FLIPPED CLASSROOM IN THE CONTEXT OF JUNIOR SECONDARY SCHOOL CREATIVE TIE AND DYE IN ABEOKUTA METROPOLIS, NIGERIA

Michael Olubunmi ODEWUMI, Mudasiru Olalere YUSUF

University of Ilorin, NIGERIA

Abstract. The purpose of this study was to find out flipped classroom in the context of Creative Tie and Dye in Junior Secondary Creative Arts in Abeokuta, Nigeria. The study also investigated the influence of gender on the performance of students' taught with flipped classroom. The quasi-experimental design, of post-test was employed. The study sampled five randomly selected junior public secondary schools two. Students from the sampled class were further stratified along gender. The instruments were Creative Tie and Dye Performance Test (CTDPT) and the flip were the test and treatment. Creative Tie and Dye Performance Test (CTDPT) was pilot tested for reliability using the test-retest method of two weeks' interval and Pearson Product Correlation analysis revealed a reliability coefficient value of 0.71. Two hypotheses were tested using ANOVA and t-test analysis. Findings indicated that, students taught with flip classroom performed significantly. It was revealed that the gender of students did not influence the performance of students when they were taught using

flipped. Based on the findings, the study recommended flipped in the teaching of Creative Tie and Dye in Junior Secondary Creative Arts.

Keywords: creative arts, conventional instruction, flip classroom, gender, textile, tie and dye

---

Introduction

Creative arts like other subject on the school curriculum is more of handy than premise. The curriculum is of excitement, realistic and unavoidable on the junior secondary schools in Nigeria. Creative arts mingle the acuity on creativity of sub division of arts like Fine Art, Dance, Drama, Music, and Media Arts, as against the literary locale of the learners. Creative arts develop skills acquisition, knowledge and appreciation of cultural heritage within the context of both learners and instructor. Similarly, it also arouses and ingenious talent, that supports values and inventive works in individual, all these are blend together with other cultures (Usman et al., 2014). Visual Arts has a branch of industrial arts which textile productions is prominent. Whereas, Tie and Dye is a unique unit of manufacturing colourful pattern of a fabric.

The term 'Tie and Dye' has been described by researchers in diverse ways. For example, Gausa & Abubakar (2015) described Tie-Dye as a locally fabric craft which is mostly practiced globally in different methods. Dying material is of natural substances common obtained locally from herbs, leaves, flower, and sound of the earth. The production or making stages of dying any given fabric is very slow this also entails rigorous activities but the end features of the process bright and colourful fabrics. Usman et al. (2014) acquiesced that Tie and Dye is a way of changing the colour of the fabric through immerse the already fold and tie fabric or cloth deeply in to prepared dye liquid solution. Odewumi et al. (2015) described tie as using a rope, thread and raffia to tighten perfectly round a fabric and soak in the prepared dye solution, they further submitted that dye is a liquid chemical substance that has the clout to

change the colour of a cloth. In other words, Odewumi[1)] explicated that Tie and Dye is the method of tying newly and used cloth with raffia and allow the cloth to absorb dye solution for the purpose of changing the colour and when the rope is untied. The untied area shows colourful intricate decorations where the dye solution does not penetrate deeper on the fabric.

Along with the tying method of colouring fabric, that the study of Belfer (1972) presented another method of hot wax resist in dyeing fabric popular called Batik. This process involves creating of a unit of design known as motif in different designs and styles on fabrics with hot melting wax. When the fabric is deeply immersed into the dye solution. The wax is removed after the fabric has been dried with hot Iron. The batik fabric will put forward different design and pattern crated from the wax pattern. Bates & Galloway (2012) confirmed that this process can be interchanging with diverse bright colours and different designs for uniqueness of intricate outcome. In essence, the study of Price et al. (2005) elucidated that dyeing can be executed on newly manufactured fabric and other used regalia. In achieving stated goals on tie and dye, diverse methodology is employed for proper teaching of the content of the topic, among them are, inverting or flipping the classroom. Here the content of study is placed outside the classroom purposely for spending judiciously time in-class for challenging tasks.

