa, students from previously disadvantage transition from learning in their primary language to learning in the lingua franca. Despite this transition, indigenous languages are continually present in English medium class due to students limited competency of English. To make sense of the acquired knowledge, students often alternate between varying linguistic codes.

Students from previously disadvantaged schools in higher education often encounter English language competency barriers largely due to linguistic practices in the schools. Figure 3 illustrates that seventy percent of the sample have strong linguistic competence in Sesotho so much that they can effectively communicate in it. This means that students rely heavily on this language to make sense of their academic experiences.

The second part of Khetoa's (2019) data that the researchers of this study looked at was the interview's data. The data that is presented here addresses the research question of this study.

Would you appreciate being instructed in a different language in class and be able to respond in Sesotho?

The idea of being able to alternate between students' primary language and the language of teaching and learning in higher education is accommodated by students. In students' perspectives they would be able to effectively elaborate their responses and make sense of their learning experience. Students also indicated that most of them struggle to participate to fully participate in lectures due to their limitations with English command.

FINDINGS AND DISCUSSION

In this study, it has been determined that most students experience authentic literacy challenges with linguistic competencies required in each of their chosen disciplines. The results of this study therefore advocate for the use of students' languages in classrooms as they communicate effectively in their primary language. Charamba and Zano (2019, p.) agree that permitting the use of students' languages in the classroom beyond the current state would not only preserve those languages but also the cultural banks and ideology. According to Ngcobo (2016) recognition must be given to students' African languages. To respond to linguistic competency challenges among students, students indicated that teaching pedagogies such as translanguaging, where students can alternate between their primary languages and the language of instruction, can have undeniable benefits. This resonates with Charamba and Zano's (2019) findings which revealed that students' linguistic repertoire should be a linguistic tool that enriches their learning experiences. As such language is used systematically to maximize learning opportunity among students (Makalela, 2015).

CONCLUSION

This study is not had its own challenges. At the core of our challenges in this study is that the sample is not a complete representation of the student population. Therefore, our conclusions cannot be generalized as a true reflection of the entire student population. Linguistic practices in higher education are yet to be transformative in South Africa. In the new dispensation, the

teaching and learning environment have diversified such that educators ought to develop appropriate advocacy and compensatory skills in order to effectively facilitate successful teaching and learning. In this study, researchers contend that language is an important attribute that binds humans together especially in an academic endeavour. Researchers argue that within a learning discourse, language can inspire an individual to learn or sink a student to despair. This study sought to evaluate disciplinary literacy in institutions of higher education. The results indicate that students struggle with linguistic competency and performance of disciplinary literary. Hence, students believe that the incorporation of their primary languages can have benefits towards their education. Language ought to be used systematically to support the teaching and learning experience in institutions of higher education. The incorporation of students' home languages will humanize the teaching and learning experience in that it may mitigate student's alienation, and it will recognize students' dignity.

RECOMMENDATIONS

The diverse nature of students in higher education warrants that the approach to teaching and learning must be revisited. Local languages must be developed meaningfully and be purposefully incorporated in academia to support students who fall short with linguistic competency on English. Moreover, institutions' teaching practices and linguistic practices must be informed by socio-historical perspectives especially zooming into issues of social justice.

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Curriculum Development for Online Teaching and Learning: Academics' Perspectives from A Rural-Based University in South Africa

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ABSTRACT

This study sought to explore academics' perceptions of the development and delivery of curriculum for online teaching and learning in a rural-based university. Technology integration into teaching and learning in higher education is receiving more attention, thanks to the Coronavirus pandemic that has forced all facets of lives to look for alternative methods of operation instead of face-to-face contact. The pandemic saw most institutions of higher learning move their mode of curriculum delivery from face-to-face to multimodal learning using technology. This, however, was done without considering whether the existing curriculum that was accredited to be delivered face-to-face will perfectly fit into multimodal learning. The exploratory research design within the qualitative research methodology was applied in this paper. Purposive and convenience sampling techniques were applied to sample a rural university in Limpopo province of South Africa, and academics respectively. Semi-structured interviews and reflexive thematic analysis were employed for data collection and analysis for this paper. The study revealed there is a relationship between curriculum development and the mode of delivery used for teaching. Some of the academics indicated that a lack of technological skills poses a threat to adopting new technologies for teaching. In light of this, the study recommends ICT infrastructure investment and human resource capacitation for proper integration of technology for teaching and learning.

