# Application of Flipped Classroom in Senior Secondary Schools in Onitsha Education Zone, Anambra State, Nigeria

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## ABSTRACT

This study investigated the application of flipped classroom in public secondary schools in Onitsha Education Zone of Anambra State, Nigeria. The study specifically aimed at determining the preparedness of teachers and challenges in the application of flipped classroom. Two research questions and two null hypotheses guided the study. The study employed descriptive survey research design. The sample size for the study comprised 145 teachers (100 in the urban, 45 in the rural) randomly drawn from the 29 public secondary schools in Onitsha Education Zone of Anambra State. The instrument for data collection was the Application of Flipped Classroom Questionnaire (AFCQ) developed by the researchers and validated by experts. The overall reliability coefficient of 0.71 was obtained for the AFCQ. Mean and standard deviation was used to answer the research questions, while independent samples t-test statistic was used in testing the null hypotheses at a 0.05 level of significance. The findings of the study revealed that teachers in public secondary schools in Onitsha Education Zone are not prepared for the application of flipped classroom and the teachers in the Zone agree that there are challenges to the application of flipped classroom. Based on the findings, the researcher recommended that student-teachers should always be well-trained in the use of technology for teaching and learning, especially in the application of flipped classroom. It was concluded that teachers in Onitsha Education Zone are not yet prepared for the application of flipped classroom and there are challenges facing the application of flipped classroom in the area.

**Keywords:** Application, Challenges, Flipped Classroom, Location, Preparedness, Secondary Education.

## INTRODUCTION

The pursuit of creative teaching methods that foster creativity, communication, collaboration, and critical thinking is growing worldwide. To promote effective teaching and meaningful learning, these kinds of strategies are essential. One such method is the flipped classroom approach. In a flipped classroom, both students and teachers engage in personal interactions within the classroom setting. This approach is rooted in Bloom's revised taxonomy of learning, where students first acquire factual knowledge (the foundational levels of cognitive activity), typically outside the classroom, and subsequently concentrate on applying, interpreting, and evaluating this knowledge (the more advanced levels of cognitive activity) during class, with support from their instructors and peers (Yang, Yin & Wang, 2018). Asogwa and Ijente (2022) describe the flipped classroom as an instructional approach and a form of blended learning that alters the typical learning environment by providing instructional content, typically online, outside of the classroom. It represents a teaching model where the recorded lectures and homework components of a course are offered electronically prior to the actual class session. According to Shih and Huang (2020), flipped learning/teaching is a teaching method that upends the traditional concept of classroom-based education, allowing students to engage with the educational material ahead of class, thereby using class time to enhance understanding through problem-solving exercises.

By extension, flipped classroom is essentially concerned with enabling the students to engage with the class work outside the normal four walls of the class. In a flipped classroom, students watch online lessons, collaborate in online discussions, or perform some tasks at home while engaging in concepts in the classroom with the guidance of a mentor or facilitator (Asogwa & Ijente, 2022). Stratton, Chitiyo, Mathende and Davis (2019) state that flipped classroom learning involves moving learning outside the walls of the classroom in order to increase student-teacher interaction when they meet in the classroom because the time the students and the teachers would spend together would be used more effectively. This would also improve students' engagement. The implication here, therefore, is that flipped classroom learning is a teaching strategy that delivers instructional content to students at home through electronic means such as audio tapes, videos, PowerPoint Presentations, e-books, and others; and uses the class time for practical application of the activities explained in the audios, videos and e-books. It is gaining momentum and attention in the learning community and could be selected by educational leaders to positively influence teaching and learning.

The flipped learning approach has been recognized for its numerous benefits. Asogwa and Ijente (2022) describe the benefits of the flipped classroom model, which include enhanced student accountability for their learning, improved academic performance, collaboration skills, growth in interpersonal abilities, innovation among students, the flexibility to learn at one's own pace, and the development of analytical and evaluative skills. Garza (2014) states that flipped classroom instruction allows for more active learning opportunities within the classroom environment and urges educators to consider the integration of active learning as an essential aspect of teaching. By organizing activities for students, flipped classroom learning empowers them to work in small groups or independently while providing teachers the chance to assist with any questions or challenges students may face.