Empirical studies on flipped remained controversial among researchers, studies have perceived flip in the classroom in different context. For example, Arnold-Garza (2014) explained flipped classroom, as an innovative teaching process which necessitates the usual content delivery to scholars at their dwelling through electronic strategy and utilised class interaction instance to connect the learners on the practical features of the content.

Also, Halili & Zainuddin (2015) explained that flipped classroom as an instructional performances which centre of attention based on the students watching a prepared video of educational content outside the walls of classroom via e-learning. It involves active involvement of scholars. In a similar

vein, Staker & Horn (2012) perceived inverting, or flipping as a clarification to learning outstanding dilemma because of its technological features based on Web 2.0 where learning take place anywhere outside.

Johnson et al. (2014) affirmed that flip is grouped along the technology of e-learning that are paramount in all level of education. In another vein, the study of Hamdan et al. (2013) established flip as technology of instruction that supports and standardises active learning. Also, Talley & Scherer (2013) referred to flipped classroom as the pedagogical that modernize course contents to be learnt traditionally in classroom via online videos and accepts feedback simultaneously. In essence, Bishop & Verleger (2013) articulated flipped classroom as a system of instruction that are of interactive learning and computer-based features outside the four walls classroom.

Previous studies have also demonstrated the effectiveness of flip classroom. For example, the study of Hagen & Fratta (2014) confirmed that flipped classroom as stimulants in the basic learning of both practical and theoretical content. Also, Kumar & Hsiao (2007) and Mitchell (2014) submitted that flip is learner-centered instructional approaches that fosters learner interest and sustain their attention. Flipped provides exclusive prospect for collaboration, deeper involvement and peer interaction for learners (Johnson et al., 2014).

The study of Zainuddin & Attaran (2015) expressed that understanding and judiciously use of flipped classroom gives positive instructional delivery of content and activities though technological media. Lankford[2)] mentioned that flipped classroom centred and built on the standardise level of the taxonomy domain. In essence, Nederveld & Berge (2015) added that flipped classroom are of the cooperate activities that are of learners' collaboration rather than individual for implementation.

Nevertheless, empirical evidences and studies on flip classroom remain controversial among scholars. For example, Davies at al. (2013) conducted a study on utilising technology of flipped in classroom for content dissimilate and

encouraging learners in various discipline. The findings concluded that embarking on flipped technology was effective, positive and scalable. The study of Strayer (2012) on flipped classroom with introductory to statistics, the findings shows that the students were satisfied and flip promotes co-operation and innovation. Also, Bishop & Verleger (2013) studies confirmed the students' perceptions on flipped classroom as positive and with significantly being different. Zainuddin & Halili, (2016) listed the challenges of flip as follows; the poor quality of video content, unqualified instructors and poor handling of learning resources, implication for government or educators' policymakers on the implementing teaching-learning activities based on flip.

Although, it has been observed that various technological media and online platforms, has been relevant for appropriate teaching of Humanities, Applied science and pure sciences for both academic and professional programmes (Odewumi et al., 2015). The senses of sight and hearing are very useful and of paramount importance to instructional television. However, watching of the learning content on television set and the like without subscription at any time and interact with co-learners and instructors outside of the class is of great privilege in flip classroom.

Researchers have express challenges facing classroom instructional delivery and methods on learning in 21st century. For example, Adegoke (2011) lamented on the conventional instructional delivery in the classroom as having insufficient opportunities to learners and their learning carrier thus created serious setback on the progress of the students. Also, the study of Gambari et al. (2017) elucidated that traditional medium of instruction delivery is a dismal and obsolete to education. Study have stressed that the instructional delivery and pedagogy in the classroom should be varied to achieved the stated educational goal.

To achieved the state objectives, researchers has worked on the effectiveness of flip. For example, Arnold-Garza (2014) mentioned that flipped classroom is positive for instruction. The study of Roach (2014) on economics

by means of a Blog as online plinth to present the instructional video content. It was further observed that students accessed and watched each economics video content by way of weekly blog. Love et al. (2014) study on theories in algebra reported that the screen casts invented for the study in an explicit manner to suit the flipped linear algebra content and the tutor fashioned the teaching using the LaTeX beamer instructional tract makes the instruction to be positive.

