**Transforming Traditional Classrooms: An experimental study of the effectiveness of Flipped Classroom Learning on Student Motivation in secondary schools of Dar es Salaam, Tanzania**

***ABSTRACT***

**Aims:** This study examined the impact of the flipped classroom approaches on students’ motivation in secondary schools. It emerged as a result of the growing concerns about how to address low student motivation levels in developing countries, including Tanzania, and how flipped classroom approaches could address this issue.

**Study Design:** The study employed a quasi-experimental design where both quantitative and qualitative data were gathered from students in selected secondary schools; and computed accordingly.

**Place and Duration of Study:** The study was conducted in two secondary schools in two different Municipalities, Ilala and Ubungo, in Dar es Salaam; and it was conducted in two months-time.

**Methodology:** The study involved eight classes, equally divided into experimental and control groups; where, three subjects, namely, English, Geography and Mathematics were involved. The experimental group engaged activities such as pre-class notes, interactive discussions, and active learning exercises, while the control group followed traditional teacher-centered instruction.

**Results:** At pre-test time, the mean scores and standard deviations for both experimental and control groups showed similar trends. However, after intervention, the post-test results showed significant differences in motivation levels between experimental and control groups. For example, while the post-test mean scores for control group ranged from 2.53 to 2.79; the mean scores for the experimental group ranged from 3.90 to 4.44. Moreover, MANOVA results revealed a significant main effect of TimePoint (F(1, 746) = 13.012, p = .000). Additionally, the study found that the approach had the most significant positive impact on Mathematics students, with notable improvements in items such as study planning (p = .021) and daily motivation (p = .021). However, the findings showed no relationship between TimePoint and gender, indicating that there are no significant motivational effects between males and females.

**Conclusion:** The studyrecommends that educationists in Tanzania should consider adopting the flipped classroom model in addressing learning challenges, demotivation among secondary school students in particular.

***Keywords:*** *Motivation, Flipping the classroom, secondary schools, self-directedness, autonomy, constructivist learning theory*

1. **INTRODUCTION**

Motivation plays a fundamental role in the learning process, igniting students’ desire to learn and influencing their overall educational experience. It is a key aspect that tends to foster students’ self-directedness, persistence, confidence, retention and active engagement in educational activities, all of which contribute to improved academic performance (Philemon & Mkulu, 2020; Ryan & Deci, 2020). Literature affirms that motivation, particularly, intrinsic motivation, plays a significant role in making learners willing to take responsibilities of their own learning (Ceylan, 2021; Khan & Younas, 2021; Shillingford & Karlin, 2013; Valerio, 2012). Studies further emphasizes that provision of conducive and motivating learning contexts, leads to improvement of students’ autonomous behavior, while promoting sustained and meaningful engagement in learning (Cents-Boonstra, 2020; Evans & Boucher, 2015; Saeed & Zyngier, 2012).

Motivation in learning is broadly categorized into two: intrinsic and extrinsic motivation, each playing a unique role in shaping students’ learning behaviors. Overall, motivation, whether intrinsic or extrinsic, plays a crucial role in molding students’ willingness to learn, influencing the effort they devote to their studies, their persistence in overcoming challenges, and their ability to control their learning strategies effectively (Cents-B`oonstra et al., 2020; Ryan & Deci, 2020). Furthermore, literature indicates that motivated students are more likely to adopt deep learning approaches rather than surface learning strategies, leading to better knowledge retention and critical thinking skills (Schunk & DiBenedetto, 2021).

There has been a global and regional emphasis on the need to prepare and motivate students to learn, as it has been recognized that motivation is one of the crucial factors for effective learning and skill acquisition (Kosovich, Hulleman & Barron, 2017; Maddens et al, 2023). This is because it is believed that a conducive and supportive learning environment plays a pivotal role in enhancing student motivation, whereas a non-conducive environment can lead to demotivation and demoralization. Research establishes that, with a positive and supportive learning atmosphere, there will be an increased student engagement and academic achievement. On the contrary, negative learning environments, that is characterized by discomfort and lack of support, can hinder motivation and learning outcomes (Firman & Sandiarsa, 2024; Fitria et al, 2023; Havidz & Mujakiah, 2023; Hafızoglu & Sundus Yerdelen, n.d).

