



## Improving NCE students' achievement and retention in office practice using flipped classroom instructional approaches: An implication for vocational education

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### Abstract

The proficiencies of Flipped classroom instructional approaches on students' achievement and retention in office practice was established. Anon-equivalent groups quasi experimental research design was used for the study with a sample size of 69 students. Achievement and retention of students in Office practice were measured using office Practice Achievement Test (OPAT). Using Kuder-Richardson 20 (K-R20) formula, the internal consistency reliability coefficient of OPAT was calculated at 0.89. The test re-test method was used to assess the reliability coefficient of OPAT at 0.91 The data were analyzed using mean and standard deviation while analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. The study found that the flipped classroom instructional approaches enhanced students' achievement and retention in office practice. Based on the findings of the study, it was recommended that vocational educators should adopt flipped classroom instructional approach for teaching office practice and other related vocational courses.

**Keywords:** Achievement, retention, office practice, traditional teaching, flipped classroom

### Introduction

Office practice is one of the vocational courses offered by NCE II Business education students in COE, the aim of which is to equip the learner with the basic skills and knowledge of modern office best practices that will enable the recipient to perform effectively in classroom and offices after graduation. Its importance cannot be over emphasized as it helps the recipient to acquire the knowledge of overseeing and make best use of available resources to keep cost down. However, in spite of its importance to modern day schools and offices, NCE business education students of Bauchi state Colleges of Education and ATAP underachieved in the course (office practice) in semester examinations).and this has significantly affected their achievement in school and practical performance in office work after graduation (Jalam M, and Gambo K (2022) <sup>[11]</sup>; Samailla. A and Aminu D (2022).

However, several studies for example Ugwuanyi. (2021) <sup>[28]</sup>, Onyema, E. M. (2019) <sup>[21]</sup>, Sheppard, D. (2018) <sup>[26]</sup>, Sharples, M., Adams, A., Ferguson, R., Gaved, M., McAndrew, P., Rienties, B., ... Whitelock, D. (2018). have attributed the general decline in the achievement of NCE students to include; lack of adequate instructional materials, lack of equipped model office for students practice and poor instructional approach used by the educators to mention but few.; that the traditional method used is ineffective for teaching a course like office practice. They urge for the use of more innovative technology-based strategy that will enhance NCE students understanding and improve their achievement both within and after school. Flipp classroom was recommended as an appropriate strategy to be used in teaching all other vocational courses Ugwuanya (2021) Bishop & Verleger, (2018) <sup>[7]</sup>; Roeh, Reddy & Shannoh, (2019) Talan and Gulsecen, (2019),

Flipped classroom is a form of blended learning strategy that combines face-to-face learning in the classroom with group discussion and learning outside of the classroom with video lessons and online collaboration. It is a method of

teaching and learning in which students watch a video lesson or recorded lectures outside of class while participating in hands on activities in class. The flipped classroom, also known as the reverse classroom, inverts the standard classroom model with group work done in class and lectures watched at home. The flipped classroom allows the student to have a deeper learning experience when the teacher guides them through the material. The lower cognitive work is done at home while the higher cognitive learning is done in class with the teacher. The teacher in this case gives instructional materials, which usually include a video lecture that the teacher has prepared ahead of time for students to watch outside the class. (Amresh, A, Cartberry, A R and Femiani J (2018); Ankeny C J and Krause S J (2016) <sup>[3]</sup>, Chao C Y, Chen Y T and Chuag K-Y (2019), Chetcuti, S. C., Hans, J. T., and Brent, J. P. (2018).

Accordingly, they asserted that students can spend less time in the classroom listening to lengthy lectures and more time solving in problems individually or collaboratively. Thereby changing the position of classroom instruction and out-of-class homework in a reversed form These contemporary instructional approaches involving technology was found to be effective in improving students' achievement.

Similarly, many researchers such as Ogbonna (2019) <sup>[18]</sup>; Okereke (2018) <sup>[19]</sup>, have carried out studies in the past on retention in several fields, and all viewed retention as an important fuel to students' achievement; that students' retention of contents is facilitated by instructional approach use as this will enable them link the present learning with previous learning. Probably, if what has been learnt is retained, it may lead to higher achievement because retention is measured in alliance with achievement (Jji, 2020) <sup>[12]</sup>. Achievement represents performance outcomes that indicate the extent to which a person has accomplished the specific goals of instruction. While retention is the act of remembering or the ability to recall or recognize what has been learnt or experienced Jiji *et al*, (2020) <sup>[12]</sup>.

However, no publish work was seen on the effect of Flipping instructional approach on NCE vocational student achievement and retention in office practice, thus the basis for this study;

Based on the purpose of the study, the following hypotheses were formulated and tested at 0.05 level of significance to guide the study.

**Ho1:** There is no significant difference in the mean achievement scores of students taught office practice by using flipped classroom and those taught with conventional approach.