Kim & Kim (2014) demonstrated collaborated on Google Docs and Google Hangout, with the study of engineering, sociology and humanities content through developed flipped classroom purposely for watched developed video lectures on YouTube. Also, Hung (2015) utilised a WebQuest to established learners active involvement and participation in learning of English language in flip classroom. The aforementioned are relevant to this study because of the utilisation of video for instructional purposes.

In another development, Abeokuta town is well known for the wide and best products of tie and dye cloth in the Southern part of Nigeria. The students' performances are less expectation on the summative examination, especially on the aspect of creative textiles design and production of tie and dye in arts. Studies established that the students perform well in the practical aspect of the creative textiles design in arts curriculum of tie and dye whereas the theoretical aspects are otherwise. The flipped classroom is employed in teaching of creative textiles design in creative arts in context of junior secondary school creative arts in Nigeria remained unknown. Therefore, the study intend to fill the gap created by the earlier studies on the flipped classroom in the context of creative tie and dye in the junior secondary school in Abeokuta metropolis, Nigeria.

Research questions

The following questions are answered in the study: (i) what is the difference in the performance of students exposed to flip classroom; (ii) what is the difference between the performance of male and female students taught with flip classroom.

Research hypotheses

These null hypotheses were formulated and tested at 0.05 level of significance:

Ho1: There is no significant difference in the performance of students exposed to flip classroom.

Ho2: There is no significance difference between the performance of male and female taught with flip classroom.

Methodology

This investigation adopted for the study was quasi-experimental of post-test. The population used for the study comprised of all the students of Junior Secondary Schools in Abeokuta metropolis, Nigeria. The targeted population consist of five Junior Secondary School Students in Abeokuta. Ogun State, Nigeria. The selection of the school was purposeful and based on the following criteria: (i) the school has been presenting students for external Junior Certificate Examination for the past five years; (ii) qualified and experience instructors has been teaching the subjects the past five years: (iii) availability of a big, ventilated room and comfortable furniture where students can sit to watch video and (iv) constant electricity supply and accessibility of Television set including a video player.

The sample that is the students were assigned into a single group of experimental which was an intact class were used in each of the five school. The Treatment Instrument which consist of content of the lesson and material, the topic of study which consists of six topics which was sub-divided into 18 units of lesson. The topics were extracted from Cultural and Creative Arts syllabus, textile aspect for Junior Secondary School II, that is the Basic eight. The curriculum were prepared by the Federal Government of Nigeria through NADERIC in the year 2009. The content of the topics was prepared by the

researchers using useful educative materials from the Internet, prescribed text-books from the Ogun State ministry of education and contributions from creative art teachers. The topics employed are: Meaning and function of Textile, Meaning of Tie and Dye, Materials for Tie and Dye, the process of dye fabrics. Experienced creative art teacher wrote the course ware having consulted available materials. Computer programmer and educational technologist re-arrange the course ware along the prescribed curriculum. The graphic artist and the video camera complete the course ware. The final editing and product was done and later write to Compass Disk for easy playing on the video player machine and the like.

The treatment instrument is lesson content and material is validated by three educational technology lecturers that have background of fine art and three specialists in the field of classroom, test and measurement. Similarly, field trial validation of the treatment was carried out on 20 students of 50 males and females from a public school which is part of the population but not used for real experiment. The suggestions and comments from the experts and students were used in producing the final copy of the research content material.

The test Instrument - Creative Arts Performance Test (CAPT), consists of two sections of A and B. Section A requested from the learners Bio-data such as: Name of school, Class and Gender. Section B also focused on 25 multiple-choice objective questions. Each item in the instrument has five options (A-E) of possible answer to the objective question. CAPT was administered to the students after the treatment. On the scoring of the multiple-choice items, '2' marks are awarded for each correct answer and '0' for each wrong answer.

The test instrument, Creative Tie and Dye Performance Test (CTDPT) was validated by two Educational Technology experts from a reputable university in Southern part of Nigeria. The experts assessed the face and content validity of the test instrument in relation to the background of syllabus. The experts also examined all the items in instrument with reference to the: appropriateness of the topics, extent and to extent the content covered the topics designed

to cover. Finally, comments, opinions and suggestions of the experts were effected appropriately. To test the reliability of the test instrument, CAPT was administered on 20 students selected for pilot study, sample was drawn from students from another school in Abeokuta, Nigeria, which is part of the population, having similar characteristics with the selected school. The reliability coefficient of 0.71 was obtained using Kuder-Richardson (KR-20).

