Effects of Flipped Classroom Learning on Students' Academic Performance Compared to Traditional Face to Face Learning: A Case study of Kenyatta University

Okita Dan Odhiambo

Department of Educational Foundations, Kenyatta University

Abstract: *This paper investigated the effects of flipped classroom learning on students' academic performance, compared to traditional face - to - face learning in Kenyatta University. It was guided by the constructivist learning and cognitive load theories and adopted the descriptive research design. The target population was 5 heads of departments in the School of Education and 145 second year students pursuing post–graduate diploma in education at Kenyatta University. The census method was used to select the 5 heads of department who were involved in the study while Slovin's formula, proportionate and simple random sampling techniques were used to select a sample of 106 students. A questionnaire was used to collect data from departmental heads while an interview schedule was used to gather data from the students. Frequencies and percentage were used to summarize data. The results revealed that majority of the heads of departments felt that flipped classroom promoted flexibility in managing study time (80%) and accessing course material (60%). Majority were also of the view that face - to - face learning promoted development of critical thinking (80%), understanding of course content (60%), collaboration and interaction with peers (60%), and engagement in class discussion (60%). Further, majority of the students reported that instructors in flipped classrooms ensured tasks were completed by discussing and assessing pre - class assignments. The study concluded that flipped learning was valued because it enhances access to course materials and study time flexibility whereas face - to - face learning was preferred as it promotes understanding of course content, collaboration and interaction with peers, engagement in classroom discussions and development of critical thinking. The study recommends that universities should adopt a blended learning model, which combines the strengths of the two approaches to optimize students' academic performance.*

Keywords: Flipped Classroom Learning, Academic Performance, Traditional Face - to - Face Learning, Higher Education, Digital Pedagogy

1. Introduction and Background

Flipped classroom learning is an instructional model that inverts the traditional learning environment by shifting direct instruction outside the classroom and moving activities, including those that may have traditionally been considered homework, into the classroom (Akçayır & Akçayır, 2020). The model entails students first engaging with new material on their own, typically through video lectures, readings, or other online content, before attending class. Students typically complete this pre - class work at home. In the classroom, instead of listening to a lecture, students use class time for interactive activities such as discussions, problem solving, group work, or practical applications of the concepts they have been taught (Bergmann & Sams, 2021). The teacher's role in the classroom shifts from being a lecturer to a facilitator or coach, guiding students as they apply and deepen their understanding of the material. This model can be particularly effective because it allows students to learn at their own pace outside classroom and then use classroom time for more meaningful engagement with the content, often leading to a deeper understanding (Cheng & Ritzhaupt, 2020). It also promotes student - centered learning and active participation in class activities.

In contrast, traditional face - to - face learning relies heavily on in - class lectures where the teacher is the central figure, delivering content directly to students. The conventional model often leaves little room for interaction, collaborative learning, or critical thinking within the classroom setting, (Antonenko, 2019). However, studies indicate that students in traditional face - to - face settings may struggle to retain and apply knowledge effectively due to the passive nature of the instructional approach (Rotellar & Cain, 2020). The lack of individualized learning in traditional face - to - face classrooms can further contribute to disparities in students' understanding and performance.

Butt (2019) compared flipped classroom learning to traditional face - to - face methods, analyzing the impact on students' academic performance across different educational settings. The findings generally indicate that flipped learning contributed to improved test scores, higher engagement levels, and better retention of knowledge compared to traditional methods. Despite these promising results, the success of flipped classroom learning can vary depending on factors such as the subject matter, instructional design and students' readiness for self - directed learning. Understanding how this model compares across diverse global educational contexts remains crucial to optimizing student outcomes.

In United States, flipped classroom learning has been widely implemented, particularly in higher education and secondary schools. Students exposed to flip learning in science, technology, engineering, and mathematics (STEM) courses tend to perform better than those in traditional face - to - face settings do (Seery, 2020). A study by Chen and Wang, (2021) on flipped chemistry classes revealed that students

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demonstrated a 12% improvement in test scores compared to those in conventional classrooms. Additionally, Bishop and Verleger (2013) noted that flipped classrooms led to increased student engagement and more time for collaborative activities during class, which translated into higher academic achievement. However, the effectiveness of this approach can be influenced by the quality of pre - class materials and students' willingness to engage with the content beforehand (Chen and Wang, 2021).

