

The Feasibility of Flipped Classroom Approaches: Insights from Teachers and Students in the Selected Public Secondary Schools in Tanzania

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Abstract

This study explores the feasibility of implementing flipped classroom approaches in Tanzanian public secondary schools, focusing on teacher and student perceptions, existing practices, resource availability, and strategies for adoption. Guided by Rogers's Diffusion of Innovations theory (2003), a qualitative multiple-case design was employed across secondary schools in Dar es Salaam, Tanga, and Mbeya. Purposeful sampling guided the selection of schools and participants. Data were gathered through focus group discussions, semi-structured interviews, and non-participant observations to capture participants' experiences and views. Thematic analysis was used to identify key patterns across the data. Findings indicate a limited understanding of flipped learning, with many participants equating it with traditional homework. Despite resource challenges, such as insufficient textbooks and limited ICT infrastructure, teachers and students expressed openness to the approach, mainly when supported by printed materials, collaborative learning, and parental involvement. Concerns emerged about its suitability for mathematics, where students preferred more direct instruction. The study highlights the importance of teacher training, infrastructure support, and context-sensitive strategies in facilitating flipped learning in low-resource environments. The findings provide actionable insights for enhancing engagement and learning through innovative pedagogical practices.

Keywords: *Flipped classroom, ICT access, textbook, parental engagement, Innovative Pedagogy*

Introduction

The flipped classroom is an instructional approach where students engage with interactive course content before attending class (Bishop & Verleger, 2013; Hwang et al., 2015). During class, the focus is on applying knowledge through discussions, problem solving, or collaborative activities (Enfield, 2013; Farag & Haroun, 2020). Students become active participants both before and during class time, while teachers play the role of facilitators to

guide learners through activities that reinforce and extend students' prior learning (Enfield, 2013; Hwang et al., 2015).

The flipped classroom approach has demonstrated success in improving student learning by fostering student-centred learning through increasing engagement, collaboration, and learning motivation, as well as improved grades (Fung et al., 2022; Howell, 2021; Hung, 2015; Jdaitawi, 2020; Kim, 2017). Unlike traditional pedagogical methods, where instruction occurs during class time, the flipped model requires students to engage with learning materials before the class, freeing up classroom time for active and collaborative activities that strengthen their understanding (Bishop & Verleger, 2013; Hwang et al., 2015). The pre-class learning materials have mainly been provided to students regarding video lectures (synchronous/asynchronous) or readings.

Although recently, around the globe, there has been a growing recognition and movements to adopt innovative teaching methods like flipped approaches to enhance student learning (Baig & Yadegaridehkordi, 2023; Kim, 2017; Zhang et al., 2024); most countries, including developing countries, are struggling to ensure that they take advantage of this pedagogical innovation. In Tanzania, for instance, the ongoing educational changes insist on innovative teaching methodologies to foster students' active learning, competency mastery, and collaborative learning (Tanzania Education and Training Policy, 2014 (2023 Edition)). According to the literature, these aspects are well reflected in a flipped classroom setting (Enfield, 2013; Farag & Haroun, 2020).

However, Rahman et al. (2020), who did a meta-analysis, reported that most accessed literature on flipped classroom approaches presents findings from well-resourced settings. For example, scholars like Yang and Chen (2020) reported on the adoption of flipped classroom approaches in China, while Shelly et al. (2015), Fung et al. (2022) reported the same in Australia, as well as Howell (2021) in the UK. On the other hand, there is a scarcity of empirical studies examining the feasibility of implementing the flipped approaches within the unique context where technological resources are constrained, like Tanzanian public secondary schools (Patrobas et al., 2023).

In Tanzania, public secondary schools often face significant infrastructural and technological challenges that limit the feasibility of adopting technology-dependent instructional models such as the flipped classroom. Studies by Joseph (2021), Kiwonde (2024), Kweka and Ndibalema (2018), Malekani (2018), Ndume et al. (2021), and Patrobas et al. (2023) have highlighted persistent issues, including limited access to computers, unreliable electricity

supply, poor internet connectivity, and insufficient teacher training in digital pedagogy. These resource constraints create significant barriers to the successful integration of flipped learning in Tanzanian classrooms.