The students received learning from flip classroom interaction an hour per week in the provided hall of study. At the end of six weeks the five groups were exposed to post-test to measure their performance. Data obtained from the post-test were subjected to data analysis.

Results

Hypothesis One: There is no significant difference in the performance of students exposed to flip classroom.

This hypothesis was tested using ANOVA statistics to compare the students in the five schools. The hypothesis was tested at 0.05 level of significance as shown in Table 1 below.

Table 1. ANOVA result of the performance of students exposed to flip classroom

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	98.090[a]	4	24.523	.995	.414
Intercept	117215.353	1	117215.353	4754.538	.000
Factor	98.090	4	24.523	.995	.414
Error	2342.070	95	24.653		
Total	119952.000	100			
Corrected Total	2440.160	99			

Table 1 indicates that the calculated F value of .995 is significant because the significant value of .41 is bigger than 0.05 alpha levels. The result implies that there is no significant difference in the students in each selected school taught with flip classroom. Therefore, the null hypothesis is not rejected. The result suggested that the students in the five school do not differ significantly when they are exposed to flip classroom. This is revealed in the Table 2.

Table 2. t-test on the performance of students exposed to flip classroom

GROUP	No	X	SD	df	F	Sig.
Male	50	34.40	4.81	98	.136	.713
Female	50	34.16	5.09			

Table 2 indicates that the calculated t value of 136 is significant because the significant value of .713 is bigger than 0.05 alpha levels. The result implies that there is no significant difference in mean scores of both male and female students which are taught with flip classroom. Therefore, the null hypothesis is not rejected.

Discussion

The first result on the analyses indicated there is no significant difference in the performances of students exposed to flip classroom as an instructional medium. The results of the on the second hypothesis indicated no significant difference in the performance of male and female students exposed to flip classroom. In essence, the finding agreed with Zhao & Ho (2014) who confirmed that there are no statistically significant differences in the students with high percentages and others when exposed to flip. It was also in agreement with Bates & Galloway (2012), Schullery et al. (2011) and Butt (2014) findings that

rate flipped classroom as significantly above the average and more positive over the classroom teaching. This finding also support Biggs & Tang (2007) based on their reviewed on flip classroom as learning opportunity and practicable for instruction. Furthermore, the findings agree with Herreid & Schiller (2013) who supported flip classroom as a significantly learning styles for students.

This finding also are supported by Songhao et al. (2011) who study stressed the motivations received by learners from flip. Similarly, the findings agree with Baepler et al. (2014) who concluded that students in the flipped division performed significantly better than others in conventional group. Furthermore, the findings agree with Bergmann & Sams (2012) based on their reviewed on learners' dynamic involvements in flip and were also supported by the findings of Kim & Kim (2014) which confirmed the significance in different courses on flipped. Moreover, the findings conform to the conclusion of Shin (2014) who revealed that flipped classroom had a positive effect on scholars' achievement. Also, it was in agreement with the findings of Lim et al. (2016) who confirmed the significant in demonstrating flipped classrooms and its exceptional features. In essence, Amresh et al. (2013) who study exposed students to innovative approach and fully participation of students in the process.

Although Moroney[3)] reaffirmed and reappraised that the traditional form of instruction was far from being redundant, the findings contradict that of Lavelle et al. (2013) who expressed that flipped is less effective in instructional deliver and McClelland (2013) who particularly stated that the average scores of scholars in conventional format was significantly with higher scores than the students in the flipped.

The finding also in line with Clemens et al. (2013) and Tague & Baker (2014) who study avowed that learners ubiquitously use technological applications and tools that in turn have influx issues that discouraged learning. Also, Everett et al. (2014) who submitted that learners reacted negatively to the flip instructions.

In essence, the study proved the effectiveness of technological innovative pedagogy in the classroom setting which allow learners to connect with active instruction and reduced the stress of physical tutor within the classroom.