Several international agencies for education and developmentunderscore the importance of nurturing motivation among secondary school students (OECD, 2018; UNESCO, 2015; UNICEF, 2019); particularly in developing countries, as they are disproportionately affected by challenging learning environments (United Nations, 2015; UNESCO, 2017; 2021). These challenges include inadequate learning resources (Barrett et al, 2019; World Bank, 2018; Zickafoose et al, 2024), overcrowded classrooms (Likuru & Mwila, 2022; Osai et al, 2022), poor teacher training and support (Osai et al, 2022; UNESCO, 2024), socioeconomic barriers (Dahlman & Mealy 2020; UNICEF, 2019), limited access to technology (Dahlman & Mealy 2020; ITU, 2022; Zickafoose et al, 2024), political instability and conflict (Save the Children, 2021; Salih, 2024; UNESCO, 2023), and gender disparities (UNESCO, 2017; Zickafoose et al, 2024). Each of these factors plays a critical role in shaping students’ ability to initiate, direct, and sustain interest in learning, eventually influencing their academic performance and long-term educational outcomes (Eccles & Wigfield, 2002).

As a developing country, Tanzania is not immune to these challenges, which accentuate the urgent need for strategies to foster student motivation and enhance learning engagement. Research indicates that many secondary schools in Tanzania struggle with poor teaching and learning environments, characterized by inadequate teaching and learning materials, overcrowded classrooms, limited professional development opportunities for teachers, and low teacher motivation (Izengo & Rupia, 2022; Likuru & Mwila, 2022; Lucumay & Matete, 2024). These challenges significantly impact students’ motivation levels; while a supportive and well-resourced learning environment enhances psychological comfort, fosters interest in learning, and strengthens students’ commitment to their studies (Godson & Ngussa, 2020; Kaizirege & Biswalo, 2023).

To address these challenges, several innovative pedagogical initiatives have been established and implemented across regions; and one of these approaches that address demotivation state among students has been flipping the classrooms (Agyeman & Aphane, 2024; Xiu & Thompson, 2020). Flipped classrooms have emerged as an effective pedagogical approach for addressing various challenges faced by secondary school students, particularly those related to motivation issues. Studies assert that shifting direct instruction outside the classroom while utilizing in-class time for active learning, collaboration, and problem solving enhances students’ motivation, making them more engaged in their learning (Campillo-Ferrer & Miralles-Martínez, 2021; Chou, Chen & Hung, 2021; Xiu & Thompson, 2020). Research further designates that flipped learning improves students’ motivation, as the approach enhances student autonomy, fosters deeper cognitive engagement; allowing students to learn at their own pace while receiving more interactive and personalized support during in-class sessions (Anjass, Hamed & Aguaded-Ramírez, 2025; Lamsyah, El Bouazzaoui & Kanjaa, 2022; Zheng et al, 2020). In addition, the flipped classroom approaches enhance students’ intrinsic motivation, igniting a sense of responsibility and self-efficacy, and encouraging them to take an active role in their learning process (Chen et al., 2017; Hew & Lo, 2018).

**1.1 THE PROBLEM**

This study emerged from the rising recognition of the dire need to enhance students’ motivation, given its vital role in the learning process (Philemon & Mkulu, 2020; Ryan & Deci, 2020). Furthermore, it is a response to the persistent challenges faced by many secondary schools across developing countries, particularly in Tanzania (Godson & Ngussa, 2020; Kaizirege & Biswalo, 2023). Identifying the increasing potential of flipped classroom approaches as a solution to various learning challenges, including low motivation levels among students (Campillo-Ferrer & Miralles-Martínez, 2021; Chou, Chen & Hung, 2021; Xiu & Thompson, 2020), a feasibility study was conducted by Nyandara & Jonas (In Press) to assess teachers’ and students’ awareness of this approach in three regions of Tanzania.