Keywords: Curriculum, Technology, Higher education, Teaching, and learning

INTRODUCTION

The use of technology in the educational sector comes a long way, and the integration of Information and Communication Technologies (ICTs) in the higher education sector has received much attention recently. Several factors including the technological revolution and the advancement of the Fourth Industrial Revolution (4IR), natural disasters, and the Coronavirus (Covid-19) pandemic amongst others influence the massive move in integrating technology in the higher education sector (Mhlanga & Moloi, 2020). Institutions of higher learning in South Africa, particularly the historically disadvantaged ones are always playing catch-up with the technological advancement in the sector (Du Plessis, et. al., 2022). Most of the previously disadvantaged institutions of higher learning are accredited to provide education through the contact and/or face-to-face mode of teaching and learning. However, the Covid-19 pandemic and the lockdown regulations such as avoiding face-to-face meetings have proven that nothing will remain static, and institutions of higher learning were advised to adopt alternative ways to continue with teaching and learning (Baloyi & Malatji, 2022). Thus, most if not all institutions of higher learning adopted

multimodal learning as a suitable approach to delivering teaching and learning (Ally, Pillay & Govendor, 2022). This approach received great attention from scholars all over the world in trying to integrate technology for teaching and learning as a mitigating factor against the Covid-19 virus. However, there is a realisation that a multimodal approach to teaching and learning will be embraced forever, regardless of the changing situation of the Covid-19 pandemic (Ngoatle, Mothiba & Ngoepe, 2022).

Various Learning Management Systems (LMSs) have been adopted to facilitate teaching and learning in the higher education sector. Some of the LMSs that have been embraced include Blackboard, Moodle, Canvas, Google Classroom, Desire2Learn, and Schoology among others. These LMSs permit academics and students to have virtual lecture sessions without having physical contact. These platforms also provide an unlimited space for virtual teaching and learning, where a much number of students can attend a single class unlike when they have to be confined by the classroom building and limited resources. These platforms also provide a range of other advantages including recording and archiving of lecture sessions for reference and future use (Singh, Steele & Singh, 2021). This move also saw the rapid adoption of other features such as social media platforms for teaching and learning. Social media platforms that were formally known for communication and socialising, such as Facebook, WhatsApp, YouTube, and others started to receive much attention for different use. These platforms are now being utilised to facilitate teaching and learning within the higher education sector (Ansari & Khan, 2020). Academics and students can create a WhatsApp group chat where they can share study materials, record and share lectures, facilitate consultations, and provides platforms for peer learning among students. Institutions of higher learning are now utilising these platforms for teaching and learning (Khan, et al., 2021). Curriculum development would consider the content to be taught in class, the methods and/or approach for teaching and learning, and the assessment methods that would be applied to test the learning among students among other aspects. Accordingly, it is of significance to consider all these aspects when the institution of higher learning migrates from a face-to-face approach to teaching and learning to multimodal learning.

PROBLEM STATEMENT

Multimodal teaching and learning have been rapidly adopted in the higher education sector, due to the Covid-19 pandemic. However, such adoption was implemented without taking into account whether the existing curriculum flawlessly fit into the adopted approach (Muhuro & Kang'ethe, 2021). As much as these technological platforms bring about more advantages regarding teaching and learning, it also exposes other challenges for both academics and students. These challenges include a lack of technological skills in using various technologies for teaching and learning, poor Information Communication Technologies (ITC) infrastructure within institutions of higher learning, and a lack of capacity in transforming the existing curriculum to fit multimodal learning (Najafabadi, Poorsadegh & Mirdamadi, 2013). Various curricula would need different approaches when delivered for teaching and learning. Thus, there is a need to properly capacitate academics to develop a new curriculum that would be perfectly delivered using various technologies including social media. Thus, it was significant to explore academics' perceptions in the development and delivery of curriculum for online teaching and learning in a rural-based university.