Furthermore, there is increased opportunity for in-depth discussions and activities in the classroom that enable students to gain a more profound understanding of the concepts being taught. The level of interaction between students and teachers serves as a significant factor in enhancing student achievement, and the flipped classroom approach facilitates this through engaging learning experiences. Nonetheless, the structure of the class can differ based on the specific context and course. Numerous variations of the flipped classroom model exist, including the Standard Inverted Classroom, Role-Reversal Flipped Classroom, Discussion-Oriented Flipped Classroom, Demonstration-Focused Flipped Classroom, Faux-Flipped Classroom, Group-Based Flipped Classroom, Virtual Flipped Classroom, and Flipping the Teacher (Bishop & Verleger, 2013). The selection of any of these flipped classroom variations is influenced by the intended goals of the flipped classroom and the preferences of the teacher.

In the application of the flipped classroom model, several factors need to be taken into account. These factors include teacher preparedness, teacher availability, resource availability, and various challenges that may hinder its implementation. The preparation of teachers, both in pre-service and in-service training, is essential for the effective use of the flipped classroom approach in Nigeria. A significant barrier for teachers in utilizing Information and Communication Technology (ICT) in the educational process is the inadequate training to design and oversee digital education programs. Aina and Abdulrahman (2020) pointed out that the most pressing issue facing digital education is the poor quality of teaching staff in Nigeria. It is concerning, especially in this age of ICT, that numerous teachers lack computer literacy (Chukwu, Ezeiruaku & Ofoegbu, 2021). The effectiveness of education is directly related to the competency of the teachers delivering it: the integration of ICTs by teachers enhances lesson effectiveness and elevates the overall teaching quality (Nagoba & Mantri, 2015). As noted by Adhikary (2018), highly qualified teachers who actively utilize ICT for instruction are essential for a successful teaching and learning experience. The application of a flipped classroom model cannot succeed unless teachers are proficient with ICT. It necessitates teachers who are competent in using the necessary technological tools for a flipped classroom environment.

The effectiveness of the application the flipped classroom approach in secondary schools may be influenced by the school's geographical location. In this study, location as a moderating variable refers to the physical setting of the schools, which are categorized into urban and rural areas. Consequently, it also encompasses the regions where the study subjects reside or perform their daily activities. Olawale (2016) notes that schools located in urban environments are more likely to possess features typical of those areas, such as access to electricity and internet services, while rural schools will reflect the characteristics of their surroundings. In this regard, certain

schools are situated in areas where there are supportive amenities that facilitate the use of mobile internet devices, such as electricity and internet connectivity, while others are located in areas lacking these resources. The location in this study refers to the areas in which the schools within the Onitsha Education Zone are found, whether in urban or rural settings. Consequently, the location of schools may significantly affect the application of the flipped classroom approach in secondary schools.

**Statement Of The Problem**

Despite extensive research undertaken by scholars and their suggestions for innovative teaching methods, many educators appear to struggle with adapting to these new approaches. Several factors related to teachers, such as insufficient preparation for employing innovative teaching techniques, a lack of educators skilled in using technological tools, and various challenges associated with implementing these new methods, contribute to this difficulty. In the Onitsha Education Zone, teachers on traditional teaching methods that do not engage all the senses or foster creativity, communication, collaboration, and critical thinking. As a result, students in the area often resort to memorization and reading solely to succeed in exams. Consequently, this leads to unsatisfactory student performance.

It is essential to recognize that the issues mentioned are closely linked to the reading habits of students and the teaching methods that are being impacted by contemporary technological trends. The advent of Internet-enabled devices has captivated and engrossed students' attention, prompting the need to incorporate these trends into the educational experience. With this context in mind, this study aims to explore the use of flipped classroom as a potential solution to the challenges faced in teaching and learning within secondary schools in the Onitsha Education Zone of Anambra State. Additionally, the location of schools will be examined as a moderating variable that may affect the application of flipped classroom in the area.

**Purpose Of The Study**

The general purpose of this study is to investigate the application of flipped classroom in public secondary schools in Onitsha Education Zone of Anambra State, Nigeria. Specifically, the study aims at determining the:

1 preparedness of teachers for the application of flipped classroom.
2 challenges in the application of flipped classroom.