In China, flipped classroom learning has been integrated into various levels of education, driven by the country's focus on enhancing digital learning platforms. Studies conducted in Chinese universities have shown that flipped learning can enhance academic performance, particularly in language learning and business courses (Hodge & Grandgenett, 2021). For instance, Hao and Lee (2020) found that students in a flipped English language course scored significantly higher in exams and exhibited improved language proficiency compared to those in traditional face - to - face classes. The study also highlighted that the flipped model encouraged active participation and critical thinking among students. However, Zhang et al. (2021) observed that cultural factors, such as students' reluctance to challenge authority and limited experience with self - directed learning, can pose challenges to fully realizing the benefits of flipped learning in China.

In Nigeria, the adoption of flipped classroom learning is still in its early stages. A study by Olakanmi (2017) in Nigerian secondary schools found that students in flipped classrooms scored higher in science subjects compared to their peers in traditional face - to - face classrooms. The research showed that the flipped model facilitated better conceptual understanding and active learning among students. However, Adeoye (2020) observed that challenges such as limited access to digital resources and unreliable internet connectivity in rural areas hinder the widespread implementation of flipped learning in Nigeria. Despite these obstacles, there is growing interest in integrating this model into the curriculum to enhance academic performance.

South Africa has witnessed increasing interest in flipped classroom learning, particularly in higher education where digital tools are more accessible. According to Louw and Mavhungu (2019), university students in a flipped engineering course showed improved academic performance, with pass rates increasing by 20% compared to traditional face - to face lecture - based courses. The research highlighted that the flipped approach encouraged more interaction and peer collaboration during class, leading to better understanding of complex topics. However, Govender et al. (2020) noted that the digital divide remains a significant challenge in South Africa, with many students from disadvantaged backgrounds struggling to access online pre - class materials, thereby limiting the effectiveness of the flipped model.

In Kenya, the concept of flipped classroom learning is slowly gaining traction, especially in urban areas and among private schools. Research indicates that students in flipped learning environments perform better academically than those in traditional face - to - face settings. For example, a

study by Otieno and Wanjala, (2020) found that students in a flipped mathematics class in Nairobi County achieved 18% higher scores compared to their peers in traditional face - to - face classrooms. The study attributed this improvement to the increased time for practical exercises and immediate feedback during class sessions. Moreover, Mwangi and Gitonga (2021) observed that the flipped model fosters a more engaging and student - centered learning environment, which enhances conceptual understanding and critical thinking as required by the Competence Based Curriculum.

Despite these promising results, the adoption of flipped classroom learning in Kenya faces significant challenges, particularly in rural areas. According to Kinyua, (2022), limited access to digital devices and reliable internet connectivity hinders the widespread implementation of this approach, especially in public schools. Additionally, the traditional preference for teacher - centered instruction remains prevalent in many educational institutions, making it difficult for flipped learning to be fully implemented. Nevertheless, with the increasing availability of digital tools and growing interest in innovative teaching methods, flipped classroom learning has the potential to significantly enhance students' academic performance in Kenya, especially when implemented with adequate support and resources.

1.1. Statement of the Problem

The shift towards flipped classroom learning in Kenyan universities has raised questions regarding its effectiveness in improving students' academic performance compared to the traditional face - to - face learning model (Otieno & Wanjala 2020). Flipped classrooms, which involve students reviewing learning materials before class and engaging in interactive activities during class time, have been touted as innovative approaches to enhancing academic outcomes. However, their success in Kenyan universities remains limited. According to the Commission for University Education (CUE) (2022), only 30% of Kenyan universities have incorporated the flipped classroom model into their learning systems, indicating slow adoption rates despite global advancements in digital education.

The effectiveness of flipped classroom learning in Kenyan universities is often debated due to concerns about its impact on students' performance. Traditional face - to - face learning remains dominant, largely because students and educators are more accustomed to it. A recent study by the Kenya National Bureau of Statistics (KNBS) (2017) found that 68% of university students reported a preference for traditional face - to - face classes, citing better comprehension and engagement during lessons. These statistics highlight the reluctance to fully transition to flipped learning, as many students believe it does not sufficiently address their academic needs, leading to inconsistencies in learning outcomes.

In addition to preference issues, the digital divide is a significant barrier to the successful implementation of flipped classrooms in Kenya. Data from the Ministry of Education (MoE) (2023) shows that only 50% of university students have reliable access to digital devices and internet connectivity, which are essential for engaging with pre -

class materials. This gap disproportionately affects students from rural areas, who face challenges in accessing necessary resources. The resulting inequity in preparation time and content understanding negatively affects overall academic performance, particularly in cases where the flipped model is not supported by adequate infrastructure.

