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The teacher's competence implementation of lower secondary schools in the northern Zanzibar: Effects of flipped classroom model

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Abstract

Implementing competency-based curricula and flipped classroom models in Zanzibar's secondary schools presents both challenges and opportunities. This study examined the correlation between teachers' competencies and the adoption of the flipped classroom model, especially among those trained in conventional pedagogical methods. Key obstacles include limited IT skills, reluctance to adopt digital tools, insufficient parental support, inadequate teaching resources, and a lack of tech-proficient educators. A descriptive correlational design was used, surveying 400 respondents from 26 lower secondary schools in Zanzibar's Northern Region. Data were collected through the Teachers' Competence and Flipped Classroom Model of Teaching Questionnaire (TCFCQ) and analyzed using frequency distributions and Spearman rank correlation at a 0.05 significance level. Findings showed significant positive correlations between the flipped classroom model and four teacher competencies: classroom management ($\rho = 0.188$), instructional delivery ($\rho = 0.195$), formative assessment ($\rho = 0.648$), and communication ($\rho = 0.509$). While classroom management and instructional delivery were relatively strong, assessment and communication skills need improvement for effective flipped learning integration. The study recommends targeted professional development and greater government investment in digital pedagogy, technology integration, and instructional design to enhance teachers' competencies and improve student learning outcomes in secondary education.

Keywords: Format, Microsoft word template, Style, Insert, Template

Introduction

The competence-based curriculum and flipped classroom models in secondary schools present challenges and opportunities for teaching and learning in Tanzania to scale, mainly in the northern region of Zanzibar. While teachers in Tanzania struggled with competence-based curricula, studies in other contexts have shown positive outcomes from flipped classroom models, as demonstrated in this study. This makes the teacher an indispensable tool in the teaching and learning environment. Hence, competence becomes imperative when describing the complex nature of shared knowledge and understanding complex elements, such as values and attitudes, aiding the effective teaching of human disposition globally (Elliot, 2015).

Generally, competency connotes teaching the practical form of empathy, the value of diverse perspectives, and a commitment to promoting equity and global engagement (Tao and Burtseva 2024). However, an improved method of teaching usually relies on the teacher and requires competencies that may be considered as knowledge, skills, and behaviour (Adeyemi, 2016). The influence of technological demands and social impact changes, especially the flipped classroom model of teaching and learning, has made teaching challenging, particularly for those trained in traditional teaching strategies. Secondary schools in the northern town of Zanzibar, with no professional development opportunities for their teachers, struggle to reverse this approach and blend face-to-face and flipped classroom pedagogy, abandoning plans that aim to implement blended learning in secondary schools (Sohrabi and Iraj 2016).

Tanzania developed a skill competency-based curriculum in 2005 to enhance the educational services provided to students. However, must be noted that 86% of teachers do not have an adequate understanding of the objectives of the competency-based curriculum system, and 78% of teachers do not incorporate these objectives into lesson planning (Komba & Mwandanji, 2015). Competency-based education aims to equip individuals with essential knowledge, skills, and attitudes for effective public service, enabling learners to apply experiential knowledge to perform outcomes spanning the military, academic, and corporate domains (Chyung et al., 2006; Hatcher et al. 2013). The focus of education now is to ensure that residents of a country, in this case Tanzania, are well educated and competent enough to advance economic productivity for a country that is still developing (Chacko, 2014). Despite their potential, teaching and learning in classrooms are still the same, where learners are required to remember all the information provided during classes and reproduce it for exams to advance to

higher levels of education as well as formal employment. It is further noted that most teachers' pedagogical skills are lacking because of inadequate training in implementing competency-based curricula. As a result, traditional approaches to teaching and assessment still prevail, indicating a lack of teacher motivation, competence, and even understanding of policy frameworks (Whipp & Salin, 2018).