Initially, the findings revealed that both teachers and students had limited understanding about the role played by flipped classroom approaches. Nevertheless, as they gained more insights, they expressed growing interest and curiosity about its potential benefits; although, some students, particularly those studying Mathematics, expressed uncertainty regarding the approach’s effectiveness in certain subjects. This indicated that while the flipped classroom model holds potential promises regarding teaching and learning processes, its impact appears to be questioned across different populations and contexts. In light of these findings, there arose a need for follow-up studies from different perspectives. Therefore, this study aimed to explore the effectiveness of the flipped classroom approach in enhancing students’ motivation in Tanzanian secondary schools, as literature identifies motivation as a crucial factor in student learning. Specifically, this study aimed at addressing this question: “*To what extent does the flipped classroom approach affect the motivation of secondary school students in Tanzania?*”

**1.2 THEORETICAL FRAMEWORK**

This study is grounded in Constructivist Learning Theory (CLT), which originates from the works of Jean Piaget and Lev Vygotsky. The theory postulates that learners actively construct their own knowledge through interaction with their environment, whether that be the content, their peers, or their guardians who are knowledgeable than themselves. This theory focuses on the basis that learners are not passive recipients of information, rather, they are to be considered as active participants in the learning process, engaging them in activities that help them make sense of the world and retain knowledge more effectively. This theory highlights the importance of creating learning environments that encourage learners to explore, ask questions, and apply their understanding in real-world contexts.

In this sense, CLT was considered relevant to guide this study because in flipped classrooms, learners are responsible for their initial learning outside the classroom. Learners are being provided with pre-class materials such as videos, digital or printed notes, or recorded lectures, which provide ample room for them to explore their learning contexts, hence, taking an active role in their own learning. This pre-class engagement allows students to create foundational knowledge at their own pace, empowering them with a sense of autonomy, which is a key element in constructivist learning.

In the in-class session, the focus shifts from passive listening from the teacher (teacher-centeredness) to active engagement (learner-centeredness), which is fundamental for constructivist pedagogical approach. Learners are presented with opportunities to apply the knowledge they gained during pre-class moment through collaborative activities, discussions, and problem-solving tasks. In this context, the teacher’s role changes to that of a facilitator or guide, offering a platform to support the learners’ learning process. By working with peers and receiving immediate feedback, students are motivated to hone their understanding and gain confidence in their abilities. According to CLT learners’ motivation is profound when they are actively involved in constructing meaning from their experiences, rather than passively receiving information (Ormrod, 2009; Schunk, 2012); the features that are reflected in the flipped classrooms. Therefore, the principles of CLT provide a robust framework for understanding how flipped classrooms can influence students’ motivation, through active knowledge construction, peer collaboration, and teacher scaffolding, which enhance students’ intrinsic motivation. Below is a pictorial representation a Figure 1.

**FIGURE 1. PICTORIAL FRAMEWORK**

**INDEPENDENT:**

**PRINCIPLES OF FLIPPED CLASSROOM MODEL**

**PRE-CLASS ACTIVITIES:**

* AUTONOMOUS
* SELF-DIRECTEDNESS

**IN-CLASS ACTIVITIES:**

* INTERACTION
* COLLABORATION
* IMMIDIATE FEEDBACK

**DEPENDENT:**

* GAIN CONFIDENCE
* ACTIVE PARTICIPATION
* MOTIVATED IN LEARNING

**2 EXPERIMENTAL Methodology:**

This study was conducted in two secondary schools, School “A” from Ilala Municipality and Schools “B” from Ubungo Municipality; involving Form One and Form Three students. It was an experimental study, where eight classes were divided into two groups, experimental and control groups. The study involved three subjects, where English, represented Language subjects; Geography, represented Arts subjects; and Mathematics, represent Science and Mathematics Stream. Referring to Nyandara and Jonas (In Press), Mathematics was purposely included in this study as students exhibited uncertainty behavior with the effectiveness of the flipped classroom approaches in this subject.

At School “A”, Form One English and Form Three Geography classes were studied; while at School “B”, the researcher used Form One English and Form Three Mathematics classes as case studies. The study was carried out within two months; whereby, the experimental group was exposed to activities such as pre-class lesson notes, interactive discussions, and active learning exercises during class time; while the control groups followed the traditional teacher-centered approach, with direct instruction in the classroom.