Another critical factor affecting the success of flipped classroom learning is the preparedness of lecturers to effectively implement this model. According to a survey by the Kenya Institute of Curriculum Development (KICD) (2022), only 35% of lecturers in Kenyan universities have received formal training in digital pedagogy and flipped classroom strategies. The lack of specialized skills in designing and delivering flipped lessons has led to inconsistencies in teaching quality, creating confusion among students and reducing the effectiveness of this learning approach. As a result, students in flipped classrooms may experience lower academic performance due to inadequate guidance and support, hence the need to assess the effects of flipped classroom learning on students' academic performance compared to traditional face - to - face learning: a case study of Kenyatta University.

1.2 Significance of the Study.

The study is significant as it provides empirical insights into the effectiveness of flipped learning in Kenyan higher education, addressing concerns about students' engagements, digital accessibility, and performance disparities. The findings can inform educational policy makers, and institutions in designing more effective learning models.

1.3 Research Question

What is the effect of flipped classroom learning on students' academic performance compared to traditional face - to - face learning at Kenyatta University?

1.4 Theoretical Review

The study was guided by constructivist learning theory and cognitive load theory. Piaget (1964) and Vygotsky (1978) primarily advanced constructivist Learning Theory, it is centered on the idea that learners through experiences and interactions actively construct knowledge rather than passively absorbing. Piaget's developmental stages outline how children construct understanding as they progress through cognitive stages, while Vygotsky emphasizes the social aspects of learning, introducing the concept of the Zone of Proximal Development (ZPD). In educational contexts, this theory underpins instructional methods that focus on students actively engaging with concepts to construct meaningful understanding, aligning well with contemporary approaches such as problem - based learning and flipped classrooms.

In the context of flipped classroom learning, students are encouraged to take a more active role in their learning by engaging with content before class and using class time for collaborative, interactive activities. This aligns with the constructivist approach, where students actively construct

their understanding by applying what they learn in real - world contexts. The flipped classroom supports this theory by providing students with opportunities to engage with materials independently and then participate in meaningful interactions during class, thereby deepening their comprehension.

Cognitive load theory (CLT), developed by Sweller (1988), focuses on how information is processed within working memory and its effects on learning efficiency. The theory posits that working memory has limited capacity, so instructional designs should aim to manage the cognitive load imposed on learners to optimize learning outcomes. Sweller identified three types of cognitive load: intrinsic (related to the complexity of the content), extraneous (caused by poor instructional design), and germane (related to the cognitive processing of the content itself). The primary goal of CLT is to minimize extraneous load while optimizing germane load, thereby the strengths of Cognitive load theory are particularly evident in its application to instructional design. By emphasizing the importance of managing cognitive resources, CLT has led to the development of effective teaching methods, such as the use of worked examples, segmenting complex information, and multimedia instructional designs, (Kalyuga, 2007). The theory is particularly useful in explaining why certain teaching strategies work better than others do, especially in complex subjects like mathematics and science. Additionally, CLT's emphasis on optimizing instructional designs has proven beneficial in digital learning environments, where content can be customized to prevent cognitive overload and enhance retention (Rourke & Sweller, 2009).

The flipped classroom model addresses cognitive load by allowing students to process information at their own pace outside classroom, reducing the overload that can occur in traditional face - to - face lecture - heavy sessions. In the flipped setting, foundational content is learned outside classroom, leaving time for applying and reinforcing knowledge, which is less cognitively demanding. This theory supports the notion that flipped classrooms can improve academic performance by optimizing how cognitive resources are used during learning process.
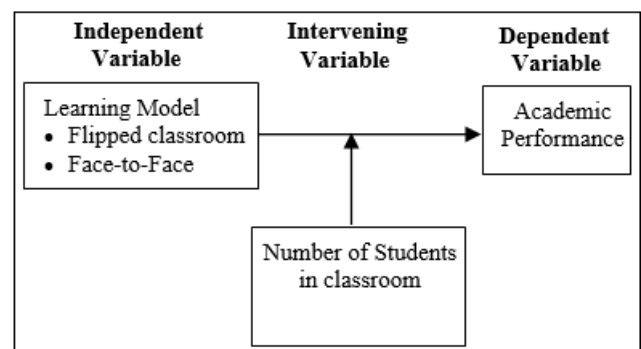
1.5 Conceptual Framework

