

Effects of Two Flipped Models on Students' Achievement in Civic Education Curriculum in Calabar Education Zone of Cross River State

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Abstract

The study examined the effects of two flipped classroom models (Group-Based and Standard-Inverted) on students' achievement in civic education in Calabar Education Zone of Cross River State. The study was guided by three null hypotheses. The quasi experimental design, was adopted. The population of the study comprised of 4,414 SS1 students in all the 95 public secondary schools in the zone. The sample size consisted of 160 SS1 Civic Education students. The instrument used for data collection was the self-constructed National Values Content Achievement Test in Civic Education (NVCATCE). The instrument was subjected to face and content validation. A test blue print was used to develop the instrument. The Kuder-Richardson (K20) method was used to obtain the internal consistency of the instrument and 0.71 reliability coefficient was established. Data collected were analyzed using Analysis of Covariance (ANCOVA) to test the null hypotheses at 0.05 level of significance. The result showed, among others, that the two flipped models have positive effects on students' achievement with no significant differences ($p < .05$) between the models. It was recommended that schools as well as teachers should adopt the group-based and standard-inverted flipped classroom models to facilitate students' achievement in civic education and other subjects.

Keywords: *Flipped classroom, students, achievement, civic education, Calabar*

Introduction

Academic achievement which could be in form of continuous assessment or examination is the result of evaluations made during and after a given academic engagement so that educators can objectively assess the level of success or otherwise of an academic exercise. Such evaluations for students in the secondary schools are by way of test/exams items which

require responses (answers) from the students. The summary of students' achievement scores in Civic Education between 2018 to 2024 from the Cross River State Ministry of Education reflects a disparagingly poor performance in the subject (EDC, 2024; Udo et al., 2024). It has been a thing of worry for teachers, school management as well as other stakeholders concerning the persistent poor academic achievement by students in Civic Education (Odey et al., 2021). Moreover, the West African Examination Council (WAEC) Chief Examiner's report (2021-2024) indicated a persistent poor performance of students at secondary school certificate examination in civic education.

Within the context of the Nigerian experience, civic education is viewed as an academic discipline designed to inculcate students with the right values, positive attitudes and behaviours that will make them law abiding citizens (Oladele, 2020; Yusuf & Adika, 2017). This stresses the influence of civic education on students' exhibition of acceptable behaviours. Civic Education is also conceptualized as learning that develops students' knowledge, skills, attitudes, beliefs, values and empower them to participate in their society's culture, politics, governance and general democracy (Runhare & Muvirimi, 2017; Adediran & Ajiboye, 2017). It important to understand that while stressing the need for affective (attitudinal) influence of civic education, cognitive aspects and students' achievements are very important as well.

It is evident from literature that there is a positive correlation between academic achievement and interest (Jansen et al., 2016). This implies that positive academic outcome in terms of achievement, could positively influence students' interest in Civic Education. Although, Civic Education is generally perceived as relatively not too hard to comprehend because of its clear content matter and direct relevance (Alscher et al., 2022), one therefore, wonders why there is persistent poor academic achievement by students in Calabar education zone. Extant literature and observation have shown that many senior secondary school students in Calabar have a tendency to downplaying the importance of Civic Education and frowning at its compulsoriness, which could have a considerable negative impact on achievement (Kapur, 2019; Ratnaningsih et al., 2020; Herpratiwi, 2022). Students evade Civic Education classes, perceive other subjects more valuable (Ratnaningsih et al., 2020), and so pay little or no attention during classes; they intentionally do not have Civic Education notebooks/textbooks (Osa-Edoh & Alutu, 2012), have no much regard for Civic Education teachers much as they regard Science teachers, are not eager to call for civic classes, do not prepare adequately for Civic Education exams as much as other subjects, care little about grades, whether high or low in Civic Education (Olaniyi, 2016).

The reason for these negative dispositions among senior secondary school students towards Civic Education has been adduced to some perceived factors among which are: Civic Education is not needed for admissions into higher institutions; it does not provide a clear academic path and lucrative job prospects (Ortan et al., 2022; Firmansyah et al., 2023), Civic Education does not provide intriguing intellectual challenges; most teachers of civic education do not model what they try to inculcate/teach (Olatunde & Adeduntan, 2021). All these perceived factors may have contributed in many ways to influence students' achievement in Civic Education.

Part of the measures put in place to address these problems and encourage students' achievement in civic education, include: making Civic Education a compulsory subject for students at all levels of UBE and senior secondary education (NERDC, 2009; Sanusi & Ali, 2022; Kayode-Olawoyin, 2017); encouraging students to participate in civic related activities like community services, distributing relief materials to the less privileged, among others as part of co-curricular activities for which assessments are made and grades awarded; using relevant instructional materials to facilitate students' understanding in Civic Education. In spite of these efforts, there is still poor achievement in Civic Education among students in Calabar Education Zone.

