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Effectiveness of Space Model on Cognitive Behavioral Psychotherapy Among Primary School Tutors Test Items Construction Skills in Adamawa State, Nigeria

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Abstract

Space model is a cognitive behavioural model that is used for assessment and intervention in counselling psychotherapy, coaching, stress and anxiety management in test items construction skills which the focused of this study to assessed effectiveness of space model on cognitive behavioral psychotherapy among primary school tutors test items construction skills in Adamawa State, Nigeria. Two research question and its corresponding null hypotheses guided the study. Quasi experimental research design of non- randomized pretest–posttest control group of design. The population of the study comprised all 3,444 primary school tutors and 143 were used as a sample size for this study using purposive random sampling techniques. The experimental group comprised of 74 tutors, 40 males and 34 females whereas control group are 69 tutors, 39 male and 30 female. An instrument for data collection entitled "Test Construction Skills Inventory" (TCSI) contained 40-items anchored on a 4-point Likert Scale. TCSI was validated which yielded 0.81 validity index" and 0.80 reliability index. Means, standard deviation was used for answering research question and ANCOVA was used for testing hypotheses at 0.05 level of significant. The findings revealed that, there is a significant effect of SPACE Model on primary school tutors test items construction skills using on CBPT and there is no significant different in the effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT. Based on the findings it was recommendations that, primary school tutors should use the knowledge and skills gained acquired during CBPT intervention to construct classroom test items, continuous assessment and examination periodically among others.

Keywords: *SPACE model, cognitive behavioral psychotherapy, primary school tutors, test items construction skills*

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Background to the Study

SPACE model is a cognitive behavioural model that is used for assessment and intervention in counselling, therapy or psychotherapy, coaching, stress and anxiety management (Edgerton and Palmer, 2005). SPACE has been adapted to different languages and cultures including Portuguese (Dias, Edgerton and Palmer, 2010) and Polish (Syrek-Kosowska, Edgerton and Palmer, 2010). The SPACE model was developed by Edgerton and Palmer, (2005), together they co-authored the first article on SPACE in 2005. Scholars became interested in the SPACE model as it could be used within counselling, training and stress management and it can be applied in teaching learning processes where the situation is faced with discouraging results due to weak cognitive behavioral therapy or psychotherapy. According to Beck (2011) described cognitive behavioral psychotherapy (CBPT) as a psycho-social intervention that aims to reduce symptoms of various mental health conditions, primarily depression and anxiety disorders. CBPT was developed by Beck (1976) and theorized that human cognitive, behavioral, and emotional reactions largely depend on how the person interprets and processes events. If the interpretation of the event reflects reality accurately, the beliefs, responses, and feelings of the person will be adaptive, but if the individual processes the event inaccurately, such person is likely to develop dysfunctional thoughts. Field, Beeson, and Jones (2015) CBPT focuses on challenging and changing cognitive distortions (such as thoughts, beliefs, and attitudes) and their associated behaviors to improve emotional regulation and develop personal coping strategies that target solving current problems(Beck, 2011), Benjamin, Puleo and Settipan i(2011). Though it was originally designed to treat depression, its uses have been expanded to include the treatment of many mental health conditions, including anxiety, substance use disorders, marital problems, and eating disorders (McKay, Sookman, Neziroglu, Wilhelm, Stein, Kyrios, 2015 and Zhu, Zhang, Jiang, Li, Cao, Zhou, et al. 2014). CBPT includes a number of cognitive or behavioral psychotherapies that treat defined psychopathologies using evidence-based techniques and strategies. CBPT is based on the combination of the basic principles from behavioral and cognitive psychology and teaching learning processes.