To evaluate the impact of the flipped classroom approaches on students’ motivation, the two groups, were subjected to pre- and post-tests using a combination of open- and closed-ended questionnaires, which were conducted twice, once at the beginning and again towards the end of the intervention period. The purpose of pre-testing for both groups was to establish a baseline of their initial performance and to provide a basis for comparison after the intervention; while, the post-testing aimed to determine whether there was any improvement in students’ motivation after the intervention. The questionnaire employed a 5-point Likert scale with eight statements, namely, I enjoy learning more when given lesson notes; I plan my study time at home every day; I am happy that I get better grades in tests and exams; I am happy that I can answer questions in class; When I miss a class, I feel left out and disadvantaged; When I encounter a difficult topic, I review it repeatedly until I understand; The notes we are given motivate me to study daily; and The teaching methods used by the teacher motivate me to learn more.

Collected data were subjected to various statistical methods; descriptive analysis was conducted to compute means and standard deviations for pre- and post-tests for control and experimental groups, for the purpose of establishing participants’ initial perceptions; and allow for comparison of the findings after the intervention. Another data analysis method that was used was Multiple ANOVA, which was employed in order to simultaneously analyze multiple dependent variables, to establish the interrelationships between the variables, and increase statistical power; as it involved several aspects such as gender, group, school, class, and time. On the other hand, qualitative data were analyzed using Content Analysis method, so as to systematically organize and categorize data, identifying patterns, themes, and trends.

**3. RESULT AND DISCUSSION**

This section presents the findings and discussion of the study which examined the impact of flipped classroom approach on students’ motivation. As identified above, students in eight groups from two secondary schools were divided into two; experimental and control groups; where they were assessed before and after the intervention using eight test items. Descriptive analysis was performed to compute the mean scores and standard deviations for each group at both times of data collection. The goal was to identify any significant changes in students’ motivation as a result of the intervention, and to compare these changes between the experimental and control groups. The summary of descriptive Analysis has been summarized in Table 1. Below:

**Table 1. Descriptive Analysis Results**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Items** | **Scores for Control Group** | | | | **Scores for Experimental Group** | | | |
| **Pre-test** | | **Post-test** | | **Pre-test** | | **Post-test** | |
| **Mean** | **STD** | **Mean** | **STD** | **Mean** | **STD** | **Mean** | **STD** |
| I enjoy learning more when given lesson notes. | 2.63 | .729 | 2.63 | .714 | 2.67 | .678 | 4.28 | .759 |
| I plan my study time at home every day. | 2.66 | .724 | 2.50 | .734 | 2.64 | .712 | 3.99 | .766 |
| I am happy that I get better grades in tests and exams. | 2.40 | .731 | 2.42 | .727 | 2.73 | .696 | 4.07 | .768 |
| I am happy that I can answer questions in class. | 2.44 | .730 | 2.46 | .704 | 2.79 | .718 | 4.22 | .745 |
| When I miss a class, I feel left out and disadvantaged. | 2.46 | .725 | 2.41 | .722 | 2.62 | .688 | 4.40 | .762 |
| When I encounter a difficult topic, I review it repeatedly until I understand. | 2.75 | .732 | 2.48 | .756 | 2.53 | .723 | 3.90 | .732 |
| The notes we are given motivate me to study daily. | 2.38 | .721 | 2.38 | .708 | 2.74 | .686 | 4.14 | .712 |
| The teaching methods used by the teacher motivate me to learn more. | 2.51 | .723 | 2.33 | .749 | 2.73 | .721 | 4.44 | .699 |

The pre-test and post-test results revealed distinct differences in the motivational factors between the two groups. The pre-test mean scores for the experimental group, which received the intervention, ranged from 2.53, for item 6 to 2.79 for item 4; with the standard deviations ranging between 0.678 for item 1 to 0.723 for item 6. On the hand, the pre-tests mean scores for control group, which did not receive any treatment ranged from 2.40 for item 3, to 2.75 for item 6, with standard deviations ranging from 0.721 for item 7 to 0.732 for item 6.