**Ho2:** There is no significant difference in the mean retention scores of students taught office practice using flipped classroom and those taught with conventional approach.

**Methodology**

**1. Design of the study and study site**

A non-equivalent groups quasi-experimental research design was used in the study. The research was conducted in Bauchi state colleges of education Bauchi State.

**2. Population of the study**

NCE II 2022/2023 academic session of Colleges of Education Azare and Kangere form the population of the study, no sample as the size of the population is manageable.

**Validation and reliability of measure**

The instrument for data collection was Office Practice Achievement Test (OPAT). The forty (40) items multiple-choice instrument was developed by the researchers within the contents taught. from the NCCE minimum standard syllabus 2012 as amended. Three (3) experts from department of vocational Education, Abubakar Tafawa Balewa University (ATBU) Bauchi, face – validated the OPAT, flipped classroom (FC), CD-ROM containing office practice instructions, Lesson notes and marking guide. Using the Kuder-Richardson 20 (K-R 20) formula, the internal consistency reliability coefficient of OPAT was calculated at 0.89. The estimate of temporal stability of OPAT was determined using test-retest method and was

subjected to Pearson correlation coefficient that yielded a correlation coefficient of 0.91.

**3. Procedure**

Prior to the experiment, students in both study groups were pre-tesedt on OPAT. After the pre-test, both the Experimental (flipped classroom) and the control (traditional classroom) were taught for a period of three weeks. For the flipped classroom group, a day before class, a WHATAPP group was opened for the class members, a video was posted to the students containing the topic of next class to be watched at home. Also prior to class, the flipped classroom group were paired and given CD-ROM containing video lesson on the topics selected to watch in the computer laboratory, without the teacher’s guidance for 15 minutes. This made the students to have the basic knowledge of the content that will be taught in the class. fourth week was assigned to post- testing. After two weeks, the rearranged form of OPAT was administered to both groups to test their retention. In all, six weeks were used for the study from the training stage to the administration of the rearranged form of OPAT.

**4. Ethical approval statement**

Ethical approval for the conduct of this study was granted by the research ethical committee of the researcher’s university. Prior to the conduct of the research, the participants were given informed consent forms to read, fill and sign accordingly.

**5. Data analysis**

Data collected were analyses using mean, standard deviation and Analysis of Covariance (ANCOVA). The research questions were answered using mean and standard deviation while the hypotheses were tested at 0.05 level of significance using Analysis of Covariance (ANCOVA).

**Results**

The results of this study were presented in line with the research questions and hypotheses that guided the study.

**Research Question 1:** What are the mean achievement scores of students taught office practice using flipped classroom and those taught with conventional approach.

**Table 1:** Mean and Standard deviation of achievement scores of both the experimental and control group

Group	N	Pre-test		Post-test		Mean gain
		Mean	SD	mean	SD	
Experimental	42	30.03	9.15	3.85	11.30	40.83
Control	40	30.39	9.37	60.79	88.8	30.41

Source: Fieldwork 2023

Table 1 above shows that the students taught office practice using flipped classroom approach had pre-test mean achievement score of (M = 33.02, SD= 9.15) and a post-test mean achievement score of (M = 73.85, SD= 11.37), while the students taught office practice using conventional approach had pre-test mean achievement score of ( M = 30.38, SD= 9.37) and a post-test mean achievement score of (M = 60.79, SD= 8.88). The mean gain scores of 40.83 and 30.41 for the students in the flipped classroom group and

those in the conventional group respectively indicate that the students in the flipped classroom group had higher posttest mean achievement score than their counterparts in control group.

**Ho1:** There is no significant difference in the mean achievement scores of students taught office practice using flipped classroom and those taught with conventional method.

**Table 2:** Analysis of covariance (ANCOVA) of the difference in the mean achievement scores of students taught Office practice using flipped classroom and those taught with conventional instructional approaches

Source	Sum of square	Df	Mean square	F	Sig	Remark
Corrected model	3643.926	4	910.981	8.758	.000	
Intercept	21378.023	1	21378.023	205.528	.000	
Pretest	276.986	1	276.986	2.663	.107	
Treatment	2721.521	1	2721.521	26.165	.000	S
Error	7697.112	74	104.015			
Total	370273.000	62				
Corrected total	11341.038	64				

Source: field work 2023

**Research Question 2:** what are the mean retention scores of students taught office practice using flipped classroom and those taught with conventional approach.

**Table 3:** the mean and standard deviation of retention score of students taught office practice using flipped strategy and those taught using conventional approach.

Group	No	Post-test		Retention test		Mean gain
		Mean	SD	Mean	SD	
Flipped	62	37.85	11.39	75.83	8.43	1.98
Traditional	64	60.79	8.88	62.05	9.24	1.2

Source: field work 2023

Table 3 above shows that the students in flipped classroom group had post-test mean score of ( M = 73.85, SD= 11.30) and a retention mean score of ( M = 75.83, SD= 8.43), while the conventional group students had post-test mean score of (M = 60.79, SD= 8.88) and a retention mean score of ( M = 62.05, SD= 9.24). The mean gain scores of 1.98 and 1.26 for the students in the flipped classroom group and those in the conventional group respectively indicate that the students in

the flipped classroom group had higher mean retention score than their counterpart.