Literature Review

The development of competent teachers is a function of the quality of a competency-based program, particularly its curriculum and instruction (Fraser et al., 2007). This is because it appears that graduates of competency-based teacher education programs in Tanzania are unable to implement competency-based curricula at the secondary school level (Mkimbili & Kitta, 2019; Paulo&Tilya, 2014). Typically, teachers in schools perpetuate the default practice of teacher-fronted content delivery, which centres on knowledge acquisition instead of idea generation (Paulo & Tilya, 2014). Teachers lacked relevant knowledge and skills and, therefore, could not apply the appropriate competencies at the core of the pedagogical framework and did not use a competent approach to teaching.

In the past, teacher competence in Zanzibar was primarily evaluated using traditional teaching methods, as in many other parts of Tanzania. Teachers are expected to possess a strong command of subject knowledge and to deliver information through face-to-face classroom instruction (Patrick et al. 2013). This strategy emphasised the instructor as the main contributor to information and students as receivers. However, with the rise of the flipped classroom framework, teachers' professionalism has been viewed differently. In this approach, students attend learning materials, such as lectures or instructional videos, prior to class, while class time is devoted to interactivity, discussions, and problem-solving activities (Komba & Mwandaji, 2015). In Zanzibar's context, adopting and implementing a flipped classroom model may face certain challenges. Access to technology and reliable Internet connectivity can be limited, which can hinder the distribution and access to online learning materials. Furthermore, there might be a need to train these teachers and design appropriate professional development courses for them to implement the flipped classroom model (Mkimbili & Kitta, 2019)

Additionally, a competency-based curriculum (CBC) enables learners to acquire learning skills, task performance, and collaboration with other people (Komba & Mwandaji, 2015). A Review of Teacher Preparation in Tanzania in 2005 reviewed School-Based Instructional Supervision Capacity (SBISC) of the school leaders for the implementation of Competence-Based Curriculum in Zanzibar was conducted in the West Urban Region, particularly at the Urban and West B District schools in Zanzibar was found to be problematic, despite its operation of nearly fifteen years (AAP,2005). Thus, these school leaders have failed to support teachers in competence-based instructional planning, instructional delivery in the classroom, and competence-based assessment to enhance their school-based instructional supervision capacity (Komba & Mwandaji, 2015).

Theoretical Framework

The study focused on the competency theory of Medley (1977), which states that teacher competency is defined as any single knowledge, skill, or professional value position with regard to the practice of teaching believed to be relevant to the successful implementation of the profession's teaching. Competence is associated with the teaching profession regarding teaching ability, a set of attributes or skills that a teacher possesses in a given situation. It also refers to five components of teacher competence: classroom management, instructional delivery, formative assessments, communication policies, and skills. Medley's theory was used as the primary theoretical framework in this study. Thus, these five components of teacher competence provide a guiding framework for researchers. For instance, competency theory, rooted in Medley's (1977) work, emphasises the importance of specific skills and knowledge for effective teaching, and the elements of classroom management skills revolving around teachers' ability to effectively deal with learners' disruptive actions (Rubow et al., 2018). Hence, a combination of proactive management strategies, clear rules and procedures, and targeted interventions can significantly improve classroom behaviour. Group contingencies, self-management techniques, and teacher-focused interventions have shown promise in reducing disruptive behaviours and promoting a positive learning environment (Bolstad & Johnson, 1972; Murphy et al., 2006; Reinke et al., 2014).

Medley's (1977) Competency Theory examines specific teachers' skills and pedagogical dynamics relevant to classroom engagement, including the instruction and learning environments. The competencies theory of classroom management establishes a set of standards pointing towards how teachers are able to manage the classroom behaviour of learners and disruptive actions in class environments (Emmer & Evertson, 2016; Marzano, Marzano, & Pickering, 2003). Class time is usually composed of collaborative and enquiry-based learning when the flipped model is applied. Hence, a high level of control holds learners' attention and reduces off-task behaviour (Strayer, 2012). Evidence indicates that effective management of classroom activities in a flipped classroom translates to better motivation, achievement, and learning (Kim, Kim, Khera, & Getman, 2014).

