

# Critical Assessment of Just-In-Time Teaching Method as Against Conventional Teaching Methods on Academic Performance of Business Studies Students

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## **Abstract**

*This study determines the effect of using "Just-in-Teaching" (JITT) and conventional teaching method (lecture method) on students' academic performance in financial accounting. Two research questions guided the study while two hypotheses were tested. Quasi – experimental research design was adopted. The sample of the study comprised 225 respondents made up of 105 male and 120 female students in Rivers-West Educational Zone. Simple random sampling technique was used to select two secondary schools from each of the eight local government areas in Rivers-West Educational Zone. All the JSS III students offering Business studies in the selected schools were purposively chosen for the study. One school from each of the eight Local Government areas was selected and assigned to experimental group while one school again from each of the local governments was also selected and assigned to control group. Thus, each of the each Local Governments in Rivers-West Educational Zone has one experimental group and one control group. The pre-test and post test were administered to both the control and experimental group. JITT method was used to teach the experimental group while control group was taught the same lesson using conventional method. Also the researchers developed questionnaire whose reliability index was found to be 0.82 using the cronbach Alpha formula. Data collected from study were analyzed. The research questions were answered using mean and standard deviation while hypotheses were tested at 0.05 level of significance using ANCOVA. A number of findings were made from the study which includes: The achievement grades of students taught financial accounting using JITT method are greater than those taught using conventional method; there was significant effect of gender on the students' mean achievement scores of students taught Business studies using JITT method. In line with the finding, it was recommended among other that JITT should be formally adopted for instruction in secondary schools in order to improve students' performance.*

## **1. Introduction**

Evolving a more effective method for teaching the subjects = n secondary schools so that the students' performance will be high, there becomes imperative. The method that comes to mind at this juncture is what is called "Just-in-time teaching (JITT) method. JITT as a teaching method was developed by Novak, Patterson, Garvin & Christian, (1999). It is a teaching method that combined the use of out - of - class web - based exercise with active learning pedagogy. As a teaching method, JITT addresses two critical issues in teaching and learning activities. These issues include the relative scarcity of active learning based teaching method and the lack of new technology – based instructional innovations (Simkins, 2006).

Commented on this method was. Novak, Patterson Garvin and Christian (1999) that:

*Just –In – Time teaching is a teaching and learning strategy comprising two elements: Classroom activities that promote active learning and web – based activities that are based to enhance the classroom component. The two work together to promote as feed back loop that encourages better class preparation by students, course material, and promote feedback on students conceptual understanding of course material, and promote just – in – time modification of class activities and discussion.*

From the above, it is obvious that, in JITT the work students do at home or outside the school official hours is used to leverage the time they spend in class. The use of JITT as a teaching method is very simple. Between classes, students are given short assignments typically focusing on materials that will be covered in the next class. The students do the assignments and submit them electronically to the teacher. Once submitted, the teacher will review the students' JITT response prior to the class and use the responses to organize and modify the upcoming classroom session – hence the "Just – In – Time" label. Excerpts from students' submissions are presented during the class as the bases for discussion. This replaces the traditional lecture method and therefore used to develop following exercise that the students would work on in class.

Several studies within the literature coverage reported persistent poor performance in Business studies by junior secondary school students in junior Certificate Examination (Akinyelure, 1998; Ogunu, 2000). Amongst the factors implicated is students' poor performance in Business studies mostly in the Booking questions as dedicated from the literature, is the predominant use of lecture method (expository method) in teaching business studies. The lecture method of is teacher centered with the teacher acting as repertoire of knowledge while the students are passive listeners or dormant recipients of the lessons. Although the lecture method has the advantages of being less tasking and allows for a wide coverage of content within a short time, and in addition allows for teaching large number of students at the same time. It does not always produce positive learning outcomes in many students. This is because it encourages rote learning (mere memorization of basic rules) which does not enhance meaningful learning or student's academic achievement.

The academic achievement of student is a major indicator as to whether or not learning has taken place (Ogunu, 2000). According to Okoli & Egbunonu (2012), academic achievement involves observable and measurable performance of students that take place in the presence of a standard for measuring academic excellence. It is generally observed that teachers can enhance students' academic achievement by employing different teaching method. In teaching Business studies (bookkeeping unit), variations in teaching methods are well recognized.

The evolutionary effects of JITT as a teaching method have been documented by a number of authorities such as Simkias and Maier (2004). Marrs and Novak (2004); and Marr, Blake and Garvin (2003). The American society for cell Biology (2004) for instance has reported the following revolutionary effects of JITT method on students' learning and success.

