EFFECTS OF JUST IN TIME TEACHING AND ACHEIVEMENT OF STUDENT IN BASIC TECHNOLOGY AT JUNIOR SECONDARY SCHOOL

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Abstract

This study evaluated the effects of Just in Time Teaching Method (JTTM) on students' cognitive achievement and interest on secondary school Basic Technology. The study also sought the effects of JTTM as well as the interaction effects of JTTM on students' achievement and interest in Basic Technology. The cognitive achievement of students assessed with JTTM was compared with those of students assessed with Lecture Method (LM). To carry out the study effectively, four research questions and six hypotheses were formulated and tested. Many related literature were reviewed. A quasi experimental design, specifically the non-randomized control group pretestposttest design involving two groups – the control group and experimental group was used in this study. 6125 (JS3) students who offered Basic Technology in 2015/2016 academic year in Suleja Education Zone of Niger SLMe formed the population of this study. The sample for the study consisted of 41 Junior Secondary three (JS3) students of two co-educational secondary schools doing Basic Technology. The two-co-educational secondary schools were randomly drawn using balloting from four co-educational schools offering Basic Technology in Suleja Education Zone of Niger SLMe. Two intact classes were used for the study. In each of the sampled schools, all the JS3 students in the intact class randomly selected belonged to one group – either the experimental (JTTM) or control (LM)) group and thus received the same treatment. Two instruments, the Basic Technology Achievement Test (BTAT) and the Basic Technology Interest Inventory (BTII), were developed and validated. An internal reliability consistency of BTAT was found to be 0.75 using Kuder Richardson formula 20(K – R20) and that of BTII was 0.85 using Cronbach Alpha. The BTAT and BTII were administered as pretest to the two groups. Treatment lasted for one month of 12 lesson periods for each group. After the treatment session, the same instruments were rearranged and re-administered as posttest to the same subjects. The data obtained were analyzed using Means and Standard Deviation for research questions; while analysis of covariance (ANCOVA) was used in testing the hypotheses at 0.05 level of significance. The result of the analyses indicated that the effect of JTTM on students' achievement and interest in Basic Technology was significant Gender was not a significant factor on students' academic achievement and interest in Basic Technology. The interaction effects of JTTM on students' achievement and interest were not significant. Thus, it is recommended that Basic Technology teachers should adopt the use of JTTM in assessing students since it seemed to be more effective in improving students' achievement and interest in Basic Technology. It is also recommended that the government should organize workshops, conferences and seminars to train teachers on the use of JTTM. Finally, the limiLMions of the study and suggestions for further research were emphasized.

Keyword; Teaching, achievement, basic technology

Introduction

Just-in-time teaching (JITT) is an innovative method that enables faculty to increase interactivity in the classroom and encourage student in learning. By creating a feedback loop between students' work at home and the classroom setting, time on task is improved in both quality and quantity. The pace of technological development in the world especially in this twenty first century unparalleled. It is inevitable that such pace of development with its attendant novelties would introduce changes in the field of education. Due to this development, teachers to introductory technology are increasingly facing serious instrument challenges as the diversity of students within each classroom continues to widen. Obiekwe (2008) observes that within each classroom, student of a wide academic range with different labels such as gifted. Fast learners, average learners, slow learners and below average learners all face their teacher daily with full hope that their needs will be met. The present methods of teaching introductory technology and other pre-vocational subjects are expected to develop. Consequently, the instructional methods subjects are based on the behavioral learning theories which according to Campbell and Hessan, Kareem, Bala& Abba (2016), does not equip teachers with an adequate knowledge of the human intellect and interest which they are expected to develop. Consequently, the instructional techniques adopted by most teacher do not seem to adequately address the diverse learning styles and preferences of the students (Usman, Hassan, Malk& Musa (2015).

Also, the conventional method of teaching and assessment only determines mathematical capability aspects of student' abilities are catered for, therefore making it difficult to measure performance in other areas of such skills. It also observed that the conventional teaching methods do not lay much emphasis on collaborative, project bases and active learning as well as authentic instruction and student' self-assessment (Owodunni, Igwe& Hassan (2014). The poor instructional method of teaching partly contributed to the students poor performance in introductory technology in the Junior Secondary Certificate Examinations in recent years. (Umar, Idris& Hassan (2016), Abakpe, (2011) to mention but a few. These poor results also affect the JSS graduates in their workplace when employed. Since there is no documented research on JTTM in Introductory Technology, this research therefore solicits a study to answer the question. What are the effects of JTTM based instructional approach on the students interest in Introductory Technology?

