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**ASSESSMENT OF THE POTENCY OF FLIPPED CLASSROOMS AS A CORRELATE  
OF STUDENT CENTRED LEARNING: A CASE STUDY OF SECONDARY SCHOOL  
STUDENT IN UYO LOCAL GOVERNMENT AREA**

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**ABSTRACT**

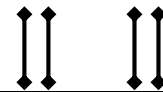
*This study examined the potency of the flipped classroom model as a correlate of student-centred learning, emphasizing how its structure promotes autonomy, active participation and deeper comprehension. Descriptive survey design was adopted for this study. The study was carried out in Uyo Metropolis, Akwa Ibom State, Nigeria. The targeted population consist of all students and teachers in selected secondary and tertiary institutions within Uyo Metropolis. A simple random sampling technique was employed to select 30 students and 10 teachers from each of the 5 selected institutions in Uyo Metropolis. This gave a total sample size of 200 respondents. Data were collected using a structured questionnaire titled “Flipped Classroom and Student-Centred Learning Questionnaire” (FCSCLO). Face and content validation of the instrument was carried out by an expert in Test, Measurement, and Evaluation to ensure its accuracy, appropriateness, and completeness for the study. The reliability coefficient obtained was 0.86, which was considered sufficiently high to justify the use of the instrument. The data generated for this study were analyzed using appropriate statistical techniques, including descriptive statistics to answer the research questions and regression analysis to test the hypothesis. The study concluded that by shifting foundational content delivery to out-of-class settings and using classroom time for active engagement, the flipped approach fosters autonomy, collaboration and deeper understanding among students. One of the recommendation made was that learners should be encouraged to take responsibility for pre-class preparation, as consistent engagement with pre-class materials is essential for meaningful participation and the success of the student-centred flipped model.*

**KEYWORDS: Flipped Classrooms, Student Centred Learning, Secondary School Student,  
Uyo Local Government Area.**

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**INTRODUCTION**

The shift from teacher-dominated pedagogy to more active, student-centred learning models has transformed contemporary educational practice. One instructional innovation that

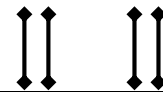


aligns strongly with this paradigm is the flipped classroom model, where students first engage with instructional content outside the classroom and spend class time participating in collaborative and problem-solving activities. This approach contrasts with traditional lecture-based methods and is increasingly recognized for its potential to promote deeper understanding, autonomy, and active learning. According to Bishop and Verleger (2019), the flipped model supports student-centred learning because it repositions learners as active participants rather than passive recipients of knowledge. The potency of flipped classrooms lies in their ability to create flexible learning environments that respond to individual student needs. By allowing students to learn foundational content at their own pace usually through videos, readings, or multimedia resources—the flipped approach accommodates diverse learning styles and abilities. This flexibility enhances student engagement and ownership of learning, which are central principles of student-centred pedagogy. As Abubakar and Musa (2021) note, self-paced pre-class learning empowers students to arrive in class better prepared to participate meaningfully in interactive activities that reinforce critical thinking and knowledge application.

The flipped classroom fosters collaborative and participatory learning experiences that strengthen the connection between instructional design and student-centred outcomes. In-class sessions typically involve discussions, group tasks, case studies, or problem-based learning, all of which contribute to a richer and more interactive learning environment. Research by Lo and Hew (2020) demonstrates that flipped instruction enhances peer interaction, student motivation, and cooperative learning—key indicators of effective student-centred instruction. By repositioning classroom time for active learning, the flipped model becomes a powerful tool for cultivating learner agency and engagement. The integration of digital technologies in flipped classrooms also enhances their potency as a correlate of student-centred learning. Digital platforms enable access to diverse instructional resources, facilitate continuous assessment, and support feedback loops that help students monitor their progress. These technologies also expand opportunities for personalization, as teachers can track student performance and adjust instructional strategies accordingly. According to McLaughlin and Rhoney (2022), technology-enabled flipped learning environments encourage students to take responsibility for their learning, which is a defining feature of student-centred education. Given these dynamics, assessing the potency of flipped classrooms as a correlate of student-centred learning is critical for understanding how this instructional model contributes to educational effectiveness. As educational systems advocate for pedagogical reforms that promote autonomy, collaboration, and learner engagement, the flipped classroom stands out as a pedagogical innovation worthy of rigorous evaluation. A comprehensive assessment will help determine the extent to which flipped instruction aligns with student-centred principles and how it can be optimized to enhance learning outcomes. Consequently, this study seeks to contribute to the growing body of literature by examining how flipped classrooms support student-centred learning and the factors that influence their effectiveness.