Instructional delivery could be linked to external factors that enhance the effectiveness of flipped learning, such that teaching needs are systematic, goal-oriented, and structured in ways that promote learning mastery (Bloom 1968) principles. Teachers need to develop content that facilitates learning using basic class resources, such as videos and readings, to reinforce active participation and engagement strategies (Bergmann & Sams, 2012). Well-planned instructional strategies in flipped classrooms reflect higher-order thinking skills and learners retention to recall previous learning activities (Chen, Wang, & Chen, 2014). Moreover, scaffolding processes such as formative assessments enable

educators to monitor progress and make available data that can be used to refine instruction and aid students in receiving the support needed for success in flipped learning environments (Black & Wiliam, 1998; Schmidt, Wagener, & Sutherland, 2020). Quizzes, peer assessments, and feedback in a flipped classroom are meant to guide learners toward achieving learning targets, while providing teachers with ways to address gaps in knowledge (Sadler, 1989). Hence, through performance data, the teacher can determine the most effective instructional methods (Dweck, 2006). However, communication competence skills are valuable to learners who perceive empathy and regard, including self-alienation, as effectuated by the focus of a flipped classroom model. Communication among students and teachers can be instrumental in determining and fulfilling high behavioural expectations, encouraging positive relationships, and aiding interactions that build a willingness to participate in the classroom (Brophy, 2006). In the context of flipped learning, learners participate before and during class activities in different modes of the flipped learning environment. (Kim et al., 2014).

The conceptual framework shows the independent variable, teachers' competence, and the dependent variable, the flipped classroom model. 5. Teachers' competence was categorised into classroom management, instructional delivery, formative assessment, and communication skills, while the flipped classroom teaching model reflected flexibility, learning culture, intentional content, and professional education attributes within the instruments of enquiry. Gannod (2008) explored the application of the flipped classroom model in a software engineering class, emphasising on learning resources, class time, group sessions, comprehension, and real-world challenges. In this regard, Lage, Platt, and Treglia (2000) conducted a study using an inverted classroom paradigm for teaching economics in which students worked in groups to perform economic experiments as a part of class activities, and it was noted that students appreciated the use of a flipped class model. Other studies have noted that the effectiveness of teaching relative to learning objectives depends on teachers' instructional methods and competencies, which may refer to knowledge, skills, and behaviour (Adeyemi, 2016). Many secondary schools have experienced difficulties with teachers using both blended and remote teaching techniques. Building knowledge at home and engaging in collaborative work with peers in the classroom (Ilyasanti et al., 2017). Therefore, the application of flipped learning requires students to be motivated to acquire knowledge and perform effectively in class, which means that if students are not willing to participate in online learning, this model becomes ineffective for everyone with fewer provided resources (Moffett & Mill, 2014; Moore & Chung, 2015).

Hence, the reviewed studies offer meaningful contributions regarding specific competencies associated with management skills, instructional delivery, formative assessment, and communication skills, which are essential for implementing teacher effectiveness in technology-enhanced teaching and learning. The basis of these findings resides within Medley's competency framework from 1977 and reiterates that timeless pedagogical skills remain fundamental to the integration of instructional technology. A concise appraisal of the literature demonstrates how meeting these competency standards enables educators to harness the potential of flipped learning to transform classroom management, instruction, assessment, communication, and overall student engagement in dynamic and interactive learning environments.

Statement of the Problem

The challenges faced by lower secondary schools in Tanzania, especially in the northern region of Zanzibar, revealed that teachers were not competent in using technology, which is essential for the implementation of the flipped classroom model. Learners lack the skills to engage professionally, attributing incompetent digital skills and unwillingness. Conventionally, teachers engage most with students who ask questions and pay attention to them during class. It has also been reported that certain challenges facing the implementation of the flip-classroom model could be linked to poor student academic achievement based on lower education standards (MoEVT (2009), lack of parental support, material resources (computers), television, smartphones, and teachers' digital skills (TCU2018). Given the existing literature on the advantages of implementing a flipped classroom model, the researcher explored the notable correlation between teachers' competence and the implementation of the flipped classroom model of teaching in lower secondary schools.