**Research Questions**

The following research questions guided the study.

1. What are the mean scores of teachers in the urban and rural public secondary schools on their preparedness for the application of flipped classroom?
2. What are the mean scores of teachers in the urban and rural public secondary schools on the challenges of the application of flipped classroom?

**Hypotheses**

The following null hypotheses were formulated to guide the study and were tested at 0.05 level of significance.

**Ho1:** There is no significant difference in the mean responses of teachers in the urban and rural public secondary schools on their preparedness for the application of flipped classroom.

**Ho2:** There is no significant difference in the mean responses of teachers in the urban and rural public secondary schools on the challenges of the application of flipped classroom.

## LITERATURE REVIEW

Flipped classroom is an educational strategy that changes the conventional lecture-homework structure.it represents a modern teaching approach that utilizes asynchronous video lectures and problem-solving exercises

as home assignments, while engaging students in collaborative problem-solving activities during class. In traditional classrooms, students attend lectures and then complete homework at home. Conversely, in a flipped classroom, students are required to watch video lectures, read materials, or finish online modules prior to attending class. During class, students participate in activities, discussions, group projects, or practical exercises, with guidance from the teacher. Nwosis, Ferreira, Rosenberg, and Walsh (2016) characterize the flipped classroom as a type of blended learning where students engage with new material online, typically through watching videos, often from home, and the traditional homework is completed in class alongside the teacher instead of being delivered through lectures. The key idea is that by reversing the classroom model, educators are prompted to adopt a role more akin to guides rather than authoritative figures; the teacher's function shifts from being a "sage on the stage" to becoming a "guide on the side." This transformation occurs because there is an opportunity for collaboration between the teacher and the students as they work together on tasks during class time that had been reviewed beforehand. By implementing a flipped classroom approach, educators can foster a more engaging, collaborative, and efficient learning environment that traditional methods may not provide. Moreover, this approach allows teachers to spend more time addressing challenging concepts and offering tailored instruction (Reiser, 2017). The flipped classroom model promotes adaptability, enabling teachers to modify strategies that align with their students' learning needs, thereby enhancing the educational experience. While both teachers and students benefit from this model, a significant drawback is the requirement for professional development. In order to succeed in this somewhat chaotic environment, teachers need to possess considerable knowledge in the subject matter and effective teaching practices (Kashada, Li & Su, 2017).

Some researchers explored the readiness of teachers to utilize the flipped classroom concept. Oteyola, Awopetu, Bello, and Akande (2019) found that the pre-service teachers at Obafemi Awolowo University in Ile-Ife, Osun State, Nigeria, lack the necessary skills for the effective implementation of flipped learning strategies. Similarly, Moreno-Guerrero, Soler-Costa, Marin-Marin, and Lopez-Belmonte (2021) conducted a study to evaluate the capabilities of Spanish teachers in Compulsory Secondary Education (CSE) to implement effective practices in flipped learning and to identify the factors that affect these teachers' development of good practices. The findings reveal that 758 teachers, which is under 50% of those surveyed, possess the necessary skills to effectively implement a methodology centered on flipped learning. In contrast, Kazu and Kurtoglu (2022) looked into the preparedness of secondary school teachers for the flipped classroom approach in Turkey and found that younger teachers who had recently entered the profession demonstrated a generally positive level of readiness.

Some researchers conducted empirical research on the difficulties associated with implementing the flipped classroom strategy. Firstly, Adedoja (2016) indicated that pre-service teachers hold a favorable view towards flipped learning, yet they also face issues such as inadequate internet connectivity and unreliable power supply, among others. Lo and Hew (2017) performed a review in their study to provide a summary of flipped classroom research in K-12 education in China, focusing specifically on identifying and addressing the potential challenges inherent in the flipped classroom method. The challenges of executing flipped classrooms were recognized and classified into challenges related to students, those related to faculty, and operational challenges. In a similar vein, Shnai (2017) performed a systematic review focused on the identified gaps, drawbacks, and challenges based on feedback from both students and faculty regarding the implementation of flipped classrooms in Finland. The categories of obstacles faced by students encompass design problems, technical difficulties, and resource-related issues.