Figure 1: Conceptual Framework showing the relationship among variables

2. Literature Review

2.1 Flipped Classroom Learning and Students' Academic Performance

Buhl - Wiggers et al. (2023) carried out a study on the insights on a flipped classroom on academic achievement: the challenge of student resistance. Using a randomized controlled trial, the study explored how student responses mediate the effect of flipped classroom on academic performance. The empirical setting was a first - year undergraduate macroeconomics course with 415 students. A comparison between students in the flipped model, and those in traditional classrooms, revealed that the treatment had a statistically insignificant effect on the students' academic performance. However, this effect masks an important mediating point, as students were unexpectedly reluctant to actively participate in the flipped classroom intervention. Consequently, the intervention has a substantially greater effect on academic performance when controlling for the mediating effect of student participation, which leads to consideration of the challenges of student resistance to flipped classroom.

Shao and Liu (2021) investigated the effect of the flipped classroom on students' performance compared to traditional face - to - face classrooms via meta - analysis using predefined eligibility criteria for screening literature. Web of Science (WoS) databases were searched for relevant articles, and 63 experimental articles were included in the meta - analysis. The results indicated that the flipped classroom could improve students' academic performance. The subgroup analysis showed that the heterogeneity of each subgroup was relatively large, and the sensitivity analysis found that the source of heterogeneity might be caused by the different experimental designs and the specific implementations of the flipped classrooms. The results provided a broad perspective for educators to implement flipped classrooms in the future.

Strelan et al. (2020) did a study on the flipped classroom: A meta - analysis of 198 studies on effects on student performance across disciplines and education levels. Out of this number, 174 studies were conducted at the tertiary level, 21 in secondary schools while 3 were carried out in primary schools. The study involved 33, 678 students. The findings indicated that the flipped classroom model had a moderate positive effect on students' performance regardless of the discipline. The positive effect of the model was attributed to the fact that it provides students with opportunity to engage in structured, active learning and problem - solving.

Cabi (2018) determined the effect of the flipped classroom model on students' academic performance. The aim of the study was twofold. First, it aimed at investigating the effect of the Flipped Classroom (FC) Model on students' academic performance. Secondly, it sought to reveal the students' opinions about the model itself. The students in the experimental group were taught using the Flipped Classroom (FC) Model four weeks, while the lessons in the control group were carried out through traditional face - to - face learning. Both groups were administered a test before and after the teaching. The results showed that there were no

statistically significant differences between the scores of the two groups. However, the result showed that coming to classes prepared and completing the assignments in class were among the benefits of the FC Model.

Didem and Özdemir (2018) examined the effect of a flipped classroom model on students' academic achievement, self - directed learning readiness, and motivation. The participants of this study were 66 students who took the scientific research methods course and were studying in two different classes in the Faculty of Education at Ahi Evran University in the fall term of the 2014 – 2015 academic year. One class was designated as an experimental group and the other one was the control group. The experimental group was exposed to the flipped classroom model to while a classical blended learning method was applied to the control group. An achievement test, a self - directed learning readiness and a motivation scale were used to collect data. Study findings showed that there was a significant difference between groups in terms of academic achievement and motivation. However, no significant difference between the experimental and control groups in terms of self - directed learning readiness was found.

Masadeh (2021), conducted a study on the effectiveness of flipped classroom on the academic performance of university undergraduates. The quasi - experimental approach was used and three achievement posttests were carried out. Participants were (32) students who were in advance distributed into two groups, control and experimental. Analysis of Students' achievement grades revealed that the effectiveness of Flipped Classroom use, as a learning method needs time to take place in students' academic achievement and understanding of the learning materials because it flipped the whole learning process. Students thus needed time to be familiar with this new learning method. The results showed that there was no significant difference between the posttest mean scores of the experimental and control groups at the end of the fifth week. However, there was a significant difference between students' achievement mean scores in the second posttest in favor of students who learnt the course content using Flipped Classroom.

3. Research Methodology

The study adopted descriptive research design, which allows for gathering of in - depth information that may be either quantitative or qualitative in nature. This approach facilitates a multifaceted method for data collection and analysis. According to Kathuri and Pals (1993), descriptive design is majorly concerned with describing the state of affairs, as it exists. The target population of this study was 5 heads of department, in the School of Education and 145 second year students pursuing post - graduate diploma in education at Kenyatta University. The departments sampled were educational foundations, psychology of education, early childhood education, education management policy and curriculum studies and Comtec. The study adopted census technique to incorporate all the 5 departmental heads as their sample size was manageable. For the students, the study adopted Slovin's formula to get a sample of 106 students. The study used a questionnaire to collect data from

departmental heads, while an interview schedule was used to collect data from the post - graduate students. After identifying prospective study participants, the researcher administered the questionnaires to the department heads and interviewed the students. The collected data was checked for errors and summarized using frequencies and percentages and the results tabulated for easy interpretation.