Recommendations

Based on the findings of this study, the following recommendations were made: (i) the teachers should not depend on the conventional instruction pattern for delivery content of creative arts; (ii) teachers of creative arts should be expose to different emerging technologies in instruction; (iii) government to encourage the usefulness of technologies for teaching as this could boast the learners performances: (iv) students should explore the opportunities of flipped and utilized for teaching and learning as well as for individual learning.

NOTES

1. Opening speech delivered on May 27th, 2017 at the National Museum Ogbomoso by M. O. Odewumi.
2. https://ileighanne.wordpress.com/2013/01/24/isnt-the-flipped-classroom-just-blended-learning/
3. https://scholarspace.manoa.hawaii.edu/bitstream/10125/27140/1/13132s%20Moroney%20ETEC%20Paper%20for%20TCC.pdf

REFERENCES

Adegoke, B.A. (2011). Effect of multimedia instruction on senior secondary school students' achievement in physics. *European J. Educ. Studies, 3,* 537-541.

Amresh, A., Carberry, A.R. & Femiani, J. (2013). Evaluating the effectiveness of flipped classrooms for teaching CS1. *Proc. Frontiers Education Conf., FIE*, pp. 733–735.

Arnold-Garza, S. (2014). The flipped classroom teaching model and its use for information literacy instruction. *Comm. Inform. Literacy, 8,* 7-22.

Baepler, P., Walker, J.D. & Driessen, M. (2014). It's not about seat time: blending, flipping, and efficiency in active learning classrooms. *Computers & Education, 78,* 227–236.

Bates, S. & Galloway, R. (2012). *The inverted classroom in a large enrolment introductory physics course*: a case study. London: Higher Education Academy.

Belfer, N. (1972). *Designing in batik and tie dye*. Worcester: Davis.

Bergmann, J. & Sams, A. (2012). *Flip your classroom: reach every student in every class every day*. Washington: ISTE.

Biggs, J. & Tang, C. (2007). *Teaching for quality learning at university*. Maidenhead: Open University Press.

Bishop, J. L. & Verleger, M.A. (2013). The flipped classroom*:* a survey of research. *120th ASEE Annual Conference and Exposition,* Paper ID # 6219.

Butt. A. (2014). Student views on the use of a flipped classroom approach: evidence from Australia. *Business Educ. & Accreditation, 6*(1), 33-43.

Davies, R.S., Dean, D.L. & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educ. Tech. Res. & Development, 61,* 563–580.

Everett, J.W., Morgan, J.K., Stanzione, J.F. & Mallouk, K.E. (2014). A hybrid flipped first-year engineering course. *121st ASEE Annual Conf.*

Gambari, A.I., Obielodan, O.O. & Kawu, H. (2017). Effects of virtual laboratory on achievement levels and gender of secondary school chemistry

students in individualized and collaborative settings in Minna, Nigeria. *Online J. New Horizons Educ.,* 7, 86-102.

Gausa, S. & Abubakar, E. (2015). Tie - dye (Adire) among the Jukun people. *Mgbakoigba: J. African Stud., 4,* 1-13.

Hagen, E.J. & Fratta, D. (2014). Hybrid learning in geological engineering: why, how, and to what end. *Proc. Geo-Congress 2014*, pp. 3920-3929.

Halili, S.H. & Zainuddin, Z. (2015). Flipping the classroom: what we know and what we don't. *Online J. Dist. Educ. & e-Learning*, *3*, 15-22.

Hamdan, N., McKnight, P., McKnight, K. & Arfstrom, K.M. (2013). *The flipped learning model: a white paper based on the literature review titled* "a review of flipped learning." Arlington: Flipped Learning Network.

Herreid, C.F & Schiller, N. (2013). Case studies and the flipped classroom. *J. College Sci. Teaching*, *42*(5), 62-67.

Hung, H.-T. (2015). Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning*, *28*, 81–96.

Johnson, L., Adams Becker, S., Estrada, V. & Freeman, A. (2014*). NMC horizon report: 2014*. Austin: New Media Consortium.

Kim, B. & Kim, B. (2014). Korean language culture and discussion class: role-exchange discussion class based on flipped learning. *Woorimal Res., 37,* 141–166.

Kumar, S. & Hsiao, K. (2007). Engineers learn "soft skills the hard way": planting a seed of leadership in engineering classes. *Leadership Management Eng.*, *7*,18–23.