## METHODS

The study employed descriptive survey research design. The sample size for the study comprised 145 teachers (100 in the urban, 45 in the rural) from the 29 public secondary schools in Onitsha Education Zone of Anambra State. Five teachers were conveniently drawn from each of the 29 public secondary schools in Zone. Out of the 29 schools, 20 are in the urban while 9 are in the rural area. The first instrument for data collection was the Application of Flipped Classroom for Poetry Questionnaire (AFCPQ) developed by the researcher and validated by experts. The overall reliability coefficient of 0.71 was obtained. Reliability co-efficient of 0.60 and above is considered good enough in relationship. The researchers used mean and standard deviation to answer the research questions. The independent samples t-test statistic was used in testing the null hypotheses formulated for the study at a 0.05 level of significance.

# RESULTS

**Research Question 1:** What are the mean scores of teachers in the urban and rural public secondary schools on their preparedness for the application of flipped classroom?

**Table 1: Mean and Standard Deviation of teachers on their preparedness for the application of flipped classroom in urban and rural public secondary schools in Onitsha Education Zone**

| S/N | Item Statement | Urban n = 100 | | | Rural n = 45 | | |
|---|---|---|---|---|---|---|---|
| | | **X** | **SD** | **Dec.** | **X** | **SD** | **Dec.** |
| **1.** | I am skilled in the use of technology in teaching. | 1.80 | .83 | D | 1.92 | .95 | D |
| **2.** | As a teacher in my school, I can apply flipped classroom. | 1.86 | .49 | D | 2.31 | .75 | D |
| **3.** | I often use traditional methods in teaching. | 3.77 | .43 | SA | 3.92 | .28 | SA |
| **4.** | I possess basic skill in computer usage. | 3.06 | .54 | A | 3.00 | .58 | A |
| **5.** | I have the ability to prepare videos that I use in teaching. | 1.66 | 1.03 | D | 1.85 | 1.07 | D |
| **6.** | I acquired training in the use of mobile technologies for teaching. | 1.97 | .92 | D | 2.08 | .86 | D |
| **7.** | I shy away from explaining the difficult literary languages of literature to the students. | 1.51 | .56 | D | 1.23 | .60 | SD |
| **8.** | I am skilled in differentiating instruction and can work with individual students or small groups. | 3.17 | .71 | A | 3.00 | .58 | A |
| | **Cluster Mean** | **2.35** | **.36** | **D** | **2.41** | **.41** | **D** |

**Key:** SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree, X = Mean, SD = Standard Deviation, n = Sample Size.

Table 1 shows the mean ratings of teachers in urban and rural public secondary schools in Onitsha Education Zone on their preparedness for the application of flipped classroom. It indicates that the mean ratings of the teachers in the urban and rural public secondary schools to items 1, 2, 5 – 7 are within the limit decision points of 0.50 – 1.49 and 1.50 – 2.49, respectively. This implies that the teachers in the urban and rural areas are not skilled in the use of technology in teaching, cannot apply flipped classroom, not able to prepare videos for teaching, lack training in the use of mobile technologies for teaching and do not shy away from explaining the difficult literary languages of literature to the students. Again, the table shows that the mean ratings of the teachers in the urban and rural public secondary schools to items 3, 4 and 8 are within the limit decision points of 2.50 – 3.49 and 3.50 – 4.00, respectively. The implication of this is that the teachers in the urban and rural areas often use traditional methods in teaching, possess basic skill in computer usage, and skilled in differentiating instruction and can work with individual students or small groups. However, the cluster mean of (Mean = 2.35, SD = .36) and (Mean = 2.41, SD = .41) for the teachers in the urban and rural public secondary schools, respectively, indicate that the teachers are not prepared for the application of flipped classroom. It also implies that though the schools are equipped with computers, the teachers are not trained to use them optimally for instructional delivery.

**Hypothesis 1:** There is no significant difference in the mean responses of teachers in the urban and rural public secondary schools on their preparedness for the application of flipped classroom.