Considering the benefits of flipped classroom approaches, it is imperative to assess the current levels of understanding and practices of flipped approaches (if any) among teachers and students and identify potential challenges and opportunities to include this teaching approach in secondary education.

Thus, this study presents information on the feasibility of flipped classroom approaches in Tanzanian public secondary schools regardless of the challenge of the digital divide. Addressing this information gap is crucial to informing policymakers, practitioners, and other education stakeholders about the feasibility of flipped classroom approaches in Tanzania's secondary education system. To achieve the stated aim, this study was guided by four research questions, which were:

- i) How aware are teachers and students of flipped classroom approaches?
- ii) What current practices align with flipped classroom principles?
- iii) What infrastructure is available to support flipped classrooms?
- iv) What strategies can be used to encourage the adoption of flipped classrooms?

Along with those research questions, Rogers's Diffusion of Innovations (DOI) Theory has been used in this study to explain and understand how innovations are adopted, spread, and sustained within a social system. The theory has been relevant to examining the feasibility of flipped classroom approaches in Tanzanian public secondary schools since it offers insights into how teachers and students develop awareness, adopt practices, and adapt to infrastructure challenges while guiding strategies for effective implementation (Jdaitawi, 2019).

Not only that, but the aspect of compatibility and trialability, as per DOI theory, highlights the existing practices and opportunities for a flipped classroom approach. In addition, the relative advantage and complexity attributes of DOI have been used to explore how resources and infrastructure could impact the adoption of flipped classroom approaches in secondary schools in Tanzania (Fung et al., 2022). By addressing awareness, practices, resources, and implementation strategies, the DOI theory has been used to explain a comprehensive evaluation of feasibility (Fung et al., 2022; Hung, 2015; Rogers, 2003).

Methodology

This exploratory study used a qualitative approach to assess the feasibility of flipped classroom approaches in selected public secondary schools in

Tanzania. The method, as recommended by Creswell and Poth (2018), Flick (2014), and Yin (2016), was chosen to generate insights, explore concepts, and identify areas for future research. The population of this study consisted of teachers from five secondary schools (one in Mbeya, two in Tanga, and two in Dar es Salaam), as well as students from three schools: one in Tanga and two in Dar es Salaam. The total number of teachers from each school ranged from 30 to 50, resulting in a population of around 180 to 210. Similarly, the student population in O-level secondary schools was approximately 1,800 students.

Qualitative data were collected from 17 teachers from five Mbeya, Tanga, and Dar es Salaam secondary schools. These teachers were purposefully selected to represent key subject areas: Science/Mathematics, Language, and Social Sciences. The inclusion criteria required participants to be full-time public secondary school teachers actively teaching one of the three targeted subject areas and having at least two years of teaching experience. Teachers also needed to be willing to participate and available during the data collection period. Among the 17 participants, 10 were female and seven were male, aged between 29 and 55. Six held diploma qualifications (four of whom were pursuing bachelor's degrees), and 11 held bachelor's degrees.

As mentioned earlier, the other group of participants consisted of 33 students from three different secondary schools: one from Tanga and two from Dar es Salaam. The selection of schools was based on representatives from schools with computer labs that support the implementation of innovative teaching approaches, such as the flipped classroom, as well as their accessibility and willingness to participate in the study. Schools without ICT infrastructure were also included to represent that category, allowing for a comparison of their daily practices and exploring alternative ways to implement flipped pedagogy in a technology-challenged environment. The inclusion criteria for student participants required them to be enrolled in either Form One, as it is a transition level from primary education, Form Three to assess their adaptation to the school environment, and Form Four, as the candidates' class is preparing for the O-level final examination. Since the qualitative study does not require many participants, the study selected students from higher, middle, and lower performers, both girls and boys, to capture insights from all categories of students in terms of performance and gender. The final sample consisted of 10 students from Form One, 13 from Form Three, and 10 from Form Four, aged between 14 and 19 years, comprising 16 girls and 18 boys.