### **Statement of problem**

The rising desire for new pedagogical approaches in secondary education has highlighted the implementation of flipped classrooms as a tool to foster student-centered learning. Notwithstanding the increasing recognition of this pedagogical technique, numerous secondary schools in Uyo Local Government Area continue to depend predominantly on the conventional teacher-centered method, wherein students assume passive roles throughout classroom instruction. This circumstance has persistently impacted students' engagement, analytical reasoning,



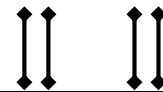
teamwork, and autonomous learning capabilities. Despite the belief that flipped classrooms promote active engagement by enabling students to review instructional materials prior to class and engage in interactive activities during class, uncertainty persists regarding their actual effectiveness and applicability in the secondary school context within the study area. Moreover, insufficient technological resources, inadequate internet connectivity, limited instructor proficiency in digital pedagogy, and students' diverse attitudes towards technology-enhanced learning may impede the effective execution of flipped classrooms. It is against this background that this study seeks to assess the potency of flipped classrooms as a correlate of student-centred learning among secondary school students in Uyo Local Government Area. This study aims to evaluate the effectiveness of flipped classrooms as a factor in student-centered learning among secondary school students in Uyo Local Government Area.

### **Concept of Classroom**

The concept of the classroom has evolved beyond the traditional understanding of a physical space where teaching and learning occur. In contemporary education, a classroom is viewed as a dynamic and interactive environment that supports cognitive, social, and emotional development. According to Parker and Boyd (2020), a classroom is no longer defined by four walls but by the learning experiences, interactions, and instructional methods that shape students' engagement. This shift reflects the global transition toward learner-centered and technologically supported educational models. The idea of a modern classroom is to create an environment that encourages participation and teamwork. As explained by Nwafor and Igwe (2021), classrooms today emphasize group activities, shared problem-solving, and peer-to-peer communication, which help students construct knowledge rather than merely receive it. As a result, the classroom turns into a social system where teachers and students constantly engage, fostering a community of inquiry and collaborative learning.

Additionally, the classroom has evolved into a technologically advanced setting. These days, digital resources like learning management systems, iPads, projectors, and virtual collaboration platforms are crucial in determining how students interact in the classroom. According to Ibrahim and Musa (2022), technology-enhanced classrooms improve accessibility to information, diversify instructional approaches, and allow teachers to personalize learning experiences based on students' needs. Students' motivation and academic performance are improved by this integration of digital resources, which also enables differentiated instruction. The classroom concept's significance in fostering emotional health and diversity is another important aspect. According to recent studies, schools need to accommodate a wide range of students, including those with special needs, language difficulties, and different sociocultural origins. As argued by Eze and Okafor (2023), an inclusive classroom promotes fairness, respect, and participation for all students, ensuring that no learner is marginalized. This viewpoint emphasizes the significance of teaching methods that respect diversity and establish secure, encouraging learning environments.

Critical life skills like problem-solving, creativity, teamwork, and communication can also be developed in the classroom. These abilities are necessary for learning in the twenty-first century. In a study by Rahman and Bello (2021), classrooms that adopt inquiry-based learning and project-based activities significantly enhance students' ability to think critically and apply knowledge to real-world situations. Therefore, the classroom is not merely a venue for academic



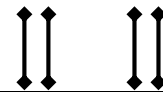
instruction but a place where holistic development is nurtured. Lastly, the idea of the classroom has been broadened in the post-pandemic age to encompass virtual and hybrid learning environments. Meaningful education can take place outside of traditional locations, as the COVID-19 shift to remote learning proved. According to Johnson and Adeoye (2020), virtual classrooms provide flexibility, broaden access to education, and support continuity of learning during disruptions. As a result, the classroom is now conceptualized as both a physical and digital learning ecosystem.