The effectiveness of Science and Technology teaching and learning is strongly depend on perceptions of the teacher towards his teaching and the teacher teaching strategies according to (Mandor, 2002) also believed that teachers perceptions reinforces teacher's decision making. Teaching cannot be transformed until teachers have positive perceptions about the teaching and learning of Science and Technology (Aze, 2005).

A lot of literatures have been documented about Science and Technology teachers' perceptions because recommendable attentions have been given to the perceptions they hold about their teaching. Hyokyaa (2013) also stated that data collections about Science and Technology teachers teaching from students/leaners provide a valuable result since their opinions are "highlighted by demanding and exciting skill that allow them to perceive learning and teaching manners more very well than their Science and Technology teachers". Hassan, Usman, Abdulkadir, Mohammed &Ajiya (2016) explained that the students/learners perceptions towards the Science and Technology teachers teaching influence the effectiveness of teaching and learning of Science and Technology positively and it provides a meaningful and fruitful suggestion for improvement of their Science and Technology teachers practice. Ezeudu (2011) further stated that the students/learners will developed a clear insight of the idea that is being offered by their Science and Technology teachers if they perceive the teacher classroom condition to be cooperative rather

than competitive. According to Cyri (2013) also argued that if the students perceived their Science and Technology teachers to be highly supportive and pave way for them to plays an essential part in teaching and learning activity of Science and Technology, they will established more positive attitude towards the teaching.

The purpose of this study is to find out the effects of JTTM on students' academic achievement and interest in Basic Technology Specifically the study seeks to:

- Compare the mean achievement scores of Junior Secondary three (JS3) students exposed to Just in Time Teaching Method and Lecture Method on a Basic Technology Achievement Test (BTAT).
- Find out whether differences exist in the mean achievement scores of male and female students exposed to Just in Time Teaching Method and Lecture Method in Basic Technology Achievement Test (BTAT).
- Compare the mean interest scores of students exposed to Just in Time Teaching Method and Lecture Method in Basic Technology Interest Inventory (BTII).
- Find out whether differences exist in the mean interest scores of male and female students exposed to Just in Time Teaching Method and Lecture Method in Basic Technology Interest Inventory (BTII).

The following four research questions were posed to guide the research.

1. To what extent would any of the two Lecture Method, Just in Time Techning Method (JTTM) and Lecture Method (LM) enable students to have higher academic achievement as indicated by their mean scores in Basic Technology Achievement Test (BTAT)?
2. Which group, male or female students has higher academic achievement as indicated by their mean scores in BTAT?
3. Which group of students, those assessed with JTTM or those assessed with LM showed greater interest in Basic Technology as indicated by their mean scores in Basic Technology Interest Inventory (BTII)?
4. For male and female students, which group showed greater interest in Basic Technology as indicated by their mean scores in the BTII?

The following null hypotheses are put forward in this study to be tested at $p < 0.05$ level of significance.

Ho_1: There is no significant difference in the BTAT scores of students exposed to Peer Assessment and those exposed Teacher Lecture Method.

Ho_2: There is no significant difference in the mean BTAT scores of male and female students exposed to Just in Time Teaching Method and those exposed to Lecture Method.

Ho_3: There is no significant difference in mean interest scores of students exposed to Just in Time Teaching Method and those exposed to Lecture Method as determined by the use of BTII.

Ho_4: There is no significant difference in the mean interest scores of male and female students exposed to Just in Time Teaching Method and those exposed to Lecture Method as determined by the use of BTII.

Ho_5: There is no interaction effect of gender and Lecture Method on the achievement of students in Basic Technology as measured by their mean achievement scores in BTAT.

Ho_6: There is no significant interaction due to exposure to Lecture Method and gender as measured by their mean interest scores in the BTII.

Methods

This study adopted a quasi-experimental research design which, according to Ygwuanyi (2015), is an experiment where randomization of subjects of experimental and control groups is not possible.