**Ho2:** There is no significant difference in the mean retention scores of students taught office practice using flipped classroom and those taught with conventional instructional approaches.

**Table 4:** Analysis of covariance (ANCOVA) of the difference in the mean retention scores of students taught office practice using flipped classroom and those taught with traditional instructional approaches

Source	Sum square	Df	Mean square	F	Sig	Remarks
Corrected model	4140.388	4	1035.135	16.614	.000	
Intercept	2750.411	1	2750.411	4.145	.000	
Post-test	1377.130	1	1377.130	22.104	.000	
Treatment	563.351	1	563.351	9.042	.000	S
Error	4610.449	74	62.303			
Total	374183.000	62				
Corrected total	8750.987	64				

Source: 2023

Table 4 above shows that there is a significant difference in the mean retention scores of students taught Office practice using conventional classroom instructional approaches, with those taught using flipped classroom having a higher mean achievement,  $F(1, 74) = 26.165, p < .05$ . Since the associated probability value of 0.000 was less than 0.05 level of significance, the null hypothesis was rejected. Thus, inference drawn therefore was that flipped classroom instructional approach enhanced students' achievement in office practice better than conventional approach.

**Discussion**

This finding showed that flipped classroom enhance students' achievement in office practice. The increase in students' achievement observed in this study after being introduced to flipped classroom instructional approaches supports Vygotsky's theory of learning, which notes that students acquire a new information by social interaction with others. This encourages students to participate actively in the learning process. The study's high achievement backs

up Bandura's social learning theory, which states that people learn new knowledge and behavior by watching others. Students in flipped classroom gain knowledge by watching and recordings of lessons and are required to learn complex new skills with little verbal instruction.

However, it was further confirmed that there is a significant difference in the mean achievement scores of students taught office practice using flipped classroom approach and those taught using traditional instructional approach in favor of those taught with flipped classroom. This finding is in agreement with the finding of Baki and Khaled (2019) [4] who reported that students taught mathematics using flipped classroom performed significantly better than those taught using traditional lecture method. It also agrees with the findings of Muhammad and Falalu (2016) [15] who revealed that flipped classroom model enhances achievement of students in understanding the properties of matter concept in integrated science. Similarly, Ugwuanyi *et al.* (2019b), found that flipped classroom instructional approach enhanced students' achievement in physics.

This result which showed that flipped classroom enhanced students' achievement better than traditional might be because flipped classroom instructional approach provides the students the opportunity to gain first exposure prior to class and increases interaction of the students with the teacher in class. This outcome is consistent with findings of Nwagbo (2016); Ugwu and Nzewi (2015)<sup>[27]</sup> which pointed out that instructional approach affects the quality of output of instruction in teaching.

This finding agrees with Okeyefi (2019), Aninweze (2019) and Chukwu (2017)<sup>[10]</sup> that emphasized that vocational teachers need to use innovative approach for students to retain learned concepts. It was further confirmed that there is a significant difference in the mean retention scores of students taught office practice using flipped classroom approach and those taught with traditional instructional approach in favor of those taught with flipped classroom.

This finding is supported by Mankinde and Yusuf (2018) whose findings revealed that students taught physics using flipped classroom significantly retained higher than those taught with conventional lecture method. This finding that flipped classroom improved students' retention better than conventional may be due to the fact that flipped classroom instructional approach encourages students to use video and other pre-recorded media putting learning in their hands. They have the ability to pause, rewind, and fast forward as needed. Students' retention improves as a result of this. Thus, the use of flipped classroom instructional approach provided a basis for improvement of learner' attainment in office practice.

#### Implications for vocational education

- Teaching vocational courses can be enhanced when educators adopt the use of flipped classroom (FC) instructional approach in colleges of education.
- NCE vocational students' achievement and retention in office practice and other related courses can be improved by the use of flipped classroom
- Quality and effective classroom teachers could be produced to cater for the vocational need of the lower level of the educational sector.

#### Conclusion

The aim of this study was to see how effective flipped classroom instructional approach is at improving students' achievement in office practice. The Flipped classroom improved achievement and retention in office practice, according to the findings. Students who were taught using flipped classroom performed and remembered information better than those who were taught using conventional instructional approach.

#### Recommendations

following recommendations were made that:

1. Teachers should use flipped classroom instructional approach to teach Office practice to enhance students' achievement and retention.
2. Flipped classroom instructional approach should be included by the curriculum planners among the appropriate instructional approaches to teach office technology in Nigerian Colleges of education.
3. Government through NCCE should endeavour to provide appropriate and adequate flipping equipment to all Nigerian colleges of education in support for flipped classroom teaching and learning.

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