The objectives outlined below were designed to assist in guiding this study.

1) To analyse the correlation between teachers' classroom control and the use of the flipped teaching model.
2) To assess the correlation between teaching approaches and the use of the flipped teaching model.
3) To evaluate the correlation between students' learning outcomes through formative assessments and the use of the flipped teaching model.
4) To study the communication skills of teachers and utilization of the flipped classroom model.

Hypothesis

1) There is no statistically significant connection exists between teacher classroom management skills and the use of the flipped classroom model.
2) There is no relationship between teaching methods and the applied instructional delivery of the flipped classroom model.
3) There is no relationship between formative assessment and the adopted instructional delivery of the flipped classroom model.
4) There is no notable relationship between teaching communication skills and implementing the flipped classroom model.

Research Design

This study used a descriptive, correlational survey design to explore the relationship between teachers' competencies and the effectiveness of the flipped learning model involving teachers' competencies as linked to the flipped classroom model.
The design captures current practices, aligning with Lokesh's (1984) view that descriptive studies effectively capture precise information about phenomena. The study involved 400 respondents from 26 lower secondary schools across the Northern Region of Zanzibar participated in this study with samples including 309 teachers, 26 headteachers, 43 deputy head teachers, and 22 subject coordinators from eight constituencies: Chaani, Matemwe, Mkwajuni, Nungwi, Tumbatu, Kitope, Donge, and Bumbwini.

Data were gathered using the "Teachers Competence and Flipped Classroom Model of Teaching Questionnaire" (TCFCQ).
The questionnaire was structured into three sections: Section A collected demographic information, Section B focused on teacher competence, and Section C examined the implementation of the flipped classroom model. The respondents are to rate each statement on a four-point Likert scale, strongly disagree (1), disagree (2), agree (3), and strongly agree (4). To ensure the reliability of our instrument, Cronbach's Alpha was computed with an overall reliability of 0.97, indicating high internal consistency, while the content validity index CVI derived 0.92, relatively higher than the benchmark of 0.7 (Fisher, 2004); the collected data were analysed with SPSS software. Hence, the Spearman rank correlation coefficient was employed to determine the magnitude of the relationship between teacher competence and the flipped classroom model, with a significance level set at 0.05.

Results

Figure 1 reveals that the majority of the respondents had worked for a few years, between five and nine years, showing that 31.8% of respondents were the highest, followed by 14 years with 24.5% of the respondents, while 23.5% of respondents worked for one year to four years, and 31. %, and there were those who worked for 10 years to 14 years, which is 20.3%. What can, therefore, be deduced from this is that secondary schools in Tanzania employ people with various work experiences for better service delivery.