4. Findings

4.1 Comparison between Flipped Classroom Learning and Traditional Face to Face on Students' Academic Performance

Table 1: Comparison between Flipped Classroom Learning and Traditional Face to Face on Students' Academic Performance

	Flipped		Face to Face	
	F	%	F	%
Understanding the course content	2	40%	3	60%
Collaborating and interacting with peers	2	40%	3	60%
Engaging in Class Discussion	2	40%	3	60%
Accessing course materials	3	60%	2	40%
Developing critical thinking	1	20%	4	80%
Flexibility in managing study time	4	80%	1	20%

Key: F – Frequency
Source: Research Data 2025.

From the findings 40% of the respondents indicated they prefer using flipped classroom in understanding the course content while 60% stated they prefer face - to - face. This implies that majority of the students prefer face - to - face learning for understanding the course content. The majority of students stated that they understood the course better through face - to - face learning. In addition, the findings indicated that 40% of the respondents indicated they prefer using flipped classroom in collaborating and interacting with peers while 60% stated they prefer face - to - face in collaborating and interacting with peers. This implies that

majority of the students prefer face - to - face in collaborating and interacting with peers. This was also in agreement with the responses from majority of students who stated face - to - face mode of learning helps them interact with their peers better

Furthermore, the findings indicated that 40% of the respondents indicated they prefer using flipped classroom in engaging in class discussion while 60% stated they prefer face - to - face learning in engaging in class discussion. This implies that majority of the students prefer face to face in engaging in class discussion. Moreover, the findings indicated that 60% of the respondents indicated they prefer using flipped classroom in accessing course materials while 40% stated they prefer face - to - face in accessing course materials. This implies that majority of the students prefer flipped classroom model in accessing course materials. In addition, the findings indicated that 20% of the respondents prefer using flipped classroom in developing critical thinking while 80% stated they prefer face - to - face in engaging in developing critical thinking. This implies that majority of the students prefer traditional face - to - face in developing critical thinking.

Finally, the findings indicated that 80% of the respondents indicated they prefer using flipped classroom learning in ensuring flexibility in managing study time while 20% stated they prefer traditional face - to - face learning in ensuring flexibility in managing study time. This implies that majority of the students prefer flipped classroom learning in ensuring flexibility in managing study time. This was also in agreement with the response from the majority of learners who stated that flipped learning make if flexible for them, which help them to manage their study time.

4.2 Students' Academic Performance

The researcher further sought to assess the levels of students' academic performance; the findings were as indicated in table 2.

Table 2: Students' Academic Performance

Academic Performance	SA		A		U		D		SD	
	F	%	F	%	F	%	F	%	F	%
The use of flipped classroom method has improved student retention rates.	2	40%	2	40%	0	0%	1	20%	0	0%
Students in flipped classrooms have higher graduation rates compared to traditional methods.	2	40%	2	40%	0	0	1	20%	0	0%
A flipped learning approach has helped students complete their degrees in a timely manner.	1	20%	2	40%	0	0%	2	40%	0	0%
Students who engage in flipped classrooms are more likely to continue their education.	2	40%	2	40%	0	0%	1	20%	0	0%
Flipped classroom methods lead to higher course completion rates among students.	2	40%	1	20%	0	0%	2	40%	0	0%
Students in flipped classrooms are more likely to complete assignments on time.	2	40%	2	40%	0	0%	1	20%	0	0%

Key: F – Frequency
Source: Research Data 2025.

From the findings 40% of the department heads strongly agreed that the use of flipped classroom method has, improved student retention rates 40% agreed while 20% of the respondents disagreed. This indicates a general belief that flipped methods positively affect retention. In addition,

40% of the department heads strongly agreed that students in flipped classrooms have higher graduation rates compared to traditional methods 40% of the respondents agreed while 20% of the respondents disagreed. This suggests that many believe flipped classrooms lead to higher graduation rates.

Majority of the learners who stated that flipped classrooms often lead to better academic outcomes because students spend more time engaging with the material in meaningful ways supported this. Improved grades and understanding motivate students to continue with their studies, leading to higher graduation rates.