### **Concept of Flipped Classrooms**

The flipped classroom is defined as an instructional model in which direct teaching is shifted from the classroom to the individual learning space, while classroom time is transformed into an active, student-centered environment. According to Chen and Hou (2020), a flipped classroom is a pedagogical approach where students first encounter new content outside class—usually through videos, digital modules, or readings—and then use class time to apply, analyse, and extend that knowledge through guided activities. This definition highlights the fundamental idea of reversing the traditional teaching sequence, enabling students to learn foundational concepts at their own pace while using class sessions for higher-order learning.

Conceptually, the flipped classroom is based on student-centered and constructivist theories that encourage deeper comprehension and active participation. As explained by Al Mamun and Azad (2021), the concept emphasizes learner autonomy because students take responsibility for engaging with the pre-class material before participating in interactive tasks during class. By encouraging students to ask questions, work together with peers, and solve issues, this framework changes the teacher's function from imparting knowledge to facilitating learning. Another important concept behind flipped classrooms is flexibility in learning. Lim and Wang (2022) argue that flipping instruction allows students to control when, where, and how they study new content, making learning more adaptable to individual differences. This adaptability improves self-control, drive, and readiness—all crucial aspects of learning in the twenty-first century. Teachers can go straight into more in-depth research and real-world applications when pupils are already familiar with the subject.

The contemporary idea of flipped classrooms is also influenced by technology. Formative assessment and content delivery are supported by digital resources, including interactive tests, video tutorials, and learning management systems. As these digital systems advance, the structural planning behind them is shifting toward data-driven, intelligent automation; modern curriculum framework discussions emphasize that adopting Artificial Intelligence (AI) can optimize instructional design by tracking students' learning trends, uncovering performance gaps, and building highly adaptable learning pathways tailored to 21st-century workforce demands (King & Eduok, 2026). While AI tools significantly enrich modern instructional delivery, their long-term efficacy relies heavily on providing specialized digital pedagogy training for instructors and ensuring adequate physical technological infrastructure within secondary schools to prevent implementation gaps (Eduok et al., 2025). According to Zhao and Lai (2023), technology not only enables the distribution of instructional content but also allows teachers to track students' progress and design data-informed classroom activities. This makes the flipped model an innovative and technology-driven approach to teaching. Furthermore, the flipped classroom is conceptually tied to active and collaborative learning. Hassan and Mohammed (2020) emphasize that class time in



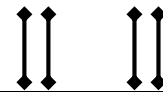
a flipped setting is primarily used for group discussions, peer instruction, and problem-solving activities that develop critical thinking and communication skills. This emphasis on student involvement is consistent with modern educational objectives that priorities in-depth learning over rote memorization.

### **Concept of Students Centered Learning**

Student-centred learning (SCL) refers to an instructional approach in which learners are active participants in constructing knowledge, rather than passive recipients of information. It emphasizes learners' needs, interests, abilities, and responsibilities in the learning process. According to Parker and Boyd (2020), student-centred learning is defined as a pedagogical method that shifts the focus from teacher-led instruction to activities that promote student autonomy, engagement, and self-direction. This definition emphasizes the fundamental notion that students are in charge of organizing, directing, and assessing their own educational experiences.

Constructivist theory, which holds that students develop their own understanding by active engagement, serves as the conceptual foundation for student-centred learning. As explained by Nwafor and Igwe (2021), the concept promotes learning environments where students explore, question, collaborate, and apply knowledge rather than simply memorizing content. This method acknowledges that critical thinking and comprehension are strengthened when students engage with concepts, peers, and real-world situations. Learner autonomy is another essential idea in student-centered learning. Giving students more influence over their learning assignments boosts their motivation and sense of ownership, according to research. According to Lim and Wang (2022), student-centered environments encourage self-regulated learning skills such as planning, goal-setting, monitoring progress, and reflecting on outcomes. These abilities help students adjust to various academic and professional settings and equip them for lifetime learning. Another key component of the idea is collaboration. Through group discussions, collaboration, and cooperative problem-solving, student-centred learning fosters peer contact. Al-Mamun and Azad (2021) argue that collaborative activities create supportive learning communities where students share ideas, challenge perspectives, and develop communication abilities. This is consistent with 21st-century capabilities that emphasize interpersonal skills, creativity, and critical thinking.