The descriptive research design involved no variable manipulation. Data collection tools included an observation checklist (for assessing school

infrastructure and the availability of teaching and learning materials), interview guides (for students), and focus group discussion (FGD) guides (for both teachers and students). Using individual interviews and focus group discussions (FGDs) with students was intentional and complementary to obtain rich data. Individual interviews provided a confidential space for students to share personal experiences, thoughts, or concerns they might hesitate to express in a group setting. Conversely, FGDs facilitated interactive discussions, encouraging students to collectively reflect on shared experiences and build upon each other's responses. This combination enriched the depth and breadth of student perspectives. All tools were developed using relevant literature, including Basal (2015), Li (2018), Paleczek et al. (2022), and Vajargah and Saadattlab (2014). Additionally, Rogers' Diffusion of Innovation theory attributes were used to ensure data validity and reliability (Sahin, 2006).

Researchers conducted five (5) teacher FGDs with 3–4 participants each (50 minutes). Apart from teachers, three (3) FGDs were also conducted with students. Each school had one session of FGD with about 7–10 participants, making a total of 27 students. Additionally, six (6) other students (class representatives) participated in individual face-to-face interviews. Discussions and interviews were conducted in Swahili, with occasional code-switching to English, and transcripts were translated into English.

Data were recorded, transcribed, and analysed to identify recurring themes. The researcher repeatedly read the transcript to familiarise themselves with the data and developed the main and sub-themes that emerged. This has provided in-depth qualitative insights into the potential for implementing flipped classroom approaches in Tanzanian public secondary schools.

Results

This exploratory study aimed to establish the feasibility of flipped classroom approaches in Tanzanian public secondary schools. It focused on examining students' and teachers' understanding of flipped classrooms, their daily teaching and learning practices related to the approach, the available infrastructure to support flipped teaching, and possible strategies to encourage its adoption. After the analysis, some major themes emerged regarding the study's focus. These themes from the FGDs with teachers included homework practices and related constraints, limited understanding of flipped teaching, and positive perceptions of the approach. Other themes addressed the status of available resources, limited access to ICT and textbooks, and suggested strategies for implementing the flipped classroom approach. Below is a detailed explanation of each emerging theme; the first

part presents themes from teachers, and the second part presents themes from students.

Significant Themes that Emerged from FGDs with Teachers

Homework Practices and Constraints

This is one of the major themes that emerged, revealing the types and frequency of homework teachers provide students. Teachers confirmed they frequently assign past examination questions or tasks aligned with the completed lesson topics. Below is the verbatim from one of them, representing the similar responses from teachers, as he said, *"We use past papers... we give them in the evening and do corrections in the morning"* (Teacher, School 1, Tanga).

In addition, in all three regions, teachers reported that the homework completion rate is not satisfactory due to some challenges that students face in their home environment. These challenges are linked to limited learning resources, household responsibilities, and a lack of parental support. To support this, one of them said *"...They don't do it carefully because many don't have time at home...."*(Teacher Dar es Salaam, school 2)". The other added that *"... some are busy with household chores when they get home and do not have time to study..."*(Teacher, Mbeya)". Not only those, but the other teacher also said *"... some students just play around with no one to supervise them for homework at home; I think the parents or guardians they live with often lack time and enthusiasm to supervise them"* Teacher, school 1, Dar es Salaam). The other one also concluded by saying, *"... Parents are not supportive; they think school matters end at school..."* (Teacher school 1, Dar es Salaam).

Limited understanding and Perception of flipped classroom approaches

Apart from homework practices, the findings also show that teachers had a superficial understanding of flipped teaching, associating it with independent preparation by students. Some misinterpreted it as delegating learning to parents or entirely to students. The issue of limited understanding and implementation of flipped teaching has been revealed to all teachers in this study. Below is the verbatim supporting these explanations, as one of them said, *"...Sometimes, I give my students content to study on their own when I am busy... is it like that...?"* (Teacher school 1, Dar es Salaam). The other one also asked, *"... Is it the same as when we give them the lesson notice for the whole year?"* (Teacher school 2, Tanga).