LITERATURE REVIEW

The reviewed literature pays attention to the technology integration for teaching and

learning, the curriculum development and the use of technology for teaching and learning, and also opportunities and challenges faced by academics in using technology for teaching and learning.

Technology integration for online teaching and learning in higher education.

Technology integration into education has been existing for ages with the adoption of early ICTs for teaching and learning. These ICTs include the use of audio speakers to maximise the voice of the facilitator, and the use of visual screens, overhead projectors, and computers to enhance teaching and learning. Moreover, technological advancement has witnessed the change that has been brought by digitisation into education. This saw the advent of the concept of online teaching. The notion can be easily understood as the interconnectedness of the teacher and the student through an array of digital platforms (Akcil, Uzunboylu & Kinik, 2021). This also includes access to learning materials through technology; and the facilitation of communication between the teacher and students. Online teaching also suggests that the teacher should be able to assist students using various digital platforms of communication (Malatji, Masuku & Baloyi, 2021). Furthermore, online teaching and learning should be regarded as a formal learning platform like any traditional teaching environment. However, these digital platforms require adequate aptitude, assertiveness, and knowledge of academics to perform in a better way that surpasses the expected standards. The lack of such capacity would be detrimental in integrating new technologies for teaching and learning. Several skills would be needed for curriculum development, delivery, communication, and assessments. Other required skills involve lesson planning, archiving lessons, and study materials among other activities. Thus, the previous literature has paid significant attention to the classifications and characteristics of online teaching abilities. Akram, Yingxiu, Al-Adwan and Alkhalifah (2021) highlight course design using technology as one of the significant skills needed by academics. Designing a course while taking into account the use of technology for teaching and learning makes it easier to deliver such content to students. On the other hand, Hanafi, Said, Wahab and Samsuddin (2017) submit that the attitude and behaviour of academics are important in adopting online technology for teaching and learning. A positive attitude and good behaviour would assist academics to easily acclimatise to the use of digital platforms for teaching. Moreover, Schaffhauser (2022) indicates that academics should possess the required skills to develop a curriculum suitable for online teaching and learning.

Curriculum development and use of online technology for teaching and learning

Literature has highlighted the significance of integrating online technology in curriculum development and pedagogical practices. Atabek (2020) indicates that it is important to integrate technology for teaching and learning while taking into cognisance the curriculum and the teaching practice to be used within such technologies. The literature also indicates that using online technologies to teach assists academics to be competent in teaching practice as well as the curriculum they teach in their virtual classroom. Moreover, the digital skills of academics empower them to easily familiarise themselves with different teaching approaches, which ultimately enhance their performance when delivering curriculum (Oliva-Córdova, Garcia-Cabot & Amado-Salvatierra, 2021). This also assists students to learn fluently, however, this will depend on the suitability of the developed curriculum and the teaching approach applied when using technology for teaching. Ifinedo,

Rikala and Hamalainen (2020) highlight that academic digital competence plays a crucial role in integrating technology for online teaching and learning, while the aptness of the teaching approach and the inclusion of professionals in developing appropriate curriculum would go a long way in enhancing online teaching and learning. The literature highlighted a need to train academics in developing a suitable curriculum that will perfectly fit online teaching and learning. Experts in curriculum development play a critical role in capacitating academics and curriculum developers in this regard. The curriculum that was meant for traditional face-to-face teaching and learning needs to be reviewed and transformed for online teaching and learning. Alanazy and Alrusaiyes (2021) are of the view that online technology cannot be properly integrated into teaching and learning unless academics possess the three basic critical digital skills which are namely, technological, curriculum, and pedagogical.