Teaching is a noble profession that demand skillful and innovative teachers that would cultivate the right value, attitudes and knowledge to the pupils especially at the primary level of education but however, over the years, most of the primary school tutors are undernourished in constructing test items for assessment of pupils' cognitive level of achievement. Test is one out of many educational tools used for measuring behavioral or learning outcomes. It is a set of questions (items) with appropriate responses and constitutes the major building blocks of learning outcomes and instruction. Test is seen as a standard procedure for estimating a sample of behavior from a specified domain (Crocker and Algina, 2008). A structured situation comprising a set of tasks or questions to which an individual is expected to respond is test (Nworgu, 2015). A test is generally used as an assessment tool for obtaining information about students' learning. The quality of a teacher-made test is closely linked with its ability to provide the kind of information needed regarding students' performances. A well-written test allows the teachers to accurately and consistently measure students' mastery of specific contents taught in class. Likewise, poorly construction of test items can lead to inaccurate measurements of learning and provide false information regarding student performance as well as instructional effectiveness (Close in Ngozi, Chika, and Aloysius, 2013).

However, this inaccurate measurements or error occurred in three categories: the first "errors inherent in the instrument, "errors in the use of the instrument and "errors emanating from the responses of test takers' (Anikweze, in Galle and Sakks, 2018). Crooker and Algina (2008) further gave a description of the test to be a standard procedure for obtaining a sample of behaviour from a specified domain. It should be made clear at this point that testing is a key component in educational assessment. In testing what students know or have learnt in an area of study, well drafted test items should be used. Tamakloe, Amedahe and Atta as cited in Frank, Isaac, and Francis (2019) further described a test as a device or procedure for measuring a sample of an individual's behaviour in a specific learned activity or discipline. These tests are normally constructed and administered to pupils after a period of instruction under the auspices of a tutor. Considering the sensitive role that information from a test play in making educational decisions for pupils as well as management, it is important to say that both test developers/tutors and users must make conscious effort to improve the validity and the reliability of the test in order to get objective information that approximate predict the individual's pupils true score/characteristic, which the test developer/tutors seek to estimate and exhibited competent skills. Skill according to Alison(2020) is the knowledge, abilities, and experience needed to perform a job. Alison added that the skills required to solve problems are known as analytical skills. Analytical skills refer to the ability to collect and analyze information, solve problems, and make decisions. Alison (2019) Test construction skills include the competencies needed for developing quality tests based on stipulated principles of test construction. Some of the competencies are: objectivity, communicative, item validation skills, and skills for applying appropriate strategies for ascertaining the validity and reliability of test instruments (Ali cited in Moses et'al, 2021).

Regrettably, most of the primary schools tutors in test construction responsibility of have been account poorly as primary school pupils' achievement in class test/examinations is questionable in Nasarawa state communities. According to Ebinye (2001) that test construction role of teachers has been reported as a main source of anxiety, especially with teachers with few years of teaching experience. He argued that, this anxiety is largely stems from inadequate test construction skills of these teachers and Ololube (2008), which assessed the test construction skills of teachers in Nigeria, found poor test construction skills among non-professional teachers. Others scholars such as Kazuko (2010), Hamafyelto, Hamman-Tukur and Hamafyelto (2015) and Galle (2019) also argued that test construction among teachers is not encouraging as a result of inexperienced, non professionalism, anxiety and inadequate knowledge used of the operational chart for construction and development of valid and reliable test item in agreement with principles of test construction. This could result to poor judgmental and placement of pupils academic achievement in primary schools in Adamawa state, Nigeria. For instance, Quansah and Amoako (2018) found that SHS teachers in the Cape Coast Metropolis have a negative attitude towards test construction. The authors specifically found a poor attitude of teachers in the planning of test, item writing, item review and assembling of the items. Quansah and Amoako (2018) concluded that this attitude of teachers had an effect on the quality of test used for assessing students. It is of essence to state that the poor attitude might not be due to their inadequate skills but also from the fact that some teachers see test construction as a burden.