Moreover, 20% of the department heads strongly agreed that flipped learning approach has helped students complete their degrees in a timely manner 40% of the respondents agreed while 40% of the respondents disagreed. This indicates a strong consensus that flipped learning contributes to timely degree completion, with minimal disagreement. The findings agree with response from majority of the students who argue that through flipped education they are optimistic to finish their course in a timely manner

Furthermore, 40% of the department heads strongly agreed that students who engage in flipped classrooms are more likely to continue their education 40% of the respondents agreed while 20% of the respondents disagreed. This shows a positive view on the likelihood of continued education due to flipped classrooms,

Moreover, 40% of the department heads strongly agreed that flipped classroom methods lead to higher course completion rates among students 20% of the respondents agreed while 40% of the respondents disagreed. This suggests a favorable opinion towards flipped methods improving course completion rates, with some disagreement.

Finally, 40% of the department heads strongly agreed that students in flipped classrooms are more likely to complete assignments on time 40% of the respondents agreed while 20% of the respondents disagreed. The findings agree with the response from student interview where majority of students who argued that instructors in flipped classrooms often assess or discuss pre - class assignments during class, creating accountability for students to complete the tasks.

5. Conclusion and Recommendation

5.1 Face to face learning

From the findings, the study concludes that face - to - face learning is more effective for content comprehension, and peer interaction, whereas flipped learning enhances accessibility and time flexibility. In addition, the study concludes that in a face - to - face learning environment, students benefit from direct interaction with instructors, who can immediately clarify doubts, provide additional explanations, and adapt their teaching methods based on the students' needs. The physical presence of the teacher allows for real - time feedback, enabling students to grasp complex concepts more effectively. This immediacy in communication is often lost in online or hybrid learning environments, where delays in responses and lack of personal connection can hinder students' ability to fully understand the materials used in teaching and learning.

Moreover, face - to - face learning fosters collaboration and interaction among peers, which is essential for a well - rounded educational experience. The classroom setting provides a structured environment where students can engage with each other, share ideas, and work together on projects or discussions. This interaction is not only vital for learning but also for developing social skills, building relationships, and creating a sense of community. In contrast, online learning environments can often feel isolating, with limited opportunities for spontaneous interaction and collaboration. The absence of physical presence can create barriers to effective communication, making it challenging students to connect with their peers in meaningful ways.

Engagement in class discussions is another area where face - to - face learning excels. In a traditional classroom, discussions are dynamic and fluid, allowing for the exchange of diverse perspectives and the development of critical thinking skills. The presence of a facilitator, typically the instructor, ensures that discussions remain focused and productive, while also providing students with the opportunity to practice articulating their thoughts and defending their viewpoints. This interactive aspect of face - to - face learning encourages active participation, which is crucial for deep learning. Online discussions, on the other hand, often lack the spontaneity and immediacy of in - person interactions, leading to less engagement and a more passive learning experience.

Finally, the development of critical thinking skills is greatly enhanced in a face - to - face learning environment. Critical thinking requires students to analyze, evaluate, and synthesize information, skills that are best cultivated through active participation and engagement in the learning process. In a classroom setting, students are challenged to think critically by engaging in debates, solving problems collaboratively, and receiving immediate feedback from both instructors and peers. This continuous exchange of ideas and perspectives sharpens students' analytical abilities and prepares them for real - world challenges. While online learning platforms may offer opportunities for critical thinking, the lack of direct interaction and the potential for distractions can make it more difficult for students to fully engage in this type of cognitive work.

5.2 Flipped Learning

In addition, the study concluded that that flipped learning is preferred in accessing course materials and in ensuring flexibility in managing study time. Flipped learning, which inverts the traditional learning environment by delivering instructional content outside of the classroom and using in - class time for interactive activities, presents distinct advantages, particularly in terms of accessibility and time management.

Firstly, one of the primary benefits of flipped learning is the ease with which students can access course materials. In a flipped classroom model, instructional content is typically delivered through online platforms in the form of videos, readings, or other digital resources. This allows students to access materials at their convenience, enabling them to learn at their own pace. Unlike traditional face - to - face learning, where students are required to be physically present in a classroom at a specific time, flipped learning removes these

constraints, allowing students to engage with course content whenever and wherever they choose. This on - demand access is particularly beneficial for students who may have varying learning paces, as it gives them the freedom to revisit materials as often as needed to fully understand the concepts being taught.

Moreover, the accessibility of course materials in a flipped learning environment extends beyond just convenience. It also caters to diverse learning styles by providing content in multiple formats—such as videos, podcasts, or interactive modules—that students can choose from based on their preferences. This adaptability helps ensure that all students have the opportunity to engage with the material in a way that suits their individual learning needs, which can lead to better comprehension and retention of information.