Opportunities and challenges in curriculum design for online teaching and learning

The technological revolution has brought about a change in many facets of lives and societies, and it has put some pressure on curriculum design, teaching and learning. The internet has transformed and reshaped the nature of education, and it is viewed as one of the significant elements of curriculum support, irrespective of whether the curriculum is viewed as content or a pedagogical process (Castaneda & Williamson (2021). Furthermore, online technology has transformed the way curriculum has been developed and delivered in the teaching and learning process (Pangrazio, 2021). Technological advancement has brought the possibility of various forms of teaching and learning and enhanced the improvement of processes and the change in the curriculum design; teaching and learning process (Viana & Peralta, 2021). Critical elements such as the internet of things, artificial intelligence, and big data among others have seen a change in most of the curriculum and its way of delivery (Abichandani, Sivakumar, Lobo, Iaboni & Shekar, 2022). The change of curriculum in most of the subjects has taken into consideration technological advancement as a way of delivery.

Another angle of curriculum design that needs a critical evaluation is the efficiency of students' collaboration and interactivity through digital platforms. It has been proven by the previous literature that digital platforms have enhanced the way students communicate amongst themselves and with academics. Topal (2016) submits that communication among students is an essential element of learning in any given teaching approach. Communication using digital platforms amongst students includes social media, emails, and texts through group discussion boards while learning management systems facilitate communication between students and academics (Gloria & Uttal, 2020). On one hand, developing design for students living with disabilities is a critical area that still needs special attention. This will establish whether online teaching and learning is appropriate for the needs of students living with disabilities. A part of the literature indicates that online technologies present challenges for students living with disabilities (May, 2020). On the other hand, literature also indicates that students living with disabilities take advantage of using different online learning opportunities, including communication, easy access to study materials, and collaboration with fellow students among other activities (Hunter & Ross, 2019).

THEORETICAL FRAMEWORK

The theoretical framework is one of the fundamental elements of scientific investigation, and it is essential in knowledge

production. The theory is used as a lens that boosts a particular argument. Accordingly, the Connectivism learning theory has been employed as a lens for this study. Connectivism explained as a learning theory for a digital age was discovered by George Siemens in 2004 (Siemens, 2004). The main aim of this theory is to lead a way for an appropriate new model of learning, which is suitable for society, where "learning is a process of connecting specialised nodes or information sources" (Siemens, 2004). The theory maintains that the principle of connectivism should take a center stage in the teaching and learning process since the internet has brought about a huge change in comprehension of knowledge. The concept of 'connectivism' was coined to explain learning networks, and according to Bates (2015), knowledge is created away from the level of an individual. Knowledge in the networks is not created and/or managed by an individual or any formal organisation, but people can always log in to this world of continuous information flow to make meaning from it. Some of the assumptions of Connectivism learning theory state that learning and knowledge rest in diversity of opinions; learning is a process of connecting specialised nodes of information sources; learning may reside in non-human appliances; and the capacity to know more is more critical than what is currently known amongst other principles (Siemens, 2004). Thus, this study is aligned with the Connectivism learning theory to elucidate the important aspects of the discussion. The theory emphasises the importance of using technology to connect and access an array of information for teaching and learning.

Furthermore, this theory is relevant for this study since it highlights the significance of taking an advantage of the ever-changing technology for teaching and learning. Thus, it is of importance that academics together with students should understand that the learning process is changing and should be aligned with the relevant technologies used in this process. It is understood that students would positively accept the use of online technology for teaching and learning, provided the academics portray a positive attitude, behaviour, and assertiveness in using these technologies for teaching purposes. Hence, the background of academics is significant in this context, since they are the ones who should lead in adopting online technologies for teaching and learning. Certainly, the connectivism learning theory is apt for engaging the collected data in this study.

RESEARCH DESIGN AND METHODOLOGY

This section focuses on the research design and the methodology that has been employed for this study.

Research design

Research design can be described as a comprehensive plan for linking conceptual research problems to appropriate and attainable empirical research (Asenahabi, 2019). Furthermore, Creswell (2014) defines it as a blueprint for scientific research, which provides an explicit guide for procedures in an investigation. Scientific research should be informed by the apposite research design to generate reliable findings. For this study, the exploratory research design was employed as a blueprint for the investigation. Bitsch (2005); Wimmer and Dominick (2014) describe exploratory research design as an important blueprint to explore a given phenomenon. Academics' perspectives on using technology for teaching and learning; their understanding of the relationship between curriculum development and the use of technology for teaching and learning; opportunities and challenges in technology for teaching and learning were explored through the exploratory research design.