Figure 1: Work Experience of the Respondents

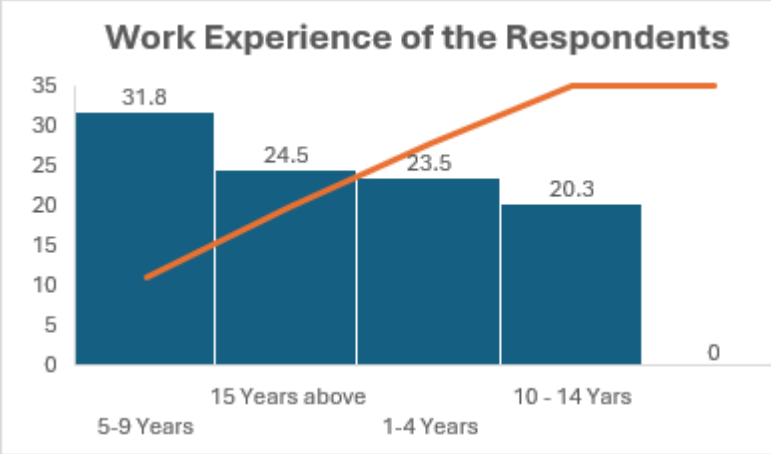

Figure 2: Position of the Respondents

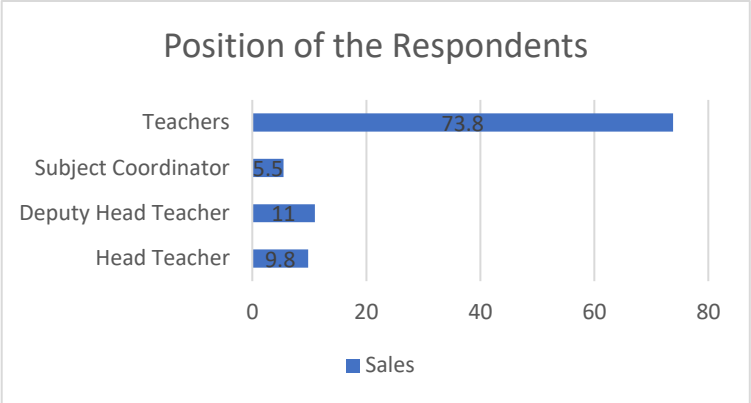

Figure 2 shows that the respondents were teachers, with 73.8% as the majority, followed by deputy head teachers (11 %), head teachers (9.8 %), and subject coordinators (5.5 %).

HO1: Teacher classroom management skills and flipped classroom model.
The table 1 shows a significant connection between classroom management skills and the flipped classroom model. Although the correlation coefficient ($\rho = 0.188$) was relatively low, it revealed a weak yet significant relationship. This implies that classroom management skills affect the flipped classroom model. As $p = 0.000 < 0.01$. Hence, we reject the null hypothesis.

Table 1 HO1: Teacher classroom management skills and flipped classroom model

Spearman's rho			
Variable	Correlation Coefficient (r)	Significance (**2-tailed**)	Sample Size (N)
Instructional Delivery	1.000	<0.01	400
Flipped Classroom Model	0.195**	0.000	400

**The significance level is presented as (p < 0.01)

HO2: Teaching instructional delivery and flipped classroom model.

The table 2 reflects a significant relationship between instructional delivery and the flipped classroom model. However, the relationship coefficient of (ρ=0.195) indicates a weak correlation. As a result of p = 0.000 < 0.0. Thus, we reject the null hypothesis. Hence, instruction delivery significantly affected the effective implementation of the flipped classroom model.

Table 2 HO2: Teaching instructional delivery and flipped classroom model.

Spearman's rho			
Variable	Correlation Coefficient (r)	Significance (**2-tailed**)	Sample Size (N)
classroom management skills	1.000	<0.01	400
Flipped Classroom Model	0.188**	0.000	400

**The significance level is presented as (p < 0.01)

HO3: Teacher's formative assessment and flipped classroom model.

The table 3 reveals a relationship between formative assessment adoption and the flipped classroom model, with Spearman's (r) ρ= 0.648, showing a moderate to strong positive relationship. In other words, formative assessment affected the success of flipped classrooms in Zanzibar. Hence, based on the rule that p = 0.000 < 0.01, we reject this hypothesis.

Table 3 HO3: Teacher's formative assessment and flipped classroom model.

Spearman's rho			
Variable	Correlation Coefficient (r)	Significance (**2-tailed**)	Sample Size (N)
Formative assessment ability	1.000	<0.01	400
Flipped Classroom Model	0.648**	0.000	400

**The significance level is presented as (p < 0.01)

HO4: Teacher's communication skills and flipped classroom model.

Hypothesis four shows a significant relationship between the communication competence of teachers and the flipped classroom mode with a (ρ = 0.509) Spearman's correlation coefficient of moderately positive correlation. Given p = 0.000 < 0.01. Hence, hypothesis four is rejected.