Another key advantage of flipped learning, as the study concludes, is the flexibility it offers in managing study time. Traditional face - to - face learning often involves a fixed schedule, requiring students to adhere to a rigid timetable that may not always align with their personal lives or commitments. In contrast, flipped learning empowers students to take control of their study schedules. By allowing students to engage with instructional content on their own time, flipped learning accommodates different lifestyles and obligations, whether they be work, family, or other responsibilities.

This flexibility in time management is particularly valuable in today's fast - paced world, where students are often balancing multiple responsibilities. Flipped learning provides the opportunity for students to integrate their studies into their daily lives without the pressure of having to attend scheduled classes at specific times. This autonomy not only reduces stress but also encourages students to develop self - discipline and time management skills, as they must take responsibility for completing their coursework independently.

5.3 Recommendations

From the findings, the study recommended that universities should consider adopting a blended learning model that combines the strengths of both flipped classroom and traditional face - to - face learning. This approach allows students to benefit from the accessibility and flexibility of flipped learning while also enjoying the interactive and collaborative elements of face - to - face learning. Universities should design courses that strategically use flipped learning for content delivery and face - to - face sessions for activities that require critical thinking, peer interaction, and in - depth discussion. This would ensure a balanced learning experience that caters to various learning needs and preferences.

To fully capitalize on the advantages of flipped learning, universities should ensure that all students have access to the necessary technological resources. These includes providing access to reliable internet, digital devices, and learning platforms where instructional materials can be accessed.

References

[1] Adeoye, I. (2020). COVID - 19 and E - learning: Nigeria tertiary education system experience. *International Journal of Research and Innovation in Applied Science*, *5* (5), 28 - 31

[2] Akçayır, G., & Akçayır, M. (2020). The flipped classroom: A review of its advantages and challenges. *Computers & Education, 126*, 334 - 345. https: //doi. org/10.1016/j. compedu.2018.07.021

[3] Antonenko, P. (2019). Bridging theory and practice in educational technology: A practical guide for researchers and practitioners. *Journal of Computing in Higher Education, 31* (1), 122 - 140. https: //doi. org/10.1007/s12528 - 018 - 9195 - 3

[4] Bergmann, J., & Sams, A. (2021). *Flip your classroom: Reach every student in every class every day*. International Society for Technology in Education.

[5] Bishop, J., & Verleger, M. A. (2013, June). The flipped classroom: A survey of the research. *Creative Education, 9* (9), 1 - 18.

[6] Buhl - Wiggers, J., Lisbeth, W., & Kjærgaard, A. (2023). Insights from a randomized controlled trial of flipped classroom on academic achievement: The challenge of student resistance. *International Journal of Educational Technology in Higher Education*, *20* (1), 1 - 19. https: //doi. org/10.1186/s41239 - 023 - 00413 - 6.

[7] Butt, A. (2019). Student views on the use of a flipped classroom approach: Evidence from Australia. *Business Education & Accreditation, 6* (1), 33 - 43. https: //doi. org/10.2139/ssrn.2334431

[8] Cabı, E. (2018). The impact of the Flipped Classroom Model on students' academic achievement. *The International Review of Research in Open and Distributed Learning*, 19 (3), 202 - 222. https: //doi. org/10.19173/irrodl. v19i3.3482

[9] Chen, Y., & Wang, Y. (2021). Flipped classroom learning in STEM education: A comprehensive study in chemistry courses. *Journal of Science Education and Technology, 30* (3), 275 - 289. https: //doi. org/10.1007/s10956 - 021 - 09858 - x

[10] Cheng, X., & Ritzhaupt, A. D. (2020). A meta - analysis of flipped classroom learning in higher education across disciplines. *Educational Technology Research and Development, 68* (5), 1557 - 1575. https: //doi. org/10.1007/s11423 - 020 - 09740 - x

[11] Commission of University Education (2022). *The use of the flipped classroom approach in the teaching of English in a public secondary school in Nairobi County, Kenya: An action research study.* Commission of University Education.

[12] Didem, A., & Özdemir, S. (2018). The effect of flipped classroom model on academic achievement, self - directed learning readiness and motivation. " *Malaysian Online Journal of Educational Technology, 6* (1), 76 - 91. https: //files. eric. ed. gov/fulltext/EJ1165484. pdf

[13] Govender, K., Maharaj, M., & Moodley, P. (2020). Challenges of implementing the flipped classroom model in South Africa: Addressing the digital divide. *South African Journal of Education,* 40 (3), 245–260.