**Table 2: t-test summary on teachers' preparedness for the application of flipped classroom in urban and rural public secondary schools in Onitsha Education Zone**

| Location | N | X | SD | df | t | Sig. | Decision |
|---|---|---|---|---|---|---|---|
| Urban | 100 | 2.35 | .36 | 46 | -.518 | .607 | $HO_1$ accepted |
| Rural | 45 | 2.41 | .41 | | | | |

Table 2 shows the t-test score on the mean ratings of teachers in urban and rural public secondary schools in Onitsha Education Zone on their preparedness for the application of flipped classroom, t(46) = -.518, *p* =.607 > 0.05. Since the *p*-value of .607 is greater than the 0.05 probability level set for the study, the null hypothesis which states that there is no significant difference in the mean responses of teachers in the urban and rural public secondary schools on their preparedness for the application of flipped classroom is accepted. This implies that there is no significant difference in the mean responses of teachers in the urban and rural public secondary schools in Onitsha Education Zone on their preparedness for the application of flipped.

**Research Question 2:** What is the mean score of teachers in the urban and rural public secondary schools on the challenges of the application of flipped classroom?

**Table 3: Mean and Standard Deviation of teachers on the challenges of the application of flipped classroom in urban and rural public secondary schools in Onitsha Education Zone**

| S/N | Item Statement | Urban n = 100 | | | Rural n = 45 | | |
|---|---|---|---|---|---|---|---|
| | | X | SD | Dec. | X | SD | Dec. |
| **9.** | Limited Internet access in my school. | 1.94 | .80 | D | 2.38 | .65 | D |
| **10.** | Lack of computers and Internet facilities in my school. | 1.89 | .47 | D | 2.54 | .88 | A |
| **11.** | Lack of ICT skills needed for flipped classroom by teachers. | 2.63 | .91 | A | 2.38 | .65 | D |
| **12.** | Teachers find it difficult to embrace technology-based teaching and learning. | 3.20 | .58 | A | 2.85 | .90 | A |
| **13.** | Epileptic power supply. | 2.00 | .97 | D | 2.54 | .78 | A |
| **14.** | High cost of smartphones and Internet data. | 3.26 | .44 | A | 3.31 | .48 | A |
| **15.** | Lack of maintenance and technical support. | 3.29 | .46 | A | 3.00 | .58 | A |
| **16.** | Use of flipped classroom in teaching creates heavy workload for teachers. | 3.11 | .47 | A | 2.92 | .64 | A |
| | **Cluster Mean** | **2.66** | **.25** | **A** | **2.74** | **.31** | **A** |

**Key:** SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree, X = Mean, SD = Standard Deviation, n = Sample Size.

Table 3 shows the mean ratings of teachers in urban and rural public secondary schools in Onitsha Education Zone on the challenges of the application of flipped classroom. It indicates that the mean ratings of the teachers in the urban and rural public secondary schools to item 17 are within the limit decision point of 1.50 – 2.49. This implies that the teachers in the urban and rural public secondary schools enjoy unlimited access to Internet. Again, the table shows that the mean ratings of the teachers in the urban and rural public secondary schools to items 18 and 21 are within the limit decision points of 1.50 – 2.49 for the urban and 2.50 – 3.49 for the rural, respectively. The implication of this is that the teachers in the urban schools are not challenged by lack of

computers and Internet facilities, and epileptic power supply, while their counterparts in the rural schools are challenged by these.

Similarly, the table shows that the mean ratings of the teachers in the urban and rural public secondary schools to items 19 are within the limit decision point of 2.50 – 3.49 for the urban and 1.50 – 2.49 for the rural, respectively. This implies that the teachers in the urban schools are challenged by lack of ICT skills needed for flipped classroom, while their counterparts in the rural schools are not challenged by this. Lastly, the table shows that the mean ratings of the teachers in the urban and rural public secondary schools to items 20, 22 – 24 are within the limit decision point of 2.50 – 3.49. This implies that the teachers in the urban and rural schools are challenged by difficulty of teachers to embrace technology-based teaching and learning, high cost of smartphones and Internet data, lack of maintenance and technical support, and heavy workload that use of flipped classroom in teaching creates for teachers. However, the cluster mean of (Mean = 2.66, SD = .25) and (Mean = 2.74, SD = .31) for the teachers in the urban and rural public secondary schools, respectively, indicate that the teachers agree that there are challenges to the application of flipped classroom.

**Hypothesis 2:** There is no significant difference in the mean responses of teachers in the urban and rural public secondary schools on the challenges of the application of flipped classroom.