Considering the poor achievement in Civic Education, one may think better instructional methods would have been employed in the teaching of Civic Education; however, the traditional face-to-face teacher centred method of teaching has continued to prevail. Moreover, the West African Examination Council (WAEC) Chief Examiner's report (2021-2024) pointed out that the persistent poor achievement of students at secondary school certificate examination in Civic Education leaves one in doubt about the effectiveness of instructional delivery approaches used by the teachers for teaching and learning. Hassan (2023) asserted incontrovertibly that the fall in standard of achievement is attributed to poor instructional delivery approach adopted by teachers in schools. To this effect, the WAEC (2021) chief examiner recommended adopting holistic instructional delivery approaches that utilizes learner-centred strategies to help students understand concepts.

The inability of teachers in Calabar Education Zone of Cross River State to employ current innovative instructional approaches in the teaching of Civic Education could be the major setback to maximum academic achievement in Civic Education. The traditional teacher-centred approach may be deficit with the measures that could bring about maximum achievement in 21st century learners whose daily activities centre on the use of technological gadgets like mobile phones, computer and so on. The combination of technology like the social media facilitated by mobile gadgets and computers, coupled with significant learning

experiences could provide an amazing learning platform that could bring about maximum academic achievement.

There are innovative result-oriented instructional strategies combined with technology in the 21st century, scientifically proven to be more effective than the traditional teacher-centred methods (Ganimian et al., 2020; Ghavifekr & Rosdy, 2015). In other words, learner-centred technology driven instructional strategies have been found to bring about better learning outcomes in line with academic achievement. To this extent, it is important that in teaching Civic Education, provision should be made for innovative approaches that enhance effective students' collaboration through cooperative learning, providing for learning flexibility with the use of technology under teachers' guidance. It is for this reason that the researchers employed the flipped classroom (FC) instructional strategy. The flipped classroom is adopted for this study because it integrates considerably features of innovative learning such as cooperative/interactive activities, individualized tasks, flexibility with time, technology-driven and constructive active learners' participation.

Flipped Classroom is a pedagogical approach where the traditional process of classroom content being normally delivered first, followed by homework, is reversed through online instructional videos prepared by the instructor. In this approach, direct instruction moves outside of class, and class time is used for active and engaging activities and providing individualized support (Dalbani et al., 2022). In this model, lessons can be video-taped or audio taped beforehand by the teacher/instructor in order to spend classroom time in problem solving activities. The basic notion is to deliver the teacher's lectures before class through online videos, in order to free-up the class time for active learning and problem-solving activities (Lo & Hew, 2017).

As a tech-driven instructional pedagogy, the instructional benefits of the Flipped Classroom over other methods have been presented in many empirical works. Flipped classroom enhances learner-centred instruction; individualized support (Davies et al., 2013), self-paced learning and flexibility, provides activities that compel students to apply the knowledge or skills acquired from the online interface to real life situation. It makes class time more practical than inactive, because lecture content can be simplified into manageable length with the most important points without extraneous information, provide more opportunities for active learning and individualized instruction during class time, (Yousefzadeh & Salimi, 2015; Ezeudu & Gbendu, 2020; Hawazen et al., 2019; Chen et al., 2017; Overmyer, 2012; Arnold-Garza, 2014). Two models - the Group-Based Flipped Classroom model and the Standard-Inverted Flipped Classroom model - are considered for this study. The features

of the flipped classroom models in use align with the constructivist and social cognitive paradigms to learning by Bruner (1961) and Vygotsky (1978) respectively.

The Group-Based flipped classroom model is characterized with small groupings of students embarking on collaborative learning through interaction, discussion and sharing of ideas on given task. Lesson starts with lecture videos and other resources shared before class. During in-class activities, students are divided into small groups where they embark on interaction/discussion/cooperative learning with group members. Cooperative learning strategies, have been shown to enhance academic achievement, deeper understanding of the material, better comprehension and retention of information through discussion and collaboration (Johnson et al., 2014). Students freely interact among themselves clearing doubts and misconceptions with teacher's guidance. This model encourages students to learn from one another the right answers, and helps to explain to a peer why those answers are right (Saira & Hafeez, 2021). It could be appropriate for discussing contents for the development of cognitive skills. The major distinction between the two models is that while the group-based model is characterized by small students' groupings (3-5) per group (Brown, 2016), the standard-inverted model is known for its individual activity.