It is a non-equivalent pre-test post-test control group design. This is considered appropriate because, according to Akalonu (2010), there will be no randomization of the subjects into treatment and control groups. It controls the internal validity threats of the initial group equivalence and researcher's selection bias. Intact classes were used to avoid disturbing the normal classes in terms of classroom schedule. The design is illustratedthus:

The study was carried out in Suleja in Niger State the target population for this study consists of all the 6125 JSS III Students in the 52 Secondary schools in Suleja Niger State.The sample for this study was made up of 41 JSS III Students. The study adopted multi-stage sampling technique to select the sample for the study.

First, a purposive sampling technique was used to select two JSS III schools from Suleja Niger State. The purposive sampling technique was used based on the criteria that:

1. The school was a publicschool
2. The teachers possessed the same professionalqualifications.

Then, simple random sampling technique was used to assign the schools to either the experimental group or the control group.

Two instruments were used for the study. They are the Basic Technology Achievement Test (BTAT) and the Basic Technology Interest Inventory (BTII). These were developed by the researchers and were used for data collection. The instruments were used for the pre-test. The same instruments used for pre-test were used for the post-test. However, the items used for the post-test were reshuffled.

The Basic Technology Achievement Test (BTAT) is a teacher made achievement test constructed from the Basic Science and Technology curriculum for JSS III. The test items were generated by the researcher. The BTAT is a Thirty (30) items multiple choices

Face and content validity was established for the Basic Technology Achievement Test (BTAT) by presenting it to five experts – one in Science Education and industrial and Technology Education Department Federal University of Technology Minna.

The result obtained from trial testing was used to determine the reliability coefficient for BTAT. The internal consistency reliability coefficient was determined using the K-20 (Kuder Richardson) procedure. The calculated K-R20 BTAT is 0.75. The internal consistency was considered high enough. To test for stability, the instrument was re-administered to the same 20 Students. Scores from the two tests were calculated using Pearson Product Moment Correlation Coefficient. The calculated Pearson is 0.69. This was considered good enough. The test of stability became necessary since the BTAT would be used for both pre-test and post-test in view of the researchdesign.

For the Basic Technology Interest Inventory (BTII), Cronbach Alpha reliability method was used to test the internal consistency. Cronbach Alpha was applied for tests that are not dichotomously scored. Internal consistency reliability BSTAT of 0.85 was obtained. This was considered high enough.

Pre-test on both BTAT and BSTII was administered to the Students in the experimental and the control groups prior to the commencement of treatment. That was done by the class teachers in charge. The scores of the pre-test served as a covariate to the Students' post-test scores.The Post-test on BTAT (which was the reshuffled version) and the post-test on BTII were administered to the experimental and control groups immediately after the teachingexercise.

The data collected from the administration of the tests were analyzed in line with the research questions and hypotheses using Mean, Standard Deviation and Analysis of Covariance. The Mean and Standard Deviation were used in answering the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses at $P < 0.05$ level of significance.

Results

Research Question 1:

To what extent would any of the two Lecture Method, Just in Time Teaching Method (JTTM) and Lecture Method (LM) enable students to have higher academic achievement as indicated by their mean scores in Basic Technology Achievement Test (BTAT)?

Table 1: Means and Standard deviation of Pre-test and Post-test scores of students in BTAT by treatment and gender

Treatment		Pretest Male	Pretest Female	Overall Mean	Posttest Male	Posttest Female	Overall Mean
Experimental (JTTM)	Mean	41.69	45.83	43.76	59.67	63.48	61.58
	SD	14.98	14.07	14.52	12.07	12.50	12.28
	N	58	65	123	58	65	123
Control (LM))	Mean	43.33	46.97	45.15	46.61	49.73	48.17
	SD	13.96	13.32	13.64	12.79	8.90	10.85
	N	43	75	118	43	75	118

The overall mean post-test score of the students taught using Just in Time Techning Method (JTTM) was 61.58 with standard deviation (SD) of 12.28. The group taught using Lecture Method (LM) had an overall mean post-test score of 48.17 with SD of 10.85. The difference between the experimental group and control group was 13.41. This suggested that students assessed with JTTM have higher academic achievement than students assessed using LM.

Research Question 2:

Which group, male or female students, has higher academic achievement as indicated by their mean scores in BTAT?