Thus, these main themes directed the approach in which the data were collected from academics. Moreover, this design also included the overall discourse, qualitative research method, population, and sampling method applied data collection instrument, and the way in which the data were analysed. Accordingly, the subsequent section explains these methods and techniques applied taking into account the purpose of the study.

Methodology

This section focuses on how the study was conducted. This is a qualitative study as proven by the methods and techniques applied in the sampling of the population, data collection, and analysis. Jackson, Drummond and Camara (2007, p. 22) describe the methodology as the "identification and utilization of the best approach for addressing a theoretical or practical problem". The qualitative method suggests that the investigation should be conducted with the purpose to examine without any amplification of the data and findings. Bless, Higson-Smith and Kagee (2006) submit that the qualitative method entails the investigation of a matter in its natural form. Thus, this method enabled the research to collect significant data from suitable participants. For this study, qualitative methods were employed in sampling of the population, data collection, and analysis. Semi-structured interviews were used to collect data from academics in a rural-based institution of higher learning, and reflexive thematic analysis was adopted to analyse the data.

Population and sampling

This study sought to explore academics' perceptions of the development and delivery of curriculum for online teaching and learning in a rural-based university. Thus, purposive and convenient techniques within the non-probability sampling method were used to sample the institution of higher learning and the participants respectively. Bhardwaj (2019) submits that the purposive sampling technique is perfectly used when you sample the members of the population according to the purpose of the study. This technique is sometimes known as the judgmental sampling technique. That is when the researcher knows more about the subjects (Ames, Glenton & Lewin, 2019). Thus, a selected rural-based university in Limpopo province of South Africa was purposefully selected for this study. The selected institution of higher learning is in a rural area of the Limpopo province, and it is classified as a former historically disadvantaged higher learning institution in South Africa. It was significant to select such an institution to understand its academics' perceptions in developing a curriculum for online teaching and learning. The institution was selected because of its location, and the fact that it is still catching up with adopting technology for teaching and learning. On the other hand, the convenience sampling technique was used to sample academics for this study. Taherdoost (2016) indicates that the convenience sampling technique has to do with sampling participants for the study due to their availability. This sampling technique was suitable for the study since any lecturer could form part of the study regardless of their sex, age, and/or subject field they belong to. Thus, academics from a rural-based university were conveniently sampled to take part in the interview for this study.

Data collection

According to Creswell (2014), data collection is an important stage of the scientific research process. This stage is regarded as one of the significant processes of strengthening an investigation. Semi-structured interviews were adopted as a data collection instrument for this study. Ruslin, et

al. (2022) suggest that this data collection instrument is most pertinent when seeking a profound probe into a phenomenon where little knowledge exists, or a different opinion is pursued. Thus, for this study, semi-structured interviews were applied to engage academics in seeking their perspectives regarding the development of the curriculum for online teaching and learning in a rural university. This data collection instrument enabled academics to express their views. The interviews with five academics were conducted and moderated by the researcher. The interviews were conducted virtually using Google Meet instead of the face-to-face format. The researcher recorded the sessions for easy transcription with the consent of all the interviewees. A semi-structured interview permits both the researcher and the participants to divert a little bit if the notion is to be followed in detail. When using this data collection instrument, a researcher still uses a general outline of themes and questions, which can be broadened when the need arises (Wimmer & Dominick (2014). In this method, questions can be asked to participants in different ways, considering the context.

There was a set of questions that aided in guiding the data collection process, i.e., the data collection process was not conducted haphazardly. The subsequent questions were drafted to guide the study:

a) What is the relationship between curriculum development and the adoption of new online technologies for teaching and learning?

b) What challenges did you face with curriculum development and delivery when transitioning from face-to-face to online teaching and learning?

c) What are the opportunities presented by using online technology for teaching and learning in a rural university?

d) What are the challenges presented by using online technology for teaching and learning in a rural university?

e) In your opinion, do academics possess the required skills to develop a curriculum that suits online teaching and learning?

f) What are the measures do you recommend should be taken to enhance the use of online technology for teaching and learning?