Differentiated instruction is also incorporated into student-centred learning to address a range of learning requirements. Instructors modify exercises, resources, and tests to take into account the diverse backgrounds, skills, and learning preferences of their students. According to Eze and Okafor (2023), differentiation in student-centred settings ensures equity and inclusion by providing multiple pathways for learners to engage with content and demonstrate understanding. This makes the classroom more responsive to individual differences. Additionally, the idea of student-centred learning is strengthened by technology. Personalized learning, interactive exercises, online teamwork, and ongoing evaluation are all made possible by digital tools. Zhao and Lai (2023) note that technology-enhanced platforms allow students to access resources anytime, explore concepts through multimedia, and receive instant feedback, which increases engagement and deepens learning. Personalized learning pathways constitute the most significant role of Big Data in promoting motivational teaching strategies, allowing educators to craft individualized and data-driven instructional approaches that align with pupils' learning patterns, strengths, and weaknesses (Eduok et al., 2026).



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## **The Potency of Flipped Classrooms**

### ➤ **Enhances Student Engagement**

The flipped classroom actively involves students in the learning process by shifting the passive lecture content to pre-class activities, such as watching videos or reading materials. This approach allows classroom time to be dedicated to interactive discussions, problem-solving, and hands-on activities. By engaging students in higher-order thinking tasks during class, they are more likely to participate actively, ask questions, and develop a deeper understanding of the subject matter

### ➤ **Promotes Self-Paced Learning**

Students can access pre-recorded lectures, readings, or tutorials at their own pace, allowing them to revisit difficult concepts and learn at a speed suited to their individual needs. This flexibility accommodates different learning styles and helps reduce anxiety among students who may struggle with real-time lectures. The ability to control their learning pace has been shown to improve comprehension and retention (Rutkiene & Kacar, 2022).

### ➤ **Encourages Active Learning**

By focusing classroom time on exercises, discussions, and collaborative projects, the flipped classroom model encourages active participation rather than passive listening. Students develop critical thinking, problem-solving, and communication skills as they apply concepts in real-world contexts. Active learning in flipped classrooms has been linked to higher academic performance and better knowledge retention compared to traditional teaching methods.

### ➤ **Facilitates Immediate Feedback**

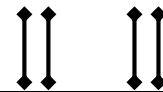
During class, instructors are able to monitor students' progress in real-time, address misconceptions, and provide immediate feedback. This prompt intervention helps prevent the accumulation of misunderstandings and enhances overall learning efficiency. Studies indicate that timely feedback in active learning settings significantly improves student confidence and learning outcomes.

### ➤ **Supports Collaborative Learning**

Flipped classrooms provide ample opportunities for students to work together on projects, case studies, and problem-solving tasks. Collaboration fosters peer-to-peer learning, where students can explain concepts to each other and build social and cognitive skills simultaneously. This cooperative environment strengthens understanding and encourages the development of interpersonal skills essential for future careers.

### ➤ **improves Academic Performance**

Empirical studies have shown that students in flipped classrooms often outperform their peers in traditional settings, particularly in comprehension, application, and analytical tasks. By promoting engagement, active learning, and immediate feedback, the model helps students internalize knowledge more effectively. Performance gains are especially notable in STEM subjects where problem-solving and conceptual understanding are critical (Bergmann, 2017).



➤ **Encourages Lifelong Learning Skills**

The flipped classroom fosters autonomy, self-discipline, and responsibility, as students must prepare for class in advance and manage their own learning. These skills extend beyond academic life and help cultivate a mindset geared toward lifelong learning. Research highlights that students in flipped classrooms demonstrate higher self-directed learning motivation, which is essential in today's rapidly changing knowledge-based world.

**The Features of Flipped Classrooms**

The flipped classroom is a teaching model where students learn basic content before class and use class time for deeper activities. It shifts the classroom from teacher-centered lectures to active, student-centered learning. This approach enhances engagement, flexibility, and understanding through technology-supported preparation.