With regards to influence of gender in Table 1, the male students taught with JTTM had a mean posttest score of 59.67 with a standard deviation of 12.07 while the female students had a mean posttest score of 63.48 with a standard deviation of 12.50. Also the male students in the control group (LM)) had a mean posttest score of 46.61 with a standard deviation of 12.79 while their female counterparts had a mean posttest score of 49.73 with standard deviation of 8.90. The differences in the mean scores 2.81 for JTTM and 3.12 for LM were in favour of the females and this appears to indicate that female students scored higher than the males in BTAT.

Research Question 3:

Which group of students, those taught using Peer Assessment Technique or those taught using Teacher Assessment Technique showed greater interest in Basic Technology as indicated by their overall mean scores in Basic Technology Interest Inventory (BTII)?

Table 2: Mean and Standard Deviation (SD) of Pre and Post-test scores of students in BTII by treatment and gender

Treatment		Pretest Male	Gender Pretest Female	Overall Mean	Posttest Male	Gender Posttest Female	Overall Mean
Experimental (JTTM)	Mean	45.36	48.92	47.14	56.28	73.06	64.67
	SD	12.60	11.76	12.18	11.11	16.71	13.91
	N	58	65	123	58	65	123
Control LM	Mean	46.23	49.35	47.79	49.19	50.53	49.86
	SD	13.40	11.71	12.55	11.87	10.26	11.06
	N	43	75	118	43	75	118

Table 2 showed that the students assessed using JTTM recorded higher overall mean interest score of 64.67 with a standard deviation (SD) of 13.91 while students taught using LM had a less overall mean interest score of 49.86 and a SD of 11.07. It seemed that the experimental group (JTTM) showed more interest in Basic Technology than the control group (LM) as indicated in their overall mean interest score in BTII.

Research Question 4:

For male or female students, which group showed greater interest in Basic Technology as indicated by their overall mean scores of BTII?

The post interest mean score of the female students in the experimental (JTTM) group was 73.06 with a SD of 16.71 while that of male students was 56.28 with a SD of 11.11. On the other hand, the post interest mean score of female students in the control group (LM)) was 50.53 with a SD of 10.26 while that of the males was mean interest score 49.19 and a SD of 11.87.

In order to make decision on students' academic achievement based on the use of JTTM and LM in teaching secondary school Basic Technology language, hypothesis 1 was tested.

Ho_1:   There is no significant difference in the mean BTAT scores of students exposed to Just in Time Teaching Method and Lecture Method

Table 3: Analysis of Covariance (ANCOVA) of students' overall Post Achievement mean scores in BTAT (Assessment Technique and Gender)

	Sum of squares	Df	Mean square	F calculated	Sig. of F	F table
Corrected model	28633.34	4	7158.34	125.71	.00	
Intercept	16343.68	1	16343.68	287.02	.00	
Pretest	17603.35	1	17603.35	309.14	.00	
Sex	65.80	1	65.80	1.16	.28	3.96
Treatment	11720.53	1	11720.53	205.83	.00	3.96
Sex x treatment	2.01	1	2.01	.04	.85	3.96
Error	13438.59	236	56.74			
Total	778375.00	241				
Corrected Total	42071.93	240				

The F calculated for Lecture Method in BTAT was 205.83 at the 0.05 level of significance and 236 degree of freedom (df) while the F critical value was 3.96. Since F calculated (205.83) was greater than f critical (3.96), the decision was to reject the null hypothesis. This implies that there is a significant (P<0.05) difference between the two Lecture Method (JTTM and LM) as measured by the students' mean BTAT scores using Analysis of Covariance (ANCOVA). This appears equally to suggest that the early observed difference between the means of the two groups was not attributed to chance error but due to the treatment.

Ho$_2$: There is no significant difference in the mean BTAT scores of male and female students exposed to Just in Time Teaching Method and Lecture Method .

Table 9 revealed that gender is not a significant factor on students' academic achievement in BTAT. The F calculated for gender was 1.16 against a table value of 3.96 for 1df for numerator and 236 df for denominator at the 0.05 level of significance. Therefore, the null hypothesis of no significant difference on the effect of gender in the mean achievement of male and female students was upheld. This meant that though female students appeared to achieve more than their male counterparts, the achievement was not sLMistically different.

Ho$_3$: There is no significant difference in the mean interest scores of students exposed to Just in Time Teaching Method and Lecture Method as determined by the use of BTII.