However, apart from their limited understanding of flipped classroom approaches, after being briefed about the flipped approach, teachers showed to be positive and acknowledged that flipped teaching might potentially

foster student engagement, self-confidence, and learning. In support of this, one of them said. “...*This could encourage students to be more responsible and proactive because a student who comes with prior knowledge can participate much better in class than one who has none*” (Teacher school 2, Tanga). All teachers shared this impression in all regions.

Resource Availability and Limited Access to Resources

Teachers' understanding and perception of flipped classrooms alone were insufficient to explain the feasibility of adopting the approach. Thus, the researchers were also interested in knowing the status of the available teaching and learning materials in terms of quantity and mode, for example, textbooks in soft or hard copy, ICT facilities, etc. Teachers revealed that there was a shortage of textbooks, which led them to adopt the sharing mechanisms to widen students' access to textbooks. One of them said, “...for Form One (students), we only have five English books, so students have to share them” (Teacher, school 2, Tanga). The findings revealed that this was a practice in all regions.

On the other hand, teachers admitted to having personal digital devices but with limited or no support to meet internet costs. Upon observation, both schools in Dar es Salaam had computer labs, while in Tanga, one school had a computer lab, too. Two schools, one in Tanga and one in Mbeya, did not have computer labs. The observed labs had an average of eight (8) to ten (10) desktop computers with internet infrastructure, but not connected to the internet.

In comparison, resource constraints, especially in textbooks and ICT, were universally reported, although Dar es Salaam was revealed to have slightly better access to ICT tools. So, with the availability of teaching and learning materials, it is important to note that, although teachers were very optimistic about the benefits of flipped classroom approaches, they expressed concerns about the feasibility of the flipped approach to their schools due to resource constraints and student preparedness.

Strategies to implement the flipped approach

Despite the limited access to ICT and textbooks, teachers highlighted several strategies by which flipped classroom approaches could be adopted and adapted to improve students' learning. It is good to remember that these teachers were very positive about the benefits of the approach to students' learning. So, for their students also to benefit from the adoption of the approach, they proposed strategies like the use of printed materials for pre-class preparation, assigning group-based activities to encourage collaboration, provision of guiding questions for students to explore at home,

encouraging parental involvement, as well as ICT integration with the limited ICT facilities that existed. The following are some verbatim from teachers as one of them said, *“Since most of them do not have books, lesson notes in a printed format for them to read at home could help ...”* (Teacher school 2, Dar es salaam), the other one also added, *“...we might create groups on social media..., as some parents have smartphones, so, we could share videos or notes; although on our side this also could mean extra cost...”* (Teacher school 2, Dar es salaam).

Major Themes Emerged from Students

On the other hand, themes emerged from the FGDs and interviews with students. These themes are related to those that emerged from teachers: homework and study practices, constraints in homework completion, and limited access to ICT facilities and other learning resources. In addition, other themes were limited understanding and positive perceptions of the benefits of flipped classroom approaches, although with an exception for some subjects, as well as the role of technology and home environment in learning. Under each of these themes, there are some sub-themes too. Below is the presentation of each of the emerging themes from students.

Homework and study Practices

The findings from students confirmed the findings from teachers on the type of homework that students have been given. It was revealed that students have also been given homework related to topics already covered in class, and not assignments/lesson notes to prepare for upcoming lessons. Students also reported relying on class notes and textbooks to complete their homework. Not only that, but they shared the impression that, in a situation where textbooks were scarce or unavailable, they would collaborate with peers, borrow learning materials, or use resources like computer labs (where available). As one of them said, *“...we use the notes we wrote in our exercise books to respond to the homework questions...”* (Form Four student Tanga). All students involved in this study shared this impression as a common practice.

Constraints in Homework Completion

As we may recall, teachers involved in this study complained that students mostly do not complete the provided homework assignments. Students had their reasons to explain the situation. One of the recurring constraints students mentioned was a textbook shortage, which gave them no access to the reading materials to respond to the questions. Most of these students depend on the textbooks provided by the school, which were limited to 5-10 copies for an entire subject across multiple streams and class levels. Although some students had their copies of textbooks, the number was relatively less

than half of the class, since this depends on the economic status of the family to bear the cost of buying. Students with limited access to textbooks admitted that they borrow or share with others. As we can read their words, they said, *"...we borrow and return after use; some of us live close to each other, so we share"* (Form three Student, Dar es Salaam).