➤ **Pre-Class Content Delivery**

In a flipped classroom, students first encounter new content before class, usually through videos, readings, podcasts, or interactive modules. This shifts the basic instruction from the classroom to the home environment, allowing students to absorb foundational knowledge at their own pace. Because students come to class already familiar with the topic, they are better prepared to participate actively, ask informed questions, and engage in deeper learning during class sessions.

➤ **Active, Student-Centered Classroom Time**

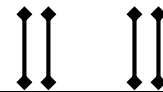
Instead of lecturing, class time in a flipped model is used for active learning—activities such as discussions, case studies, group work, problem-solving, and hands-on tasks. This feature transforms the classroom into an interactive learning space where students apply what they learned before class. With the teacher acting as a facilitator, students are encouraged to think critically, collaborate, and explore challenging concepts more deeply than in traditional lecture-based classes (Baig & Yadegaridehkordi, 2023).

➤ **Flexible and Self-Paced Learning**

The flipped classroom allows students to learn at their preferred speed because instructional materials can be paused, rewind, or rewatched. This feature benefits learners with different abilities and learning styles, giving them more control over how they digest content. It reduces pressure on students who may struggle with fast-paced lectures and ensures that all learners can achieve foundational understanding before engaging in higher-level classroom activities.

➤ **Increased Teacher–Student Interaction**

Because teachers are not spending class time lecturing, they can move around the room, provide guidance, answer individual questions, and offer immediate feedback. This feature promotes stronger teacher–student relationships and targeted support, especially for students who may need extra help. The teacher becomes more of a coach or mentor, helping students overcome misconceptions early and develop confidence in their abilities.



➤ **Enhanced Collaboration Among Students**

Flipped classrooms encourage peer interaction through collaborative tasks such as group discussions, cooperative problem-solving, and project-based learning. This feature helps students learn from each other, share ideas, and develop communication and teamwork skills. Collaborative learning also deepens understanding because students are often required to explain concepts in their own words, negotiate meaning, and combine perspectives to solve complex problems.

➤ **Integration of Technology in Learning**

Technology plays a central role in the flipped model, supporting pre-class activities through videos, learning platforms, quizzes, and digital resources. During class, technology may also be used for simulations, interactive exercises, or instant assessments. This feature modernizes the learning environment and increases students' digital literacy while making the learning experience more engaging and accessible.

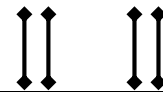
➤ **Continuous Assessment and Immediate Feedback**

The flipped classroom incorporates regular formative assessments, such as pre-class quizzes, in-class exercises, and interactive checks for understanding. Because the teacher is actively engaging with students during class activities, feedback is immediate and specific. This ongoing assessment helps identify learning gaps early, reinforces important concepts, and ensures that students remain on track with the course objectives (Divjak et al, 2022).

**The Effect of Flipped Classroom on Students Centered Learning**

The flipped classroom paradigm, which transfers control of basic subject acquisition from the teacher to the student, has emerged as one of the most significant contemporary pedagogies for fostering student-centered learning. The flipped method reserves classroom time for active, collaborative, higher-order activities while students interact with educational resources—such as texts, films, and digital modules—prior to class. According to Chen and Hou (2020), this structure empowers students to take responsibility for their learning pace, improves preparation, and creates more meaningful classroom interactions. The fundamental principles of student-centered learning are directly strengthened by this transition from teacher-directed lectures to learner-driven preparation.

Increased student involvement is one of the main outcomes of flipped classrooms. Research indicates that students who engage with instructional materials before class are more engaged during in-person sessions because they have questions and past knowledge. As explained by Al Mamun and Azad (2021), flipped learning increases student motivation and encourages deeper involvement because classroom time is used for problem-solving and discussion instead of passive listening. This is consistent with student-centred learning, which prioritizes student involvement, discussion, and cooperative knowledge production. Additionally, flipped classrooms improve self-regulated learning and autonomy, two essential components of student-centered teaching. Lim and Wang (2022) found that students in flipped environments developed stronger self-management skills, including time planning, note-taking discipline, and self-paced learning. Learners have greater autonomy in grasping concepts because they can pause,

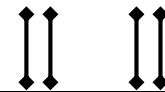


rewind, and revisit pre-class material. This enhances self-directed learning practices that are rarely supported in typical lecture contexts.