These significant issues guided the core of the subject under investigation. Academics shared their perspectives based on these key questions. Thus, the developed themes emanating from the questions that were asked to the academics. Hence, reflexive thematic analysis was used to analyse the collected data.

Data analysis

Bhatia (2017, p. 16) defines data analysis as the significant process of "scrutinizing raw data to draw conclusions about that information." For this study, reflexive thematic analysis has been employed to analyse the collected qualitative data. Braun and Clarke (2006) define reflexive thematic analysis as "an approach to analysing qualitative data to answer broad or narrow research questions about people's experiences, views and perceptions, and representations of a given phenomenon." As the study explored academics' perceptions in the development and delivery of curriculum for online teaching and learning in a rural-based university, it was of significance to apply reflexive thematic analysis to develop themes to clarify the findings. This method of data analysis enabled the researcher to examine different perceptions shared by academics and encapsulate a large volume of data (Braun & Clarke, 2006). There are six steps to be followed when one conducts a thematic analysis as outlined by Braun and

Clarke (2006). These steps include familiarising oneself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming the themes, and producing the report. The researcher followed these steps in analysing the data.

Ethical considerations

Fleming (2018) submits that ethical considerations are significant in ensuring that the rights of the participants are upheld. Some of these privileges include the right to remain unanimous and to give consent to participate in the study. These ethical issues demand that the researcher should uphold these rights and ensure that during and after the process, research values such as honesty, objectivity, confidentiality, and avoiding conflict of interest are safeguarded. Thus, the researcher approached all the respondents with a clear explanation of the study and the significance of participating in a study of this nature. Accordingly, the researcher sought the consent of the participants to take part in this study. The researcher also confirmed that the participants' identities have been concealed. The participants understood the importance of participating in this study and they did so voluntarily.

DISCUSSION OF FINDINGS

The following discussions and the developed themes emanate from the data that were collected from academics.

THEMES

Theme 1: Curriculum development and the use of technology for teaching and learning

Academics strongly embrace the link between curriculum development and the pedagogy chosen to deliver such a curriculum at a given time. The respondents highlighted that since most institutions of higher learning adopted online and multimodal teaching and learning approaches with the advent of the Covid-19 pandemic, there is a need to review the existing curriculum and develop one that is appropriate for the adopted method of teaching and learning. Some of them shared their views in this way:

> *The issue of curriculum design or development is interwoven with how the teaching and learning are delivered, whether it is mobile learning, or e-learning or open distance learning. That is quite imperative for curriculum designers to take note of these issues. (Respondent 2)*

> *The way the curriculum is developed or designed also says scholars and academics who are involved in that process including experts from the industries, students' structures and other sectors, meaning the planning and strategies should be detailed. (Respondent 3)*

> *Whether it is a teaching strategy, or students' access and success, those facets or elements should be infused into the manner the curriculum is developed or designed. That on its own says if you are designing a curriculum for a traditional institution that opts for a face-to-face kind of teaching and learning model, the curriculum should detail how those aspects are going should be dealt with in terms of the contact sessions, assessments, etc. Some curriculums need practicum components and in that case, the online teaching model might not work in some instances, let us say someone is doing Agriculture, and they need to go to the field, and that overlaps with face-to-face engagements between instructors and students. However, in*

some programmes, such as Anthropology you might not need a hybrid model for teaching and learning because all aspects and the resources that students need can be accessed online. There is no hindrance, and this resonates with students' access and success. (Respondent 1)

Indeed, there is a blend, the strategy or teaching and learning model should be intertwined with the existing curriculum as far as the design is concerned. (Respondent 5)

Theme 2: Opportunities of using online technology for teaching and learning

Respondents were asked to explain some of the opportunities that come with online teaching and learning. Most of them indicated that one of those opportunities includes flexibility regarding how teaching and learning is conducted. Academics submit that students have the latitude to learn in the comfort of their own time and space due to the flexibility of the pedagogy.