These scores provide valuable insights into the motivation levels and variability of the responses for both the experimental and control groups. Looking at their mean scores, they show that before the intervention, both groups displayed modest levels of motivation. Even the standard deviations for both groups were quite similar, suggesting that there was no unwarranted inconsistency in responses, with enough variation to show that some differences in motivation existed among participants. These similarities in mean scores and standard deviations establish that the two groups were adequately similar during the pre-testing stage, providing a solid foundation for assessing the intervention effects.

However, after the intervention, there have been some significant changes. For example, while the mean scores for post-test of the control group were almost similar, with slight changes than their pre-test scores measuring between 2.38 for item 7 and 2.63 for item 1 respectively; with standard deviation ranging from 0.704 to 0.756; the post-test scores for the experimental group showed significant improvements; measurements varying between 3.90 for item 6 and 4.44 for item 8; with standard deviations ranging between 0.699 and 0.768. These results indicated that while there have been no notable changes in mean scores and standard deviations for the group with no treatment, the treatment group showed significant changes in these measurements. This dramatic gain in scores for the experimental group suggests that the flipped classroom approach significantly improved students’ motivation to learn compared to the traditional teaching methods. Not only that, the rather comparable standard deviations for both experimental and control groups indicate consistent responses across the participants, which points out the effect of the strategy in improving students’ motivation. These positive impacts suggest that flipped classroom approaches had significant impacts on motivation levels among secondary school students.

These findings are consistent with the studies by Chou, Chen and Hung (2021); Liu and Mohamed (2023); and Sookoo-Sing and Boisselle (n.d), whose studies discovered that integration of flipped classroom model in teaching and learning, effectively enhance students’ learning experience, fostering a sense of motivation. Not only that this experience also was observed by Naciri et al (2022); and Xiu and Thompson (2020) whose findings suggest that the motivation scores of all students were positively improved in the flipped classroom compared to the traditional method. This could be a result of a fact that this pedagogy was new to students and hence, they got excited with the new experience in their learning as per Qureshi & Jamil (2023), who claimed that teachers’ use of new and innovative teaching methods can excite and motivate students in the learning process as these innovative methods tend to foster active student engagement in the learning process.

Besides the results of the descriptive analysis already mentioned, data were also tested using Multivariate Analysis of Variance (MANOVA). This procedure was deemed necessary for this study as it involved analyzing multiple dependent variables, namely, gender, group, time, class, and subjects simultaneously. This approach allowed the researcher to examine whether the independent variable had an overall effect on the combination of these dependent variables, rather than assessing each one separately. The Summary of the Analysis has been captured in Table 2. Below:

**Table 2. Multivariate Analysis of Variance (MANOVA) Test**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Effect | **Value** | **F** | **Hypothesis df** | **Error df** | **Sig.** | **Partial Eta Squared** | **Observed Powerc** |
| TimePoint | .017 | 13.012b | 1.000 | 746.000 | .000 | .017 | .950 |
| TimePoint \* Gender | .004 | 3.098b | 1.000 | 746.000 | .079 | .004 | .420 |
| TimePoint \* Class | .218 | 208.183b | 1.000 | 746.000 | .000 | .218 | 1.000 |
| TimePoint \* Group | .042 | 32.781b | 1.000 | 746.000 | .000 | .042 | 1.000 |
| TimePoint \* School | .005 | 3.925b | 1.000 | 746.000 | .048 | .005 | .508 |
| TimePoint \* Gender \* Class | .000 | .006b | 1.000 | 746.000 | .936 | .000 | .051 |
| TimePoint \* Gender \* Group | .003 | 2.504b | 1.000 | 746.000 | .114 | .003 | .352 |
| TimePoint \* Gender \* School | .001 | .913b | 1.000 | 746.000 | .340 | .001 | .159 |
| TimePoint \* Group \* School | .008 | 5.906b | 1.000 | 746.000 | .015 | .008 | .680 |
| TimePoint \* Gender \* Group \* School | .000 | .055b | 1.000 | 746.000 | .815 | .000 | .056 |