Additionally, flipped classes encourage higher-order thinking and knowledge application. Teachers can employ active-learning techniques, including peer teaching, project activities, case analysis, and problem-based learning while they are not speaking during class. According to Zhao and Lai (2023), students in well-structured flipped courses performed significantly better in tasks requiring critical reasoning and application because the model promotes hands-on activities grounded in real-world contexts. This outcome reflects a student-centered philosophy, which prioritizes mastery through engagement rather than memorization. Flipped classrooms also enhance individualized support and teacher-student interaction. Teachers have more time to evaluate student progress, clear up misconceptions, and lead small-group activities since they are not preoccupied with giving lengthy lectures. Hassan and Mohammed (2020) reported that flipped instruction enhanced individualized feedback, which is essential for student-centered learning because it recognizes learners' diverse needs and learning styles. However, excellent execution is necessary for flipped classes to be effective. The advantages may be diminished by poorly created pre-class materials, students' lack of access to technology, or unstructured in-class activities. Osei and Boateng (2022) warned that flipped classrooms fail to achieve student-centered outcomes if students are not guided on how to interact with materials or if teachers simply replace lectures with unguided group work. Thus, the model requires deliberate planning to function as a fully student-centered strategy.

## **METHODOLOGY**

Descriptive survey design was adopted for this study. The study was carried out in Uyo Metropolis, Akwa Ibom State, Nigeria. The targeted population consisted of all students and teachers in selected secondary and tertiary institutions within Uyo Metropolis. A stratified sampling technique was employed to select 30 students and 10 teachers from each of the 5 selected institutions in Uyo Metropolis. This gave a total sample size of 200 respondents. Data were collected using a structured questionnaire titled “**Flipped Classroom and Student-Centred Learning Questionnaire**” (FCSCCLQ). Face and content validation of the instrument was carried out by an expert in Test, Measurement, and Evaluation to ensure its accuracy, appropriateness, and completeness for the study. The reliability coefficient obtained was 0.86, which was considered sufficiently high to justify the use of the instrument. The data generated for this study were analyzed using appropriate statistical techniques, including descriptive statistics to answer the research questions and regression analysis to test the hypothesis.



**RESULT AND DISCUSSION**

**Research Question 1:**

The research question sought to examine the potency of flipped classrooms on students centered learning. To answer the research question, percentage analysis was performed on the data (see Table 1).

**Table 1:  
Percentage analysis of the potency of flipped classrooms on students centered learning**

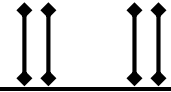
<b>The potency of flipped classrooms</b>	<b>Frequency</b>	<b>%</b>
Enhances Student Engagement	59	29.5
Promotes Self-Paced Learning	33	16.5
Encourages Active Learning	28	14
Facilitates Immediate Feedback	24	12
Supports Collaborative Learning	20	10
Improves Academic Performance	19	9.5
Encourages Lifelong Learning Skills	17	8.5
<b>TOTAL</b>	<b>200</b>	<b>100</b>

**\*The highest percentage frequency**

**The least percentage frequency**

**SOURCE: Field survey**

The table 1 presents the percentage analysis of the potency of flipped classrooms on students centered learning. From the result of the data analysis, it was observed that the highest percentage (29.5) was recorded against “enhances student engagement,” while the least percentage (8.5) was recorded against “encourages lifelong learning skills”. This finding is consistent with Rutkiene&Kacar (2022), who explained that students in flipped classrooms can access pre-recorded lectures, readings, and tutorials at their own pace, allowing them to revisit difficult concepts and learn according to their individual learning needs. This flexibility accommodates different learning styles, reduces learning anxiety, and improves comprehension and knowledge retention. In the same vein, Bergmann (2017) emphasized that the flipped classroom model promotes active learning, engagement, and immediate feedback, which helps students internalize knowledge more effectively, particularly in STEM subjects where problem-solving and conceptual understanding are essential. He further noted that these benefits extend beyond academic performance by fostering self-directed learning motivation and cultivating lifelong learning skills in students, which are increasingly important in a rapidly evolving knowledge-driven society.