The standard inverted flipped classroom is otherwise known as the traditional flipped classroom, commonly used since the flipped strategy became popular (Brown, 2016; Johnson et al., 2015). With this model, in-class time is devoted to individualized classroom activities and one-on-one with the teacher. Students are assigned the "homework" of watching video lectures and reading any materials relevant to the next day's class. During class time, students practice what they have learned, with the teacher freed up for additional one-on-one time (Saira & Hafeez, 2021). Eryilmaz and Cigdemoglu (2018), and Hawazen et al., (2019) describe this model as individualized flipped classroom (iFC). Saira and Hafeez (2021), Buckman et al. (2019) emphasized the need to create individual activities in and out of the classroom as one of the strategies of active learning. This model is germane for this study as it allows both male and female students concentrate on task performance, reflective thinking, avoiding distraction from others. Ego and Okeke (2016) and Tune et al. (2013) noted that the essential elements of flipped learning, which include pre-class preparation and active in-class engagement, are sufficient to drive improvements in students' achievement.

Existing research in education shows that gender has significant influence on students' academic outcomes (Godspower-Echie & Ihenko, 2017; Adigun et al., 2015). Adigun et al. (2015) asserted that the importance of examining learning in relation to gender is based primarily on the socio-cultural differences between girls and boys. Gender differences in

students' achievement in Civic Education may be significantly informed by their biological sex distinctions which predispose differences in behaviour (Nwaubani et al., 2018). But some findings like Chen et al. (2018) and Eze (2023), showed no significant difference between male and female students' achievement in Trigonometry, whereas other studies (Irianti et al., 2021) contrast such findings. Meanwhile, Tune et al. (2013) findings revealed that the core principles of flipped learning - active pre-class preparation and interactive in-class activities - benefit students equally, irrespective of gender. Hence, this work investigated the moderating influence of gender on students' achievement in Civic education.

The need to investigate how two flipped models can bring about maximum achievement in Civic Education is the concern of this research. Even though much has been published on the effect of flipped classroom on students' variables, there is still a dearth of research in this area as most studies focus on comparing the flipped classroom with other traditional methods. There is no known evidence of any empirical work within the context of the effectiveness of the group-based and standard-inverted flipped classroom models on students' achievement in Civic Education in Calabar Education zone of Cross River State.

Objectives of the study

The objectives of this study were to determine:

1. The effect of the group-based flipped model and standard-inverted flipped model on students' achievement in civic education curriculum.
2. The influence of gender on students' achievement in civic education curriculum.
3. The interaction effect of the flipped models and gender on students' achievement in civic education curriculum.

Hypotheses

Ho1: There is no significant difference in the mean achievement scores of students taught civic education using group-based flipped model and those taught with standard-inverted flipped model.

Ho2: There is no significant difference in the mean achievement scores of male and female students in civic education curriculum.

Ho3: There is no significant interaction effect of the flipped models and gender on students' achievement in civic education curriculum.

Methodology

The quasi-experimental research design, specifically, the 2 x 2 factorial design was used for the research. This design is a special type of design that allows the comparison of similar

groups in terms of baseline (White & Sabarwal, 2014). The treatment variable was the Flipped Classroom Strategy at two levels namely: Group-Based flipped model (X_G) and Standard-Inverted Flipped Model (X_S) while moderating variable is gender at two levels, namely: male (Y_1) and female (Y_2). The design involved the use of subjects, from four intact classes in four schools in this order: 39 students from school (A) and 41 students from school (B) were assigned to experimental group 1, while 38 students in school (C) and 42 in school (D) were assigned to experimental group 2. On the first two days before the commencement of treatment on the experimental groups, the National Values Content Achievement Test in Civic Education (NVCATCE) was administered to the students in each school (Experimental Group1 and Experimental Group2) as a pretest. Five sessions were used for the administration of the treatment. At the end of the treatment which lasted for 2 weeks, post-tests for NVCATCE, NVCII and NVAS were administered to the students. Test items for the post-tests were the same as the pre-tests except that the questions for the NVCATCE were reshuffled.

The study was carried out among senior secondary school students in Calabar Education Zone (CEZ). The researchers' choice of this area was hinged on the poor academic achievement in civic education. The population of the study comprised of all the 4,414 senior secondary one (SS1) student from the 95 public secondary schools in the Zone. The population was made up of 1,974 male and 2,435 female students in SS1 (Secondary Education Board, Calabar, Cross River State, 2023/2024). The sample size of the study comprised of 160 SS1 students, including 73 male and 87 female students. As an experimental study, 160 sample size was used based on the provision of the National Policy on Education on the acceptable/standard class size, at 40 students (FRN, 2014).