The analysis revealed a significant main effect of TimePoint, indicating notable differences between pre-test and post-test scores. The multivariate tests, including Pillai's Trace, Wilks’ Lambda, Hotelling’s Trace, and Roy's Largest Root, all yielded consistent results: F(1, 746) = 13.012, p = .000, Partial Eta Squared = .017. The partial eta squared value of .017 suggests a small effect size, indicating that while the effect of TimePoint is statistically significant, its practical impact on students’ motivation is relatively modest. One possible explanation that suggests the reason for a small effect size could be the duration of the intervention, which lasted approximately two months. Research suggests that the effectiveness of any educational interventions, particularly those involving pedagogical shifts like the flipped classroom, is often influenced by the amount of time students have to adapt to new learning approaches and instructional strategies. Studies by Van Alten et al. (2019) emphasize that the flipped classroom model requires an adjustment period for both students and teachers, and short-term interventions may not fully capture its long-term benefits. Similarly, Freeman et al. (2014) argue that active learning approaches, including flipped classrooms, yield stronger effects when implemented over extended periods, allowing students to fully assimilate into new learning habits.

Again, the statistical analysis between pre-test and post-test scores across classes that were involved in the intervention indicated significant differences between experimental and control groups, as indicated by: Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root: showing F(1, 746) = 208.183, p = .000, Partial Eta Squared = .218. According to these scores, there is a significant interaction between TimePoint (pre- and post-test) and class, suggesting that the changes in student motivation from pre-test to post-test differed significantly across different class levels. The partial eta squared value of .218 indicates a large effect size, demonstrating that the intervention had a meaningful impact on student motivation across classes.

In addition, the researcher sought to explore the impact of the intervention on different subject areas. The goal was to see how the flipped classroom approach influenced students’ motivation across different subjects that were involved in the study, namely, English, Geography, and Mathematics. The emphasis was to find out if there were any significant differences in motivation levels among these subjects. After carrying out a Mixed ANOVA, which allowed the researcher to compare the effects of the flipped classroom approaches across the different subjects, the findings revealed a notable interaction between the subjects, with Mathematics showing the most positive impact. It was realized that students in Mathematics consistently reported significant improvements in motivation-related aspects compared to those in English and Geography. Specifically, Mathematics students in the experimental group exhibited higher mean differences in items such as item 2, “I plan my study time at home every day”; which scored p =.021; and item 7, “The notes we are given motivate me to study daily”; scoring p =.021; compared to their peers in English and Geography. This suggests that the flipped learning model effectively aligns with the logical, structured nature of Mathematics, fostering greater engagement and motivation. Conversely, English and Geography showed comparatively smaller changes, which might indicate differences in subject-specific teaching dynamics or student engagement levels.

These findings are in line with several studies conducted overtime, such as Fernández-Martín et al (2020); and Wijanarko & Ganeswara (2021) whose results indicated that integration of flipped classroom approach in teaching of mathematics influences students’ motivation in learning, particularly in such aspects as students’ autonomy, and self-regulation towards learning. However, these results are contrary to the results that were observed in a feasibility study by Nyandara and Jonas (In Press), whereas respondents showed uncertainty regarding the impact of the flipped classrooms on students’ motivation in learning Mathematics.

However, the MANOVA analysis that was performed to examine the effect of the intervention on gender showed no significant effects. The results, as indicated by Pillai’s Trace, Wilks’ Lambda, Hotelling’s Trace, and Roy’s Largest Root, showed no significant differences in the changes from pre-test to post-test scores in terms of motivation between males and females, as shown by the scores: F(1, 746) = 3.098, p = .079. This proposes that the flipped classroom approach has no motivational impacts across gender, meaning that both males and females are affected equally. These findings are contrary to what was observed by Ferriz-Valero et al (2022), whose findings showed that there were some certain differences that were exhibited in terms of students’ motivation related to gender, where boys seemed to develop autonomous motivation more than girls.

Even so, as established earlier in the methodology part, elements of qualitative measures were part of this study, as data were collected using a questionnaire that had both closed- and open-ended questions. Statistical information from closed-ended questions have already been analyzed using different analysis methods and have already been compiled. Data from the open-ended questions were designed to capture students’ motivational views on the benefits they gained from the flipped learning intervention, as well as their perceptions of the potential of this approach. Students were asked to respond from two different questions, namely, “*what benefits have you gained from being given lesson notes before the class*? *Please specify them*”; and the second one was “*what are your opinions on learning by being given lesson notes in advance* *before the class session*?” The responses to these questions, particularly from experimental group indicated that students appreciated the new teaching approach introduced by their teachers.