**Hypothesis One:**

The null hypothesis states that there is no relationship between the flipped classroom and student-centered learning. In order to test the hypothesis, simple regression analysis was performed on the data (see Table 1).

**TABLE 1:  
Simple regression analysis of the relationship between the flipped classroom and student-centered learning.**

<b>Model</b>	<b>R</b>	<b>R-Square</b>	<b>Adjusted R square</b>	<b>Std. error of the Estimate</b>	<b>R Square Change</b>
1	0.93a	0.86	0.86	0.64	0.86

**\*Significant at 0.05 level; df=198; N= 200; critical R-value = 0.139**

The above Table 1 shows that the calculated R-value of 0.93 was greater than the critical R-value of 0.139 at 0.05 alpha level with 198 degrees of freedom. This indicates that there is a significant relationship between the flipped classroom and student-centered learning. The R-Square value of 0.86 indicates that 86% of the variation in student-centered learning is explained by the flipped classroom approach. Therefore, the null hypothesis was rejected. To further analyze the hypothesis, ANOVA was conducted.

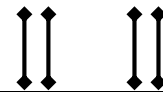
**TABLE 2:  
Analysis of variance of the difference of flipped classroom on student-centered learning**

<b>Model</b>	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	390.285	1	390.285	943.596	.000 <sup>b</sup>
Residual	61.215	148	.414		
Total	451.500	149			

a. Dependent Variable: STU\_CENTRED

b. Predictors: (Constant), FLIPPED

The above table 2 presents the calculated F-value as (943.596) and the significance value as (0.00). Since the significance value (0.000) is less than 0.05. The result indicates that flipped



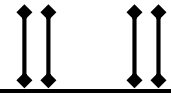
classroom has a significant influence on student-centered learning. Therefore, the null hypothesis is rejected. The result means that there is significant influence in the relationship between flipped classrooms as a correlate of student centred learning. This finding is consistent with the assertion of Chen and Hou (2020), who noted that the flipped classroom approach allows students to engage with instructional materials such as videos, texts, and digital resources before class, while classroom time is used for active, collaborative, and higher-order learning activities. They further emphasized that this approach helps students take responsibility for their learning, improves preparation, and enhances meaningful classroom interaction. In the same vein, Al Mamun and Azad (2021) observed that flipped learning increases students' motivation and promotes deeper participation because classroom time is devoted to discussion, collaboration, and problem-solving instead of passive listening. Therefore, the present finding indicates that flipped classrooms enhance student engagement, critical thinking, independence, and active participation, which are key features of student-centred learning. The result shows it is significant.

## **CONCLUSION**

In conclusion, the flipped classroom model has proven to be a potent instructional strategy that strongly supports the principles of student-centred learning. By shifting foundational content delivery to out-of-class settings and using classroom time for active engagement, the flipped approach fosters autonomy, collaboration, and deeper understanding among students. Evidence from recent studies shows that when learners control the pace of their initial exposure to content, they become more prepared and motivated to participate in interactive classroom activities that enhance critical thinking and problem-solving skills. Furthermore, the integration of digital technologies enables personalized learning experiences and continuous feedback, reinforcing the student-centred orientation of the model. Overall, assessing the potency of flipped classrooms reveals that they offer a meaningful pathway toward more engaging, flexible, and learner-focused education.

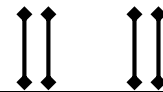
## **RECOMMENDATIONS**

1. Learners should be encouraged to take responsibility for pre-class preparation, as consistent engagement with pre-class materials is essential for meaningful participation and the success of the student-centred flipped model.
2. Classroom activities should be structured to promote collaboration, discussion and problem-solving, ensuring that class time maximizes active learning and reinforces the principles of student-centred instruction.
3. Institutions should provide training and professional development to help educators effectively design and implement flipped classroom strategies that promote student-centred learning and active engagement.



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