The National Values Content Achievement Test in Civic Education (NVCATCE) was used for data collection. The NVCATCE was self-constructed using the table of specification/test blue print based on the curriculum where the objectives are rooted. The test contained 50 multiple-choice items with four options lettered A-D. Each student had to choose the correct answers from the list of options provided. Kuder- Richardson (K-R20) method of internal consistency estimate was used to test the internal consistency of the NVCATCE. The reliability coefficient of 0.71 for NVCATCE was obtained.

The treatment involved the use of two sets of lesson plans, Group-Based Flipped Classroom Model Lesson Plans (GBFCMLPs) and Standard-Inverted Flipped Classroom Model Lesson Plans (SIFCMLPs). The lesson plans were adapted by the researchers from the original developers (Milo, 2024; Robert, 2017). The ASSURE model by Heinich et al. (1999) was adopted to guide the process of the instructional media on Civic Education. Students watched

the instructional media at home uploaded on their WhatsApp handle and a text material was given on the same topics. The statistical package for social sciences (SPSS) software was used. The null hypotheses were tested using analysis of covariance (ANCOVA) at 0.05 level of significance. The use of ANCOVA statistics was appropriate for testing the hypothesis since it enables the researchers to statistically control the initial group differences.

Presentation of results

Ho1: There is no significant difference in the mean achievement scores of students taught civic education using group-based flipped model and those taught with standard-inverted flipped model.

Table 1: Analysis of Covariance (ANCOVA) of the difference in the mean achievement scores of students taught civic education using group-based flipped model and those taught with standard-inverted flipped model

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared (η^2_p)	Dec.
Corrected Model	4220.464 ^a	4	1055.116	46.541	.000	.546	
Intercept	5141.223	1	5141.223	226.780	.000	.594	
PretestAch	4124.403	1	4124.403	181.928	.000	.540	
Group	18.849	1	18.849	.831	.363	.005	NS
Gender	.578	1	.578	.025	.873	.000	NS
Group * Gender	.059	1	.059	.003	.959	.000	NS
Error	3513.936	155	22.671				
Total	240602.000	160					
Corrected Total	7734.400	159					

Note: df= Degree of Freedom, F= F-ratio, Sig.= Significant/probability value, Dec.= Decision, NS = Not Significant, S = Significant

The result in Table 1 reveals that there is no significant difference in the mean achievement scores of students taught national values component of the civic education curriculum using standard-inverted flipped model and those taught with group-based flipped model, ($F(1, 159) = .831, p = .363, \eta^2_p = .005$). This is due to the fact that the associated probability (Sig.) value of .363 is greater than 0.05 level of significance at which the result is being tested. On this note, the null hypothesis which stated that there is no significant difference in the mean achievement scores of students taught civic education curriculum using group-based flipped

model and those taught with standard-inverted model is upheld. Besides, the effect size difference ($\eta^2_p = .005$), indicates that only 0.5% variance exists between the mean achievement scores of students taught using the two instructional models. Therefore, the decision is that there is no significant difference between the effects of group-based flipped model and standard-inverted flipped model on students' achievement in civic education curriculum.

Ho2: There is no significant difference in the mean achievement scores of male and female students in civic education curriculum.

Result in Table 1 also revealed that there is no significant difference in the mean achievement scores of male and female students in civic education curriculum, ($F(1, 159) = .025, p = .873, \eta^2_p = .000$). This is evident as the associated probability (Sig.) value of .873 is greater than 0.05 level of significance at which the result is being tested. On this note, the null hypothesis which stated that there is no significant difference in the mean achievement scores of male and female students in civic education curriculum is retained. The effect size ($\eta^2_p = .000$) indicates that no variance exists between the mean achievement scores of male and female students in civic education curriculum. Accordingly, the decision is that gender has no significant influence on students' achievement in civic education curriculum when taught with the flipped models.

Ho3: There is no significant interaction effect of the flipped models and gender on students' achievement in civic education curriculum.

Result in Table 1 further shows ANCOVA analysis of the interaction effect of flipped model and gender on students' achievement in civic education curriculum. The result shows that the interaction effect of flipped models and gender on students' achievement in the civic education curriculum is not statistically significant ($F(1, 159) = .003, p = .959, \eta^2_p = .000$). This is given the fact that the associated probability (Sig.) value of .959 is greater than 0.05 level of significance at which the result is being tested. Therefore, the null hypothesis which stated that there is no significant interaction effect of flipped models and gender on students' achievement in civic education curriculum is not rejected. Moreover, the effect size difference ($\eta^2_p = .000$), indicates that there exists no variance in the mean achievement scores of students as a result of the interaction effect of flipped models and students' gender. On this note, inference drawn is that the interaction effect of flipped models and gender on students' achievement in civic education curriculum is not statistically significant.