It was also revealed that most students have domestic responsibilities after school, delaying homework completion until late at night. As one of them who represented most of them said, *"...I do house chores first, then schoolwork... sometimes I get tired"* (Female student, Form one Tanga).

Limited access to ICT facilities and other learning resources

Despite the limited access to textbooks negatively impacting how students dealt with homework assignments, students also revealed that access to ICT facilities was another challenge to their learning. Although some schools had computer labs, their usage was often restricted, requiring teacher supervision. In addition, the availability of a few PCs made it even difficult to accommodate all students at once when in the computer lab for study. They also reported limited home access to personal devices like laptops or smartphones. It is good to note that even those confirmed to have access to digital devices depended on their parents' devices. Below is what they had to say regarding this issue:

One of them said, *"...we Google using phones or computers in the lab or ask senior students for help."* (Form four student, Tanga), the other one also added, *"...sometimes we go to the computer room and read saved books, but the computers are few to accommodate all of us..."* (Form three student Dar); not only that, but the other one also said, *"... these computers most of the time do not have internet..."* (Form three student, Dar). The other ones also shared the issue of access to digital devices through parents, although they reported insufficient funds to meet the cost of the internet. One of them said, *"...some of us borrow our parents' phones, but data bundles are a problem."* (Form three, Mbeya) The other one also added, *"...my father downloaded e-books on his tablet, so I use that, but if he comes late at home, that means will not have access..."* (Form one student, Dar), So looking at this situation, it is vivid that high data costs and restrictions on the access and device use at school and home increase the limited ICT use.

In addition to the digital access limitation, students in both regions reported limited textbook access. For example, in some cases, an entire school had only a few (like 10 copies) of textbooks per subject per class. Although teachers provide lesson notes as a supplement to textbooks, it takes time for students to copy those notes from the blackboard, which consumes a

significant amount of students' time for learning. Thus, the best way for students to get learning materials relies on sharing textbooks in small groups or borrowing from classmates.

Limited Understanding and Positive Perception of Flipped Teaching

Just like what was revealed by teachers, students also admitted to having a limited understanding of flipped learning; some confused it with the homework or lesson notes that had been provided to them for the whole year. One said, "...oh, is it like the homework we are given...?" (Form four student Dar). The other one also asked, "... is it like the notes we are given at the beginning of a new grade, which we write for the whole year...?" (Form 1 student Tanga)"

However, after a brief introduction to flipped classroom approaches, students were very positive and ready to participate in implementing the approach. They appreciated that since flipped classroom approaches familiarise students with upcoming topics, they could be the best option to make lessons more engaging and easier to understand. The following are some verbatim from students, as one said, "...I think it is good because if you know what you are expected to learn, you understand better when the teacher teaches" (Form one, Mbeya). The other added, "...that is very good; I think it will help us explain our ideas during the lesson in the classroom." (Form three Tanga). Not only that, but the other one also concluded that "...When the teacher tells us to research first and then teaches us, the material does not feel unfamiliar, and we will understand quickly" (Form four Dar).

Subject-Specific Challenges

Although students were very optimistic about adopting flipped classroom approaches, they were concerned about subjects like Mathematics, which was frequently cited as a subject requiring teacher guidance, thus doubting if the flipped classroom approach would work. The following are some of their words regarding this: one said, "...Mathematics is quite challenging, studying it on our own without being taught first, I am not sure if it would be possible."(Form four Tanga). The other added that "...there are subjects like mathematics, it is better to be taught first, but some subjects can be self-learned" (Form three Dar).