Lavelle, J., Stimpson, M. & Brill, E.D. (2013). Flipped out engineering economy: converting a traditional class to an inverted model. *63rd Ann. Conf. Inst. Ind. Engineers*, pp.468-477.

Lim, C., Kim, S. & Lee, J. (2016). Designing the flipped classroom in higher education (pp. 245-258). In: Spector, J.M., Ifenthaler, D., Sampson, D.G. & Isaias, O. (Eds.). *Competencies in teaching*, learning and educational leadership in the digital age. Berlin: Springer.

Love, B., Hodge, A., Grandgenett, N. & Swift, A.W. (2014). Student learning and perceptions in a flipped linear algebra course. *Int. J. Math. Educ. Sci. & Tech.*, *45*, 317–324.

McClelland, C.J. (2013). Flipping a large-enrollment fluid mechanics course - is it effective. *120th ASEE Annual Conf.*, paper ID # 7911.

Mitchell, J.C. (2014). MOOCS on and off the farm*:* MOOCs and technology to advance learning and learning research. *Ubiquity*, June.

Moroney, S.P. (2013). *Flipped teaching in a College Algebra classroom*: an action research project

Nederveld, A. & Berge, Z.L. (2015). Flipped learning in the workplace. *J. Workplace Learning, 27,* 162–172.

Odewumi, B., Okeke, F., Abdulhammed, A., Uzoma, C. & Okuche, D. (2015). *Cultural and creative arts for basic schools.* Primary. Osogbo: Paulmac.

Price, A., Cohen, A.C., Johnson, I. & Pizzuto, J.J. (2005). *Fabric science*. New York: Fairchild.

Roach, T. (2014). Student perceptions toward flipped learning: new methods to increase interaction and active learning in economics. *Int. Rev. Economics Educ.*, *17,* 74-84.

Schullery, N.M., Reck, R.F. & Schullery, S.E. (2011). Toward solving the high enrollment, low engagement dilemma: a case study in introductory business. *Int. J. Business, Humanities & Technology*, *1*(2), 1-9.

Shin, J.-S. (2014). A case analysis of the educational effect of 'flip' teaching method using presentation and discussion videos - focusing on the students participating the course of "thinking and expression" in Chosun university. *Korean J. Gen. Educ.*, *8*(3), 133-163.

Songhao, H., Saito, K., Maeda, T. & Kubo, T. (2011). Evolution from collaborative learning to symbiotic e-learning: creation of new e-learning environment for knowledge society. *US-China Educ. Rev., 8*, 46-53.

Staker, H. & Horn, M.B. (2012). *Classifying K–12 blended learning*. Boston: Insight Institute.

Strayer, J.F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environment Res.*, *15*, 171-193.

Tague, J. & Baker, G.R. (2014). Flipping the classroom to address cognitive obstacles. *120th ASEE Annual Conf.,* paper ID # 10475.

Talley, C.P. & Scherer, S. (2013). The enhanced flipped classroom: increasing academic performance with student-recorded lectures and practice testing in a "flipped" stem course. *J. Negro Educ., 82*, 339-347.

Usman, A. Odewumi, O. Obotuke, E. Apolola, O & Ogunyinka, C.O. (2014). *Cultural and creative arts book one for junior secondary schools*. Ibadan: Spectrum Books.

Zainuddin, Z. & Attaran, M. (2016). Malaysian students' perceptions of flipped classroom: a case study. *Innovations Educ. & Teach. Int., 53*, , 660-670.

Zainuddin, Z. & Halili, S.H. (2016). Flipped classroom research and trends from different fields of study. *Int. Rev. Res. Open & Distributed Learning, 17*, 313-340.

Zhao, Y. & Ho, A.D. (2014). *Evaluating the flipped classroom in an undergraduate history course.* Harvard: Harvard X Research Memo.

✉ Dr. Olubunmi Michael Odewumi
Department of Educational Technology
University of Ilorin
P.M.B. 1515, Ilorin, Nigeria
E-Mail: agbegilerebunmi2@gmail.com

✉ Prof. Mudasiti Olalere Yusuf, director
Center for Distance Learning
University of Ilorin
P.M.B. 1515, Ilorin, Nigeria
E-Mail: moyusuf@unilorin.edu.ng