Discussion of the findings

It was revealed that there is no significant difference between the effects of the group-based flipped model and standard-inverted flipped model on students' achievement in civic education curriculum. These findings agree with the positive effects of flipped classrooms on students' achievement which has been well-documented. For example, Chen et al. (2017) highlighted that flipped classrooms can improve students' performance by providing more opportunities for active learning and individualized instruction during class time. This study's finding that both models improve achievement aligns with their result. According to Johnson et al. (2014), cooperative learning strategies, such as those used in group-based flipped models, have been shown to enhance academic achievement by fostering a deeper understanding of the material, better comprehension and retention of information through discussion and collaboration, as students can clarify doubts immediately within their group and benefit from diverse perspectives. However, the lack of a significant difference between the two models suggests that both are effective in their own right. Tune et al. (2013) found that the essential elements of flipped learning - pre-class preparation and active in-class engagement - are sufficient to drive improvements in students' achievement. It is also in line with the findings by Ego and Okeke (2016) that students' participation and academic achievement were enhanced with the use of flipped classroom. Theoretically, the findings also lend support to Bruner's constructivist theory of instruction and Vygotsky social-cultural theory of cognitive development. More so, on a general note, the flipped classroom strategy can be effective in boosting students' achievement as it integrates learning activities in an environment that engages students, enhancing their cognitive development, and preparing them for meaningful learning.

The findings of the study indicated that both male and female students have similar level of achievement in civic education after being exposed to flipped models. This implies that gender has no significant influence on students' achievement in civic education curriculum. This finding that both genders achieve similarly in flipped classrooms supports the notion of educational equity in flipped learning environments. Davies et al. (2013) observed that flipped classrooms provide individualized learning opportunities that cater for the needs of all students, thereby promoting equal achievement outcomes. These findings are also in consonance with Chen et al. (2018) and Eze (2023), whose findings showed no significant difference between the achievement of male and female students from the experimental group in trigonometry. The results showed that cognitive style and learning strategy significantly affected male and female students' learning performance and satisfaction in both the flipped and revised flipped classrooms.

Nevertheless, the result of the study disagrees with the findings of Irianti et al. (2021) which showed there is a significant positive difference in learning autonomy of male and female students who were taught by means of flipped classroom, with females having more autonomy than males in both classes, even before or after the treatment. In essence, the study found a significant influence of gender on students' learning outcomes. However, the current finding might have also reflected the overall equality in cognitive capabilities and the effectiveness of flipped models in catering for both genders. Therefore, it is possible that students' achievement under the flipped classroom strategy may not be influenced by their gender.

The result of the study also indicated that the interaction effect of flipped models and gender on students' achievement in civic education curriculum is not statistically significant. The absence of a significant interaction effect indicates that flipped models are effective in improving achievement for all students. This finding also aligns with the research by Tune et al. (2013), which demonstrated that the core principles of flipped learning - active pre-class preparation and interactive in-class activities - benefit students equally, irrespective of gender.

Furthermore, the findings are in agreement with Eze (2023), Ego and Okeke (2016) whose findings indicated that there was no significant interaction effect of treatment and gender on students' achievement in their course of study. The universal benefit might be due to the personalized and active learning strategies inherent in flipped models, which cater for diverse learning preferences and needs of both male and female learners. This implies that students' achievement in civic education curriculum as a result of their exposure to two different treatment conditions is not dependent on their gender. The findings could be so because both genders benefited similarly from the flipped models, indicating that the teaching methods were equally effective for male and female students. Moreover, effective teaching strategies should ideally cater for diverse learning needs, which appear to be the case here.

Conclusion

The study provides empirical evidence supporting the effectiveness of flipped classroom models in enhancing students' achievement in Civic Education. It confirms that both group-based and standard-inverted flipped models can be successfully implemented to foster positive educational outcomes. The research highlights the gender-neutral benefits of flipped classroom approaches, demonstrating that both male and female students can equally benefit from these instructional methods. This contributes to the understanding of flipped classrooms as inclusive teaching strategies. The demonstrated effectiveness of flipped classrooms suggests that these models can be integrated into curricula to improve student engagement and achievement in Civic Education and other subjects.

Recommendations

Based on the findings of this study, it is recommended that:

1. The two flipped models experimented in this study should be adopted by teachers of civic education because of the established effects of the models in students' academic performance.
2. School administrators should organize seminars or training for teachers on the use of flipped models in the classroom.

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