- Increase in classroom interactivity;
- Provision of ongoing formative assessment to students;
- Improvement in class preparation;
- Improvement in students study habits.

Furthermore, Cohen, Kulik and Kulik (2009) found that JITT as a teaching method enhanced students performance in mathematics. Again, Greenwood (2001) found that JITT increased students' performance on standard measures of reading language and mathematics. Lazerson, Brown and Hummel (2008) found out that JITT could be used to check truancy. Again, Briz and McLaughlin (2008) discovered that the use JITT to teach mathematics resulted in significant cognitive gains for the experimental group. Fitz-Gibon (2010) found that low achieving students improved better when taught with JITT. Goodlad and Hirst (2004) reported accelerated learning for under achieving pupils who were taught with JITT. Richard (2004) in his study reported the influence of gender on JITT students' achievement

## 2. Statement of problem

It is important to mention here that all the students reviewed were conducted outside the country. Secondly, none of them was carried out using Business studies subject. The above state of affairs creates a gap in knowledge as one cannot readily lay hands on any study carried out locally on how JITT could be used to facilitate students' learning or enhance their academic performance. In addition to the above, the studies reported above ignored the teaching and learning of Business studies. A gap in knowledge is therefore created by the above state of affairs. This study is therefore geared towards filling this obvious gap in literature, therefore becomes the motivation for this study, as academic achievement of students is a major indicator as to whether or not learning has taken place (Ogunu, 2000).

## 3. Purpose of the study

In the face of the apparent gap, the purpose of this study is to empirically compare the effects of JITT method with conventional method (lecture method) on students' academic achievement in Business studies.

Specifically it includes:

1. To find out the extend the academic achievement grades of students taught Business studies (booking unit) lesson using JITT method differ from the students taught the same lesson using lecture method.
2. To find out the extend gender affect students' academic mean achievement in business studies subject in JSS 3 (basic 9)

## 4. Research Questions

The following research questions guided the study:

1. To what extent do the academic achievement grades of student taught business studies lesson using JITT method differ from those of student taught the same lessons using lecture method?
2. To what extent does gender affect students' mean achievement in business studies?

## 5. Null Hypotheses

The following null hypotheses were formulated to guide the study and were tested at 0.5 level of significance.

1. There is no significance in the achievement grades of students taught business studies lesson using JITT method and those taught same lesson using lecture method of instructions.
2. There is no significance effect of gender on the achievement grades of students taught business studies using JITT method and those taught same subject using lecture method of instruction.

## 6. Methodology

The design of the study is quasi experimental, specifically, the pre-test, post test, non equivalent control design. This was used because intact classes were used since it was not convenient for schools used in this to randomly assign students to experimental and control conditions. Pre-tests were administered to all groups. The sample consisted of two hundred and twenty five (225) junior secondary schools (basic 9)' from sixteen (16) class intact classes randomly sampled from sixteen junior secondary schools in Rivers-West Education Zone of Rivers State. All the students are in

basic 9 in two co-educational secondary schools from 8 L.G.As in Rivers-West Education Zone were purposively chosen for the study. One school from each of the 8 L.G.As was randomly selected and assigned to experimental group while one should again from each of the L.G.As was also randomly selected to serve as the control group. The experimental schools were assigned to JITT method of teaching while control schools were assigned to the lecture method of teaching financial accounting. The experimental sample (N = 120) consisted pf 50 boys and 70 girls, while the control sample (N = 1.34) consisted pf 50 boys and 75 girls.

## 7. Instrument

The only instruction for the study was a JITT business studies achievement Test (JIFAAT). JIFAAT is a 30 item multiple choice test developed by the researchers based on the business studies Jss three(3) (basic 9) scheme of work which includes: preparation of trial balance, trading account, profit and loss accounts and balance sheet. Iwara (2011). A test blue print (Appendix 1) was developed based on the relative emphasis on each of topics in the curriculum (appendix refer).

JIFAAT was subjected to both content and face validity. The content validity was accomplished by ensuring that the test reflected the specifications of the test blue print (appendix refer). Face validity was established by evaluating of the test item by three experts in test construction from a university and three experienced senior secondary school financial accounting teachers. 30 items (out of the initial draft 0 50 items) were found suitable in terms of discrimination and facility idiocies after careful items analysis. A reliability coefficient of 0.82 was established using Cronbach Alpha.