Strategies to implement the flipped approach

Since students were optimistic about adopting flipped classroom approaches, they had some suggestions on how the approach could be implemented in their context. They mentioned strategies that could be used, such as providing notes in advance, promoting collaborative and peer-assisted learning, utilising ICT resources, and tailoring flipped approaches to subject

complexity, as ways that can enhance the effective use of the flipped approach in Tanzanian secondary schools. The following are some of their verbatim to support this as one said, “... *starting with self-study is good, especially if the learning environment is improved, for example if we can be given lesson notes...*”(Form three Student Mbeya), another one added that “...*If the teacher prepares and prints notes for each of us to study in advance. ... that would be good.*”(Form three Dar), another one also added, “...*if we are given notes beforehand, it will help us understand much better and participate during the class*” (Form one student Dar).

Discussion

This exploratory study sheds light on the feasibility of flipped classroom approaches in Tanzanian public secondary schools by highlighting key themes that reflect the students' and teachers' understanding, perceptions, challenges, and opportunities surrounding this pedagogical shift. The findings provide a comprehensive understanding of the constraints and possibilities for adopting flipped teaching in a resource-limited context like Tanzania.

Briefly, this study found that both students and teachers admitted to having a limited understanding of flipped classroom approaches and limited access to ICT facilities and other learning resources like textbooks. The findings also depicted the teaching and learning practices that have some elements of flipped classroom approaches, like the use of homework assignments provided to students after class sessions. However, despite the limited resources, both students and teachers proved to be very positive in adopting flipped classroom approaches with the hope that it is an alternative way to improve students' learning. Although students were concerned about the feasibility of the approach to mathematics learning, they were very positive that print-based flipped learning could be an alternative way to implement the approach.

As presented earlier, the present study has revealed a superficial understanding of flipped classroom approaches among teachers and students. Teachers equated it with independent study, while students confused it with conventional homework. This was not a surprising finding since flipped classroom approaches are new in Tanzania, and teachers and students need to understand them clearly. A similar situation also happened in some countries that had adopted the approach before Tanzania. For example, some literature has also reported confusion in the conception of flipped teaching from researchers, teachers, and students (Bishop & Verleger, 2013; Nederveld & Berge, 2015).

Despite the limited understanding of teachers and students on the flipped classroom approaches, after being briefly introduced to the concept, both groups were ready to adopt the approach as they displayed positive perceptions of its potential benefits, including enhanced engagement, confidence, and students' learning. As DOI theory insists, people are willing to participate in innovation after being informed of the innovations and benefits it brings (Abeysekera & Dawson, 2015; Dimitrakopoulou & Jimoyiannis, 2022; Hung, 2015; Jdaitawi, 2019; Rogers, 2003; Kim et al., 2014). For teachers and students to be ready for the adoption of flipped classroom approaches, there is a need for intensive teacher training through professional development programmes to enhance teachers' understanding and ability to implement flipped teaching effectively (Abeysekera & Dawson, 2015). Workshops and ongoing support are crucial for students as an orientation programme to prepare them for the flipped approach.

Although both groups of teachers and students were optimistic about adopting flipped classroom approaches, students in the present study showed some concern about the feasibility of the approaches in mathematics, which, according to them, requires direct teaching from teachers. Scholars like Clark and Mayer (2016) and those who reported that students often need direct teacher guidance for technical subjects like mathematics have shared a similar concern. However, Lo et al. (2017) and Zheng et al. (2020) reported that flipped classroom approaches have improved students' learning, even in mathematics subjects. In addition, Rahman et al. (2020) did a meta-analysis and found that flipped teaching improves students' engagement and learning in all subjects, including mathematics. All in all, this implies that there is a need to tailor flipped approaches to the nature of each subject to enable students to benefit from the approach in each subject.

The other issue which this study has highlighted is resource constraints, including shortages of ICT facilities and internet connectivity. Although Dar es Salaam schools exhibited relatively better access to ICT resources, the gap in infrastructure across regions is evident. A similar situation for secondary schools in Tanzania has also been reported by Joseph (2022), Kweka and Ndibalema (2018), Kiwonde (2024), Malekani (2018), Ndume et al. (2021), as well as Patrobas et al. (2023). Limited access to digital resources and functional computer laboratories is one of the challenges of implementing flipped classrooms (Bishop & Verleger, 2013; Fung et al., 2022; Hung, 2014; Jdaitawi, 2019).