The issue of flexibility, which is also highlighted in the teaching and learning policy of the university, you can make arrangements in terms of prerecording the sessions. (Respondent 2)

Some indicated that the online teaching and learning approach helps with archiving the lessons for revision and future use, which was impossible with the face-to-face learning approach.

There are positives indeed, one would talk about a repository, we are able to archive and store the lessons for future use, some would even pre-record the lecture session and upload it, and then students would listen in the comfort of their own time. Students can revisit and use these recordings for revision. (Respondent 4)

It has improved how we document our teaching materials. All lecturers are obliged to store their study materials through learning management systems such as Blackboard. (Respondent 3)

Another benefit of online teaching and learning as indicated by the respondents has to do with the facilitation of communication and collaboration among students and lecturers. As one of them shared this sentiment:

You can also use other platforms such as Facebook or WhatsApp to stimulate communication among students and academics that makes things easier, for students to directly communicate with their lecturers. (Respondent 1)

Theme 3: Challenges of using online technology for teaching and learning.

The participants were also asked to share some of the challenges they come across as far as online teaching is concerned. Lack of resources remains a hindrance to adopting online teaching and learning in a rural-based university. Lack of monetary support leaves this kind of institution in limbo without any way forward in their core business which is to teach students. One of the respondents explained it in this manner:

Yeah, we had many challenges particularly ours as a rural university, some scholars have a different opinion, and they say it is a rural-based university instead of a rural university. The issues of resources were a major challenge because when you talk about our

students' profile, we have so many students who come from indigent families, and disadvantaged backgrounds so to say, that on its own say there is a lack of resources and infrastructure. Our students do not have access to computers, laptops, tablets, smartphones, or any gadget that makes it easier for students to learn or be part of the cyberspace for e-learning or mobile learning. Moreover, we cannot isolate mobile learning whether synchronised or synchronised, so those are the aspects of the conundrum at a rural-based university, because students had to be supported with devices, and that process was so protracted. In addition, because of this, the university was lagging in terms of rescuing the 2020 academic year at some point. (Respondent 4)

The lack of digital skills by academics also contributes to the slow pace of online pedagogy in higher education institutions. This respondent submits that some of the academics could not move along with the university when it transitioned to multimodal teaching and learning:

Well, I would say as academics we had challenges, we had to be taken through robust training to acclimatise us in terms of using the software, whether it is course management software, or how to run teaching and learning platforms. The ICT department ran those processes, and some of our colleagues struggled to keep up with the transition, it was a huge and laborious process for an institution such as ours. (Respondent 1)

Some of the respondents highlighted the need to amend the teaching and learning policy to permit the institution to move with time since the digital revolution would never go back and how teaching and learning is taking place would forever change with technology.

How the teaching and learning policy of the institution has been structured, is silent about hybrid and multimodal teaching and learning. The whole aspect of multimodal teaching and learning was a recommendation from the Department of Higher Education and Training, and some universities like ours were not well capacitated to have a smooth transition moving from face-to-face to online teaching and learning. (Respondent 3)

Challenges of repositioning the teaching and learning model come with culture; you know in the curriculum we have what we call null or hidden curriculum, so with us the null curriculum said to us, the electronic devises access and the resources that you will need to carry out teaching online including assessments was a huge challenge. (Respondent 5)

Another challenge that comes with online teaching and learning is the issue of academic integrity. It should be noted that cyberspace affords people to cheat easily, and students are engaged in academic dishonesty as far as assessments are concerned.

Another aspect that we talk about includes academic integrity, whether students would cheat online, do we know how to use the invigilation app, even today, the university does not have an invigilation app for about three years and our students have been writing summative assessments online, meaning the academic integrity is

compromised. Some of our students confirmed that teaching is rife in the cyberspace. This also has so much to say about the kind of students who are produced through this system. (Respondent 2)

Theme 4: Skills to develop a curriculum for online teaching and learning

The respondents highlighted that most academics lack the required skills to design a suitable curriculum for online teaching and learning. Nonetheless, some submit crucial training is needed to capacitate academics as far as curriculum development is concerned.