Table 4 HO4: Teacher's communication skills and flipped classroom model.

Spearman's rho			
Variable	Correlation Coefficient (r)	Significance (**2-tailed**)	Sample Size (N)
Communication competence of teacher	1.000	< 0.01	400
Flipped Classroom Model	0.509**	0.000	400

**The significance level is presented as (p < 0.01)

Discussions

This study investigated competencies and the flipped classroom model correlational determinants. Teacher competency revolves around classroom management skills, instructional delivery abilities, formative assessment models, and communication competency skills. However, based on this hypothesis, the results revealed moderate and low correlations within the conceptual framework mapped to out-of-classroom engagement, which is called the flipped model of teaching in Zanzibar, Tanzania. This aligns with the existing literature that appreciates the role of teacher participation by highlighting the importance of prompt feedback and student interaction in enhancing learning outcomes in flipped classrooms (Harso et al., 2024; Jia et al., 2023). Flipped classrooms greatly benefit from addressing diverse learning needs, which are made possible through tailored teacher feedback, as whole-class instruction is replaced with individualised sessions (Harso

et al., 2024). Moreover, effective interaction and communication, defined as the functional relationship between students and teachers in a classroom, enhance teaching effectiveness (Jia et al., 2023). Scholars have suggested that the flipped classroom model has the potential to aid learners' needs (Clark, 2015). Hence, technology can help teachers positively improve student achievement.

The flipped classroom model in Zanzibar schools revealed a statistical significance of ($p=0.000 < 0.01$). However, the results stressed a weak relationship revealed by the correlation coefficient ($\rho = 0.195$), which indicates a low positive correlation, and there were certain levels of impact of instructional delivery to aid productivity among the learners (Olasunkanmi & Lawani, 2023) when exposed to the flipped classroom model, aligning with Touchton (2015), who demonstrated in a quasi-experimental study, revealing that the flipped learning strategy reflects positive changes in instructional delivery. Although the positive relationship is weak, the fact that the null hypothesis is disproved indicates that at least some change in outcome is indeed possible based on the method of instruction used in a flipped classroom scenario. Similarly, Baytiyeh (2017) investigated the qualitative aspect of the flipped classroom model, revealing students' perceptions of enhanced learning in a technology-enhanced delivery approach to the flipped learning. Research in diverse disciplines has confirmed that instructional delivery methods significantly impact students' class engagement, attendance, and overall learning outcomes (Miras et al., 2021; Nanjundaiah & Anuradha, 2024). Collectively, these studies demonstrate that even a small, statistically significant positive correlation has a strong impact on educational results.

While formative assessment revealed moderate to strong positive effects on the success of the flipped classroom model in Zanzibar, the correlation statistics observed as ($\rho = 0.648$) provide significant proof that formative assessment impacts learning outcomes in flipped classroom activities and reduces cognitive loads through continuous, targeted learning engagement. (Jiménez et al., 2022; Lu et al., 2023). Therefore, with a p-value < 0.01, it is reasonable to state that the null hypothesis can be rejected, claiming that in this context, formative assessment is an important predictive element of success in flipped classrooms. Studies support the significant role of formative assessment in a flipped learning environment. For instance, Jiménez et al. (2022) argued that feedback through formative assessment enables learners to assimilate instructional content and improve academic self-efficacy.

Similarly, a study highlighted that a formative evaluation framework incorporated in a flipped classroom directly contributes to motivating learning and drives engagement among learners (Lu et al., 2023). This is especially useful in places such as Zanzibar, which underlines the need to overcome the challenges posed by lecturing through formative assessment in flipped classrooms. The nature of class activities in a flipped classroom may have an impact on the level of improvement observed in student performance relative to the goals of instructional delivery (Ermann & Sams, 2014; Talbert, 2017). Even in the Northern Region of Zanzibar, lower secondary schools fail to assess students outside class because of less student control management, cheating, and copying. For the communication skills of teachers, a striking finding ($\rho = 0.509$, $p = 0.000$) revealed that those skills had a reasonable impact on the teacher communication skills impact moderated the effect of the flipped classroom model.