## 8. Procedure

The regular business studies teachers in the selected schools were used for the study Teachers who participated in the experimental treatment were subjected to rigorous training regimen for a period of three weeks at two hours per week. The teachers were trained on how to conduct instructions in business studies using JITT method. This was done to ensure uniformity and mastery of the teaching strategy. In addition each teacher in the experimental school was given a copy of the validated lesson plan and a copy of the instrument to be used for data collection. The teachers in the control schools did not receive any

training. They were required to teach the business studies concepts using conventional lecture method of teaching. The researchers vetted the lesson plans prepared by the teachers in the control schools ensure that the lesson plans followed the conventional lecture method. In addition, each teacher in the control schools was given a copy of the instruments to be used for data collection. JIFAAT was administered as pre-test to experimental and control groups before treatment commenced to assess the students' knowledge of financial accounting concepts. Data collected were subject to ANCOVA to determine the homogeneity of the groups.

## 9. Treatment

It is important to note here, that JITT in its form was developed for the developed nations. As a result, it may not operate successfully in a developing

Country like Nigeria where students do not have access to electronic resources. Hence, there is need for modifications.

The following modifications were therefore made:

- The use of web-based resources in replaced with the use of library resources.
- The electronic distribution of warm ups materials to students is replaced with manual distribution during class activities.
- The electronic submission of warm up exercise by students to the teacher is few days

before the actual classroom discussion on the JITT material.

- The use of digital projector to present lessons is replaced by the classroom illustration on the chalkboard.

Based on the above modifications, the treatment was as follows: in the experimental schools, the JITT students were taught using the JITT materials and procedures. The JITT materials were given to learning activities with the use of library resources to facilitate classroom learning. The JITT materials were given to them in form of “warm-ups”. Warm-ups are lesson materials like notes or assignments given to the students to read few days before the class. The

Students were required to complete the warm-ups (assignments) individually at their own pace and submit them few days to the teacher before the class sessions. The teacher read through the students’ submissions. Thus, for the experimental class, the teacher ensured that each lesson was preceded and informed by an assignment made from library resources. The entire class session was characterized by clarification of any confusing concept identified in the students’ responses, class discussion of the materials given (warm-ups), questioning, and assignment of the next warm-ups.

On the other hand, the control group was taught the same course contents covered in the JITT class session using model lesson plans vetted by the researchers. They were taught the lessons using conventional lecture method. JIFAAT was again administered to the students as post-test and their scores were recorded.

## 10. Presentation of Results

Mean and standard deviation scores of students on cognitive achievement in JIFAAT were used to answer the research questions (Table 1 and 2) while ANCOVA was used to test the hypotheses (table 3 and 4) at 5% confidence level. ANCOVA analysis on pre-test scores for subjects in the experimental and control groups was used to establish that the two groups were equivalent before treatment began.

**Table 1:** Pre-test and Post-test Mean Ratings and Standard Deviation of students who received JITT Treatment and those in the Control group.

Sources of Variation	N	Pre-test Mean	SD	Post-test Mean	SD	Mean	Remark
Treatment Group	120	2.14	1.31	4.94	1.05	2.80	Positive effect
Control	105	0.54	1.03	1.62	2.44	1.09	

The result as presented in Table 1 showed that with pre-test mean score of 2.14 and post-test mean scores of 4.94 with mean gain 2.80 for the students treated with the JITT method as against pre-test mean score of 0.53 and post-test mean score of 1.62 with mean gain of 1.09 for the students in the control group. JITT method has positive effect in teaching business studies in secondary schools. With the mean gain of 2.80 for the treatment group, JITT method has a very positive effect on students’ achievement grades.

**Table 2:** Pre-test and Post-test Mean Ratings and Standard Deviation of Male and Female Students in the Experimental Group.

Source of Variation	N	Pre-test Mean	SD	Post-test Mean	SD	Mean	Remark
Male Students	50	0.26	0.24	4.53	1.39	4.27	Positive effect
Female students	70	0.32	0.56	2.41	1.43	2.90	

The result presented in table 2, showed that pre-test mean score of 0.26 and post-test mean score of 4.53 with mean gain of 4.27 for the male students treated with the JITT method. The table also shows pre-test mean score of 0.32 and post-test mean score of 2.41 with mean gain of 2.09 for the female students also exposed to the experimental. Thus implies that gender of the students has very high positive effects on their academic achievement in financial accounting.

**Table 3:** ANCOVA Analysis on the means scores of students taught using JITT and those in the control group

Source of variation	SS	df	MS	f-cal	f-crit	P>0.05
Corrected model	2353673	2	11768.36			
Intercept	958.69	1	958.69			
Pre-test scores	38.09	1	38.09			
Treatment models	3124.45	1	3124.45	183.80	3.99	S
Error	1172.66	17.00				
Residual	19358700	69				
Corrected Total	24709.66					

In table 3, it was observed that at 0.05 level of significance, 1 df numerator and 68df denominator, the f-calculated 183.80 is greater than the f-critical 3.99. Ho is therefore not accepted. This implies that JITT method has significant effect on students' achievement grades in financial accounting.