In addition to the ICT facilities shortage were reported to be insufficient. Although this has been reported by Lee and Zuilkowski (2015), as well as UNESCO (2020), to be a known problem in developing countries, we cannot

deny the role of textbooks in facilitating students' learning (UNESCO, 2024). This suggests that to overcome the textbook shortage, teachers can use locally available materials, such as printed lesson notes, together with a collaboration and resource-sharing strategy, which they have used before. Similar strategies have also been used in Zambian primary schools to improve students' access to textbooks and other learning materials (Lee & Zuilkowski, 2015). This situation explains why teachers rely heavily on traditional homework practices, especially focusing more on assigning past examination questions in which students search for the correct answers independently, not necessarily referring to their textbooks.

Although homework has some benefits for students' learning, flipped classroom approaches provide more engagement and learning benefits learning (Bishop & Verleger, 2013). In addition, excessive traditional homework has been condemned for increasing the burden on students, which leads to students' inability to complete homework effectively (Kralovec & Buell, 2001). Although the problem of students completing their homework, as reported by Cooper et al. (2006), has been associated with an unsupported home environment due to household responsibilities, lack of parental support, and insufficient resources, students' learning motivation might be a contributing factor too. In another way, although an unsupported home environment could pose a challenge for implementing flipped classroom approaches, especially for day students, in a situation where students are motivated, this should not be the case. It has been well documented that flipped classroom approaches improve students' learning motivation (Campillo-Ferrer & Miralles-Martínez, 2021; Chou et al., 2021; Dan & Mohamed, 2023), which suggests that a motivated student will find a way to manage time as well as have alternative means to access learning materials.

However, apart from students' learning motivation, the role of the home environment in student learning cannot be denied (Escol & Alcopra, 2024). Thus, parental engagement is crucial to creating a supportive home learning environment (Geneta & Sarmiento, 2023; Gu & Zhang, 2023; Hoover-Dempsey et al., 2001; Pomerantz et al., 2007). Regardless of parents' busy schedules and inability to meet the cost of learning materials, research has shown that proper communication with parents has improved their engagement in helping their children to learn (Gu & Zhang, 2023).

As presented earlier in this study, despite the surrounding situation in the teaching and learning environment, teachers and students have demonstrated the willingness to adopt flipped classroom approaches. They proposed practical strategies to overcome the observed challenges of implementing flipped teaching, such as training on flipped classroom approaches, using

printed materials/lesson notes, group work, encouraging parental engagement, and integrating the few available ICT tools. These strategies have been reported to work in other places, as reported by scholars like Abeysekera and Dawson (2015), Bishop and Verleger (2013) Hoover-Dempsey et al. (2001), Kim (2017), and Lo et al. (2017). Looking at these strategies, collaborative approaches would facilitate the sharing of knowledge and learning resources, while printed lesson notes would increase students' access to learning materials; with the help of parents, the shortage of teaching and learning materials would be minimised.

Conclusion

Flipped teaching can potentially enhance student engagement and learning outcomes at different levels of education. Although its implementation in Tanzanian secondary schools is constrained by factors such as limited technological resources, lack of understanding of the approach, and disparities in access to digital tools, the positive perceptions among teachers and students indicate a foundation for gradual adoption. Its successful implementation requires addressing challenges related to resource access, teacher preparedness, and students' readiness for flipped learning.

To overcome these challenges, strategic interventions are necessary. For example, schools can expand the use of printed materials by allocating resources to print lesson notes and relevant textbook excerpts. Not only that, but organised group learning might also help foster collaboration and reduce individual dependency on ICT. Additionally, offline content distribution through USB drives or CDs might help to provide students with access to learning materials without requiring internet connectivity. In addition to that, teachers might use locally available resources, such as charts, maps, and physical objects, to create interactive learning experiences. By integrating these strategies, schools, policymakers, and educators can foster an inclusive and supportive environment for implementing flipped teaching in Tanzanian secondary schools.

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