**Table 4: t-test summary on teachers' responses on the challenges of the application of flipped classroom in urban and rural public secondary schools in Onitsha Education Zone**

| Location | N | X | SD | df | T | Sig. | Decision |
|---|---|---|---|---|---|---|---|
| Urban | 100 | 2.66 | .25 | | | | |
| Rural | 45 | 2.74 | .31 | 46 | -.876 | .385 | Ho1 accepted |

Table 4 shows the t-test score on the mean ratings of teachers in urban and rural public secondary schools in Onitsha Education Zone on the challenges to the application of flipped classroom, t(46) = -.876, $p$ =.385 > 0.05. Since the $p$-value of .385 is greater than the 0.05 probability level set for the study, the null hypothesis which states that there is no significant difference in the mean responses of teachers in the urban and rural public secondary schools on the challenges to the application of flipped classroom is accepted. This implies that there is no significant difference in the mean responses of teachers in the urban and rural public secondary schools in Onitsha Education Zone on the challenges to the application of flipped classroom.

## DISCUSSION

The findings of research question 1 and hypothesis 1 on the preparedness of teachers for the application of flipped classroom in public secondary schools revealed that teachers in public secondary schools in Onitsha Education Zone were not prepared for the application of flipped classroom. It also revealed that there is no significant difference in the mean responses of teachers in the urban and rural public secondary schools in Onitsha Education Zone on their preparedness for the application of flipped classroom. These findings agree with the findings of Oyetola, Awopetu, Bello & Akande (2019) that pre-service teachers lack requisite skills for effective implementation of flipped classroom. It also agrees with Moreno-Guerrero, Soler-Costa, Marin-Marin & Lopez-Belmonte (2021) who revealed that less than half of the teachers surveyed show competences to adequately develop a methodology based on flipped learning. However, the result disagrees with the findings of Kazu and Kurtoglu (2022) who found positive overall readiness among young teachers who recently joined the profession. The implication of this is that teachers' preparedness for the use of technology in teaching and learning is done in teacher education. If they miss it at their pre-service training, it might be difficult to acquire the competency when they are employed. Teachers should always be trained in the use of technology in teaching and learning, especially in the application of flipped classroom.

The finding of research question 2 and hypothesis 4 on challenges of the application of flipped classroom revealed that teachers in Onitsha Education Zone agree that there are challenges to the application of flipped classroom, which include: difficulty of teachers to embrace technology-based teaching and learning, high cost

of smartphones and Internet data, lack of maintenance and technical support, and heavy workload that use of flipped classroom in teaching creates for teachers. It also revealed that there is no significant difference in the mean responses of teachers in the urban and rural public secondary schools in Onitsha Education Zone on the challenges to the application of flipped classroom.

This finding agrees with the finding of Adedoja (2016) who revealed that poor Internet connection and power supply challenge the application of flipped learning in Ibadan, Nigeria. Also, Kashada, Li and Su (2017) who revealed a set of challenges against flipped classroom application in China, Lo and Hew (2017) who identified student-related challenges, faculty challenges and operational challenges against flipped learning in China; and Shnai (2017) who found out that lack of resources, lack of skills, design gaps and evaluation issues are obstacles against the application of flipped classroom strategy in Finland. The implication of this is that for flipped classroom to be effectively applied in the public secondary schools in Onitsha Education Zone of Anambra State, government and management of these schools should find solution to these challenges.

## CONCLUSION

From the findings of the study, the researcher draws the following conclusion that teachers in public secondary schools in Onitsha Education Zone of Anambra State, Nigeria are not prepared for the application of flipped classroom. Again, flipped classroom, if applied in public secondary schools in Onitsha Education Zone will face many challenges. Preparation of teachers should be adequately done during teacher education, especially in the area of use of technological tools in enhancing teaching and learning. Government that own public schools should provide solution to the challenges of using flipped classroom strategy in teaching and learning.

## RECOMMENDATIONS

In line with the findings of the study, the following recommendations were made by the researcher:

1. Student-teachers should always be well trained in the use of technology for teaching and learning, especially in the application of flipped classroom.
2. Government and management of secondary schools should find solutions to the challenges of application of flipped classroom.

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