It can be concluded that JITT method of teaching enhances achievement of financial accounting students than method. This finding is in agreement with Cohen, Kulik and Kulik (2009) who found that students taught mathematics with use of JITT scored 66<sup>th</sup> percentile ahead of those taught the same lesson with lecture method.

The relationship between the above findings with the current study indicate that JITT an improve students' performance no matter the subject area geographical location. This is evident in fact that the study in Nigeria on JITT has shown some similarities with those outside the country

**Table 4:** ANCOVA Analysis on the Effect of Gender on the Achievement Grades of Student taught on business studies using JITT and those in the control group

Source of variation	SS	df	MS	f-cal	f-crit	P>0.05
Corrected model	42.40	1	42.40			
Intercept	23.14	1	23.14			
Pre-test scores	44.60	1	44.60			
Error	403.08	33	12.18	6.14	2.87	S
Residual	28496.00	35				
Corrected Total	448.69	34				

In the table 4, it was observed that at 0.05 level of significance, 1 df numerator and 34 df denominator, the F – calculated 6.14 is greater than the f-critical 2.87 by the result. Ho is not accepted. Therefore, there is significant effect of gender on the students' mean achievement scores among students taught business studies using JITT method and those taught using lecture method.

According to results in table 2, the use of JITT has very high effect on male students with mean gain of 4.27. The method also has high effect on female students with mean gain of 2.09. Thus, the method has a very high effect on the male students with a mean difference of 2.18 against female students.

## 11. Discussion of Results

The discussion of results is done under the following sub-headings:  
Effect of JITT on the Achievement Grades of students

Effects of Gender on the use of JITT Method.

One of the variables investigated in the study was the effect of JITT on the achievement grades of students in business studies. The results in Table 1 show that the achievement grades of students taught business studies using JITT method are greater than the achievement grades of those taught the same lesson using conventional method. In specific term, the experimental group had a mean gain of 2.80 against 1.09 mean gain of the control group. This shows a mean difference of 1.71 in favour of the experimental group.

The above findings are in agreement with Chen, Kulik and Kulik (2009) who found that students taught mathematics with the use of JITT scored 66<sup>th</sup> percentile ahead of those taught the same lesson with conventional method. In support of the same findings. Greenwood (2010) found that JITT increased students' performance on standardized measures of reading. Language and mathematics. The relationship between the above findings with the current study indicates that JITT can improve student's performance no matter the subjects' area or geographical location. This is evident in the fact that the study in Nigeria on JITT has shown some similarities with those conducted outside the country.

One of the variables investigated in the study was the effect of gender on the use of JITT method in teaching business studies. Results in table2, show that gender has a very high positive effect on the academic achievements of students in Business studies. According to the results in the table, male students have mean gain of 4.27 against female students with mean gain of 2.09. The above findings are in agreement with Good and Brophy (1984) who found that boys receive more critics in class and perform high than girls in class.

The predominant use of lecture method in teaching business studies in schools ineffective because it does not enhance achievement for all students and does not promote meaningful learning of the subject. The use of JITT is a powerful innovation in the teaching and learning of business studies which is capable of increasing the achievement grades of instruction. It implies that environmental factors (be it a developed or non-developed) do not form any obstruction in the application of this relatively new method of instruction. As such it is strongly recommended for instruction in business studies and other related areas, at all levels of education.

## 12. Recommendations

Based on the findings of this study the following recommendations were made.

1. JITT should be formally adopted in secondary schools in order to improve students' performance.
2. Several workshops and seminars should be organized for teachers on the used of JITT method in order to make it popular among the teachers.
3. Secondary school libraries should be upgraded electronically to give students access to electronic data-base in order to fully utilize JITT in teaching and learning processes.
4. Secondary school teachers should undergo training in computer application so that they can fully utilized JITT method in teaching their students.
5. When utilizing JITT method, teacher should act as facilitators or knowledge in order to maintain the students-centred nature of the method.

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## Appendix

### Test Blue Print for Constructing of JIFAAT

Content Area	Knowledge 40%	Comprehension 30%	Application Analysis Synthesis Evaluation 30%	Total No of Test Items 100%
Trading accounts 30%	4	2	2	8
Profit & loss account 30%	4	1	3	8
Trial balance 20%	3	3	1	7
Balance sheet 25%	3	2	2	7
Total Number of items 100%	14	8	8	30