Table 4: Analysis of Covariance (ANCOVA) of students' overall Post-Interest mean scores in BTII (Lecture Method and Gender)

Source of variation	Sum of squares	df	Mean square	F calculated	Sig. of F	F table
Corrected model	35421.46	4	8855.36	5.44	.00	
Intercept	12070.25	1	12070.25	7.41	.01	
Pretest	12996.91	1	12996.91	7.98	.01	
Sex	2820.71	1	2820.71	1.73	.19	3.96
Treatment	13343.06	1	13343.06	8.19	.01	3.96
Sex x treatment	3323.81	1	3323.81	2.04	.15	3.96
Error	384387.61	236	1628.76			
Total	1223588.00	241				
Corrected Total	419809.06	240				

The F calculated for assessment technique was 8.19 against the critical value of 3.96 at the 0.05 level of significance, 1 df for numerator and 236 df for denominator. Since the calculated value exceeded the critical value, the null hypothesis of no significant difference in the mean interest scores is rejected. It is therefore inferred that the effect of Just in Time Teaching Method (JTTM) on students' interest in Basic Technology language is significant.

Ho$_4$: There is no significant difference in the mean interest scores of male and female students exposed to Just in Time Teaching Method and Lecture Method as determined by the use of BTII.

Table 4 revealed that gender was not a significant factor in students' overall interest in Basic Technology language. The F ratio calculated was 1.73 against a table value of 3.96 at the 0.05 level of significance, 1 df for numerator and 236 df for denominator. Therefore the null hypothesis of no significant difference on the effect of gender in the mean interest score of male and female students was not rejected. This meant that the female students' interest was not sLMistically different from the male students' interest.

Ho$_5$: There is no significant interaction effect on gender and assessment technique on the achievement of students in Basic Technology language as measured by their mean achievement scores in BTAT

The Analysis of Covariance (ANCOVA) of the students' overall achievement scores presented in Table 9 showed that the interaction effect due to assessment technique and gender (sex x treatment) was not significant. The calculated F-ratio of 0.04 was less than the table value of 3.96 for 1 df for numerator and 236 df for denominator at the 0.05 level of significance. Therefore the null hypothesis of no significant interaction effect of gender and assessment technique was upheld.

Hypothesis 6:

Ho$_6$: There is no significant interaction due to exposure to Lecture Method and gender as measured by the mean interest scores in the BTII.

As could be seen from table 4, the interaction due to assessment technique (JTTM) and gender was not significant. The calculated F-ratio was 2.04 against a critical value of 3.96 at the 0.05 level of significance, 1 df for numerator and 236 df for denominator. This then meant that the effect of assessment technique was consistent across the levels of gender. Therefore the null hypothesis was not rejected.

Discussion of Finding

The result of the research question revealed that female students had a higher mean score on achievement than their male counterparts but how significant is the difference in the achievement of males and females. Evidence from the analysis in table 3 confirmed that the difference was insignificant. Though the female students appeared to achieve more than their male counterparts, the difference in achievement was not sLMistically significant. Hence gender was not a significant factor in this study. This finding could be as a result of learners' much involvement in the learning. It could also have resulted from the fact that JTTM was new to all the students. So all the students, irrespective of gender were excited with JTTM. Subsequently each student performed as best as he could. Hassan (2016), Udeme – Obong (2003) and Ogundokun&Adeyemo (2010) had similar findings. They found out that gender had no effect on the achievement of students in Basic Technology learning instructions like the Contextual Teaching Method (CTM), CBIM and CALL. Nevertheless, some contradictory findings were reported in gender related differences in language achievement. Amoo&Rahman (2004) and Robert, Hassan &Nwankwo (2016) observed that there was gender discrimination in favour of girls in CALL activities. They explained that this would seem to be connected with the fact that girls have more positive attitudes to language learning than boys. Lovatte and Broaderick in Hassan, Gimba, Abdulkadir, Umar&Adio (2016) in their study, found out that girls achieved better in mixed-ability pairing than in like-ability paring.

The conclusion of this finding is that though gender has no sLMistical significant effect on students' achievement in Basic Technology language grammar, gender differential was manifested in favour of girls'.