Regarding teacher communication skills, a notable outcome ($\rho = 0.509$, $p = 0.000$) showed that teacher communication skills had a moderately positive effect on the flipped classroom strategy, while the statistical relationship between teachers' communication skills and the effectiveness of the flipped classroom in lower secondary schools showed a moderate association, but it was still statistically significant. This outcome suggests that teachers' communication skills are among the most important factors for the effective delivery of instruction in a flipped classroom setting. Effective teacher communication assists in bringing about responsiveness in a class setting, particularly the flipped learning environment that caters to learners' needs pre-class with independent learning resources and active participation during in-class activities, and students are presumed to engage with material before class. However, prompt feedback, regular support for student learning, and discussion of issues steer learners toward higher-order thinking so as to enhance learning in innovative instructional models like the flipped classroom model (Gough et al., 2017; Erdemir & Ekşi, 2019). Integrating effective communication into teaching practices facilitates content delivery and fosters a positive classroom environment that encourages student engagement. This is especially important in lower secondary schools, where students typically require more support and guiding frameworks as they shift to assuming greater control over their learning. Thus, these findings suggest that professional development programs in Zanzibar must focus on improving teachers' instructional communication skills while taking advantage of the flipped classroom model.

Conclusion

Classroom management was found to influence learners based on the teaching and learning strategy implemented, indicating that the activity and participation of students in flipped classrooms are prevalent in student-friendly classrooms. Instructional delivery was significant, demonstrating that appropriate teaching designs and goal-driven methodologies contributed to the success of learning from a flipped classroom. However, the study found no significant relationship regarding formative assessment skills, which means that the teachers in the study may have been competent when assessing learners using this model of instruction. In addition, teachers' communication competencies had a positive relationship,

guiding learner participation and supporting student-centred approaches. There was a strong relationship between the incorporation of the flipped classroom model and teacher competencies, with an overall low average mean for teacher competencies, with particular concern for competencies related to formative assessment. This finding indicates that educators have satisfactory classroom management, instruction, and communication skills. However, additional professional training is required to improve formative assessment implementation in flipped learning environments.

Recommendations

1) The following recommendations were made based on the findings and conclusions of this study.
2) In the 21st century of rising technology and science, secondary schools in Zanzibar need, through the Ministry of Education, to start emphasizing flipped classroom teaching. For this purpose, teachers' competencies must be developed through legislation (laws), increasing sensitisation and updating courses and motivation. By doing this, a more remarkable development of the flipped classroom model will be possible in the secondary schools of Northern Zanzibar.
3) The Vocational Training and Education Authority of Zanzibar needs to organise training and seminars with secondary school teachers focusing on their competencies, particularly on formative assessment and using the flipped classroom model.
4) Schools in challenging areas should be provided with good infrastructure and modern technology, especially internet connections.

Areas for Further Research

This study does not attempt to be exhaustive regarding the integrated understanding of the flipped classroom model, given that not all schools in Tanzania were included in the research. Further research should focus on the role of government and civil society organisations in applying flipped classroom pedagogy in secondary schools in Tanzania.

Teachers' and learners' perceptions of the flipped classroom model's effectiveness in secondary education in Tanzania serve as another gap that needs to be explored.

Study Limitations

1) There are some inconceivable factors beyond the researcher's capacity to overcome
2) Extraneous variables: where beyond the researcher's control, like personal biases and honesty of respondents
3) The study was limited to only 26 lower secondary schools in the Northern Region of Zanzibar, which may pose difficulties in drawing general conclusions.

Ethical Considerations

This study was approved by the Uganda National Council for Science and Technology Ethics Committee and Kampala International University. Authorisations from different concerned bodies were obtained before the researcher embarked on the data collection.

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