Some of the selected responses to the first question which wanted students to tell about the benefits that they have gained from being given lesson notes before the class have been recorded: One among the responses from Form I English class from School “A” had this to say *“…being provided with notes before the class gives me the enthusiasm to learn all the time …”.* Another Form III Geography student from the same school, added, *“…Since our teacher started giving us notes before class, it has given me the desire to learn and also meets my learning needs …”.* Not only that, cementing on what has been gathered from the same class, another fellow student added that “…*the style that the teacher has started using, has helped me participate more in classroom activities and improved communication between me and the teacher*…”. Akin responses were gathered from School “B” where a Form III Mathematics student shared her experience that, *“…since our teacher started using this new approach, it has helped me answer questions carefully and confidently because I have the notes before the lesson …”.* In addition to this, another Form I English student, expressed his happiness regarding the use of this technique as he said, *“…I learn happily when the teacher enters the classroom as I am aware of what is going to discuss with us…”.* On top of that, another Form I English student wished for his teachers to continue teaching using this method as he stressed that “… *I wish this method which is currently being used by our teachers will continue as it enables us as students to be confident in class without fear…*”.

Concerning the second question, which sought to capture students’ opinions on this innovative pedagogical approach, students shown positive feelings toward this new learning approach. For instance, a Form I English student from School “B” stated that *“…I prefer that the method should be continually being used even by other teachers because the method has helped me a lot because I study by myself at home and when I don’t understand, the teacher helps me in class...”.* Another Form I English student from the same school echoed this sentiment, saying, *“…Let’s continue receiving notes before the lessons so that when the teacher comes to teach, we will be aligned and understand better …”.* While a Form III Mathematics student from the same School “B” added that *“…Teachers should continue giving us notes like this so we can strengthen our minds before being taught…*”.

Similarly, a Form III Geography student from School “A” highlighted the interactive benefits of this approach, stating, *“…My opinion is that if possible, this programme of providing notes before the lesson should continue because it helps us students as it builds quick understanding before the teacher teaches us …”.* Another student, a Form I English student from the same school argued that all teachers should adopt this method, he emphasized that, *“…Teachers should work harder to provide us with notes before lessons because for me, I feel it helps reduce ignorance and increases my knowledge, learning, and understanding quickly about the subjects being taught in class …”.* Overall, from these findings, students expressed strong favor for the flipped learning approach, emphasizing its role in enhancing their motivation in their studies.

As CLT suggests, these results are in line with the theory’s focus that once learners are exposed to supportive and interactive learning environment, they tend to take active and responsive roles in their learning, instead of being passive recipients of information. As per the focus of this theory, the practice in the flipped classrooms emphasis on the importance of creating learning environments that encourage learners to explore, ask questions, and apply their understanding in real-world contexts. Hence, creating the contexts that influence students’ motivation, through active knowledge construction, peer collaboration, and teacher scaffolding, which enhance students’ intrinsic motivation.

**Conclusion and Recommendations**

In conclusion, the findings of this study confirm that the flipped classroom approach significantly enhances secondary school students’ motivation, as evidenced by the experimental group’s marked improvement in post-test scores compared to pre-test results. Notably, Mathematics students demonstrated the most substantial gains, particularly in areas such as study planning, self-directed learning, and sustained daily motivation. These outcomes underscore the flipped classroom’s potential to transform traditional pedagogy, especially in subjects requiring logical reasoning and structured problem-solving, like Mathematics. Based on these results, it is recommended that Tanzanian educators should actively integrate the flipped classroom model, particularly in Science, where structured, self-paced learning is critical. Schools should monitor student engagement and tailor flipped content to address diverse learning paces, ensuring no learner is left behind.

**Disclaimer (Artificial intelligence)**

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Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1. I used ChatGPT and COPILOT to ask for guidance in performing some statistics like MANOVA; of which to some extent some of the areas were not clear to me. But later on I proceed with writing on my own.

2.

3.

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