The study revealed that gender was not a significant factor in students overall interest in Basic Technology language. Though the female students tended to show more interest than their male counterparts, their better interest ratings were not sLMistically different. This finding is in consonance with that of Akalonu (2001) in which he reported that students' interest in Basic Technology was significantly independent of sex. However, it appeared to contradict the findings of Undeme – Obong (2003), Uamr, Idris& Hassan (2016) and Mandor (2002) who reported

sLMistically significant effect of gender on students' development of interest in chemistry and Biology respectively. They noted that female students showed greater interest than male students.

Some studies on gender influence on students' interest in arts subjects were of the opinion that girls were inclined to arts than boys. Boys, as it was reported by Eze (2005) and Obiekwe (2008), are more exposed to scientific activities very early in life than girls. Moreover, they are encouraged to enter for science related professions like engineering and technology while girls go for Biology, Home Economics, Basic Technology and other allied subjects. In this study, though female students manifested greater interest than their male counterparts, it was very minimal and therefore negligible because it was not sLMistically significant. It was therefore upheld that gender was not a significant factor in students' interest in Basic Technolog . The result of this study has shown that given equal opportunities and equal access to education for both male and female, boys would develop interest in arts subjects like Basic Technology , Igbo and Literature. Girls would as well develop interest for physical sciences like Chemistry, physics and mathematics. This would imply that the use of JTTM might reduce or eliminate gender related differences in students' interest towards Basic Technology language.

The interaction effect of treatment and gender on students' overall cognitive achievement in Basic Technology was not significant (Table 3). This is in agreement with the findings of Ygwuanyi (2015) and Cyril (2013) in which they reported that the combined effect of assessment technique and gender on overall cognitive achievement in chemistry and geography respectively were not significant. However, this disagrees with Akalonu (2001) who found a significant interaction effect between gender and assessment technique on students' achievement in chemistry.

On the combined effect of peer assessment technique and gender on students' interest in Basic Technology, there was no significant effect. This conformed with Abakpe (2002) who found the combined effects on JTTM and gender on students' interest towards Geography not significant. This meant that the efficacy of JTTM on students' interest was consistent across sex levels.

From the findings of this study, it could be deduced that with an innovative assessment technique like JTTM in which male and female students have shown equal interest, they could equally attend to high standard in Basic Technology achievement.

Conclusion

The study had shown that JTTM has significant effect on students' cognitive achievement and interest in Basic Technology. The JTTM enabled students to learn more Basic Technologygrammar than their counterparts who were taught using the LM. The JTTM appeared to be more efficacious than LM in engendering the aforementioned criterion measure.

The influence of gender on cognitive achievement in Basic Technology was not significant though the female students tended to exhibit superior achievement over their male counterparts. The study indicated no significant gender influence on interest in Basic Technology but the female students tended to show more interest towards the subjects.

The combined effects of JTTM and gender on students' cognitive achievement and interest were not significant. Both male and female students demonstrated equal level of achievement and interest in the JTTM.

Recommendations

The following recommendations were made in view of the foregoing implications of the findings of this study:.

- Since JTTM has been found to enhance the quality of achievement and interest in Basic Technology, Basic Technology teachers should be encouraged to employ it more in the

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teaching of the subject. By so doing, the students' achievement and interest in the subject could be increased.

- The fact that high mean achievement and interest scores were recorded through JTTM, calls for junior secondary school teachers to acquaint themselves with the distinctive characteristics of this technique with a view to adopting and using it for enhancing students' affective and cognitive outcomes of learning. This could be done through seminars, conferences and workshops organized by government and professional bodies like Nigerian Association of Teachers of Technology (NATT).
- Innovations like JTTM demand well-trained personnel and make training and retraining of staff imperative. Heads of teacher training tertiary institutions should include JTTM as one of the methods of teaching and should impart the usage to the student teachers.
- There should be no discrimination or gender factor in any teaching and learning situation. Both the male and female learners should be made to see themselves as co-learners and discrimination against sex must be sincerely avoided.
- Having found that JTTM enhanced students' interest in Basic Technology, to sustain such interest in Basic Technology, Basic Technology teachers and educational administrators should introduce JTTM into class works to alternate or supplement the usual teacher assessment technique.
- The Ministry of Education in Nigeria should organize seminars, workshops and conferences for Basic Technology teachers on how to use JTTM in teaching and evaluating students of Basic Technology. The same ministry of education should consider adopting JTTM for the purposes of promoting gender equality in Basic Technology classroom.

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