[14] Hao, Y., & Lee, K. S. (2020). Enhancing language learning through flipped classroom models: A comparative study in Chinese universities. *Journal of Language Teaching and Research, 11* (2), 270 - 283. https: //doi. org/10.17507/jltr.1102.09

[15] Hodge, M., & Grandgenett, N. (2021). Exploring digital learning platforms in China: The rise of the flipped classroom. *International Journal of Educational Technology in Higher Education, 18* (1), 1 - 18. https: //doi. org/10.1186/s41239 - 021 - 00282 - 3

[16] Kalyuga, S. (2007). Expertise reversal effect and its implications for learner - tailored instruction. *Educational Psychology Review, 19* (4), 509 - 539. https: //doi. org/10.1007/s10648 - 007 - 9054 - 3

[17] Kathuri, N. J., & Pals, D. A. (1993). *Introduction to educational research.* Egerton University

[18] Kenya Institute of Curriculum Development (2022). *A report on formal training in digital pedagogy and flipped classroom strategies.* Kenya Institute of Curriculum Development.

[19] Kenya National Bureau of Statistics (2017, February). *Preference for traditional face - to - face classes.* Paper presented during IST - Africa Week Conference (IST - Africa) in Nairobi.

[20] Kinyua, A. (2022). Digital learning disparities in Kenya: Barriers to the implementation of flipped classroom models. *Journal of Education and Practice, 13* (9), 68 - 80.

[21] Louw, J., & Mavhungu, T. (2019). Flipping the engineering classroom: Impacts on student performance in South Africa. *Journal of Engineering Education, 108* (1), 53 - 70. https: //doi. org/10.1002/jee.20278

[22] Masadeh, S. (2021). The effectiveness of flipped classroom on the academic achievement of university undergraduates in Najran University. *IJPTE International Journal of Pedagogy and Teacher Education,* 5 (2), 82 - 95. https: //doi: 10.20961/ijpte. v5i2.57290

[23] Ministry of Education, (2023). A report on implementation of flipped classrooms in Kenya. Government Printers.

[24] Mwangi, E., & Gitonga, K. (2021). Evaluating the adoption and impact of flipped classroom models in Kenyan secondary schools. *Journal of Education and Development, 10* (4), 45 - 60.

[25] Olakanmi, E. E. (2017). The effects of a flipped classroom model of instruction on students' performance and attitudes towards chemistry. *Journal of Science Education and Technology, 26*, 127 - 137.

[26] Otieno, T., & Wanjala, S. (2020). Academic performance enhancement through flipped classrooms: Case study of Nairobi County. *International Journal of Educational Research, 8* (3), 115 - 130.

[27] Piaget, J. (1964). Part I: Cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching, 2* (3), 176 - 186.

[28] Rotellar, C., & Cain, J. (2020). The flipped classroom: An opportunity to engage millennial students through active learning. *Journal of Learning and Teaching in Higher Education, 3* (1), 26 - 35. https: //doi. org/10.5204/jlt. he. v3i1.449

[29] Rourke, A., & Sweller, J. (2009). Cognitive load and learning efficiency in multimedia instructional design. *Journal of Educational Multimedia and Hypermedia, 18* (2), 217 - 242.

[30] Seery, M. K. (2020). Moving towards a flipped classroom pedagogy in chemistry. *Chemistry Education Research and Practice, 16* (3), 497 - 506. https: //doi. org/10.1039/c5rp00055b

[31] Shao, M., & Liu, X. (2021). Impact of the Flipped Classroom on Students' Learning Performance via Meta - Analysis. *Open Journal of Social Sciences*, *9* (9), 82–109. https: //doi. org/10.4236/jss.2021.99007

[32] Strelan, P., Osborn, A., & Palmer, E. (2020). The flipped classroom: A meta - analysis of effects on student performance across disciplines and education levels. *Educational Research Review*, 30 (1), 12 - 23. https: //doi. org/10.1016/j. edurev.2020.100314

[33] Sweller, J. (1988). Cognitive load during problem - solving: Effects on learning. *Cognitive Science, 12* (2), 257 - 285. https: //doi. org/10.1207/s15516709cog1202_4

[34] Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

[35] Zhang, Z., Dang, X., & Amer, M. (2021). The role of cultural factors in the adoption of flipped classroom models in China. *Journal of Cross - Cultural Education, 15* (4), 349 - 364. https: //doi. org/10.1007/s12562 - 021 - 09889 - x

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