Well, I think with help from institutions that have been operating in that space, like UNISA and others that have been working with students from a distance, online or even hybrid learning, academics can play an integral role and be capacitated to design a curriculum that is applicable and convenient for online teaching and learning. (Respondent 3)

The respondents also academics are struggling to facilitate proper assessments and guard against academic dishonesty. Some of them also propose that universities should do away with exams and adopt continuous assessments.

Some of our colleagues ended up suggesting that maybe we should move away from summative assessments in a form of exams and adopt continuous assessments in a form of assignments to deal with the issue of academic dishonesty. (Respondent 4)

Theme 5: Recommendations to enhance the use of online technology for teaching and learning at rural-based universities.

As part of recommendations to enhance the adoption of online teaching and learning, academics suggest that the university should amend policies to easily permit and adopt the needed changes as far as teaching and learning is concerned.

I think our university should revise its teaching and learning policy to ensure there is flexibility, and adopt hybrid teaching and learning model that can help our students. (Respondent 2)

Some suggest that the university should adopt mobile learning to afford students a latitude to learn in the comfort of their time and space without any difficulties of the lack of resources on the premises of the university.

The issue of mobile learning, it says students can learn from wherever they are asynchronously so that on its own can help our university, especially our students in the rural areas who maybe do not have access to the high-tech technologies to be able to learn, because this model says students can access study materials via posts or courier, and it can help a lot because we know students have challenges. In this case, some of our students can learn from home without any problems. Nevertheless, the policy should also talk about these issues to ensure that we move with time, like other international universities. (Respondent 3)

As part of the recommendations, the government and the private sector are urged to dig deep in their pockets to support the previously disadvantaged institutions of higher learning to acclimatise to online teaching and learning.

Well, the government must also enhance the way they are supporting your former disadvantaged institutions of higher learning in terms of monetary support. I mean even today, most of your rural universities are still playing catch-ups when it comes to adopting online teaching and learning, not to mention the alignment of curriculum development with such digital platforms. (Respondent 1)

I would say apart from the government, the private sector should also extend its hands to support these universities with proper equipment, and provide training to capacitate the academics with the relevant skills needed to infuse online teaching and learning. The private sector is one of the major sectors that benefits from the products that are produced from these institutions. (Respondent 5)

LIMITATIONS

The study focused on academics' perspectives in developing and delivering curricula for online teaching and learning, without including other important sectors within the higher education sector. This study was conducted focusing on academics' perceptions of using online technology for teaching and learning, without taking into cognisance the opinions of students.

CONCLUSION AND RECOMMENDATIONS

The study has found that indeed the curriculum design and the pedagogical approach are interwoven. The content being taught to students, how the teaching and learning are taking place, and the way assessments are handled are all taken into consideration when designing the curriculum. This finding is related to the one established by Patton and Prince (2018). The study also found that rural universities are still lagging behind in terms of online teaching and learning adoption. This revelation is strongly supported by Coman, et al. (2020). Challenges such as lack of high-tech resources, incapacitated human resources, and lack of monetary support are some of the hindrances faced by the former disadvantaged universities. The study has also established that some academics are struggling to keep up with the pace of the digital revolution that is taking place within institutions of higher learning. This makes it difficult for such institutions to quickly embrace the ever-changing environment in the higher education sector. Lack of apt skills by academics would results in snail pace and frustrations when dealing with technology for teaching and learning, and ultimately has an undesirable consequence on students. This was also established by Mpungose (2020). Rural-based universities also find it difficult to come into agreements and partnerships with private sectors that are involved in developing adequate learning management systems to assist in teaching, learning and assessments. As a result, the lack of soft wares for adequate assessments leads to a lack of academic integrity and a bad reputation for the institution and the graduates.

This paper recommends that further research should be conducted focusing on students' perceptions of curriculum development and delivery using online technologies. Further study should be conducted on the role of the department of higher education in assisting rural institutions of higher learning in adopting technology for teaching and learning. This paper also recommends a study on the rural universities' adoption of technology for teaching and learning juxtaposed with the socio-economic

challenges faced by the communities they serve. Further studies should be conducted on the use of social media platforms including for teaching and learning in higher education.

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