Exploring the test construction skills of teachers is significant if objective and accurate information are to be gathered from students in the teaching and learning process. Galle (2019) findings revealed that there was a significant mean difference in ability between professional teachers and non-professional teachers of Economics in test construction and there was a significant mean difference in ability between public school teachers and private school teachers of Economics in content validity among others. Another study by Moses, John, Chinedu, Zudonu, Basil, Patricia, Catherine, Ngozi, Ifeyinwa, Chikodili, and Ifeyinwa, (2021) found that cognitive behavioral active engagement training had a significant effect on participants' test items construction scores as measured by test construction skills inventory at posttest, first and second follow-up stages. Over the years, teacher test construction skills have been an obstacle to the students' achievement. This is because the lack of test construction skills by teachers might result in the false assessment of students' achievements, poor grammar/sentences, and lack of proper monitor by the evaluators among others. These skills help teachers to structure items to elicit clear and concise answers from students; construct appropriate test for learners of different ages, abilities, and gender; set tests so that students can finish within the range of time and do not grow scared of tests but reversed is the case. The main objective of this study based on the effectiveness of SPACE Model on cognitive behavioral psychotherapy(CBPT) on primary school tutors test items construction skills in Adamawa State, Nigeria. Specifically, the following research questions and null hypotheses were used to this study thus:

1. What is the mean effect of SPACE Model on primary school tutors test items construction skills using on CBPT and CG?
2. What is the mean effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT and CG?

Ho1: There is no significant effect of SPACE Model on primary school tutors test items construction skills using on CBPT and CG

Ho2: There is no significant effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT and CG.

Material and Methods

Design

The study used quasi experimental research design of non- randomized pretest–posttest control group of design. This is an experimental design which uses 1 independent variable with 2 levels in a single experiment and the effect of each the level of the independent variable is measured using different group of participants. The researchers manipulated one levels of an independent variable of the study (CBPT) whereas the control group (CG) was not manipulated. Subjects were randomized into experimental and control groups.

Population and Sample

The population of the study comprised all 3,444 primary school tutors and 143were used as a sample size for this study using purposive random sampling techniques. The experimental group comprised of 74primary school tutors from Lady Atiku and future stars academy primary schools Yola, 40 males and 34 female whereas control group are 69primary school

tutors from Damilu primary school Jimeta Yola and Elkanemi Islamic theology primary schools Yola, 39 male and 30 female. The two primary schools tutors were combined to formed experimental group while the other two schools stand for control group.

Participants (Tutors) Ethical Considerations

The Adamawa State Ministry of Education Research Department in collaboration with the Quality Assurance Department granted the researchers authorization to conduct the workshop training, This workshop include pair or triad work to practice the SPACE model on test items construction adopted by Edgerton and Palmer (2005). Consent form constructed by the researchers and it was assigned to the primary school tutors filled aiming at sampling. The tutors were assured of their privacy of information with regarding test items construction skills (TICS). The researchers made the following inclusion criteria were used: practicing primary school tutors with Teachers Registration Council of Nigeria (TRCN), tutors' scheme of work for the subject(s) they are teaching regardless of the levels of academic qualification,

Instrumentation

The researchers developed an instrument for data collection entitled "Test Construction Skills Inventory" (TCSI) contained 40-items anchored on a 4-point modified Likert Scale with the following options: strongly agree (SA) = 4, agree (A) = 3, disagree (D) = 2, and strongly disagree (SD) = 1. Samples items from TCSI include the following: "list out the content covered for the term before constructing test items from content (topics)"; "Prepare a test blueprint or operational chart as a guide in the test construction"; "Consult current and recommended standard text books in the subject of specialization for guide"; "States out very clear instructions to guide the test takers"; "Write test items so that both high, average and low learners/pupils can understand"; "Ensured that the test items are measuring the cognitive domain of educational objectives categorical, was validated by expert's which yielded 0.81 validity index". The internal consistency of TCSI was reported as 0.80reliability index. The reliability results of TCSI was compared with the guidelines for interpreting alpha coefficients suggested (Ugodulunwa and Okolo cited in Galle, 2021) that "$\alpha \geq 0.9$ excellent, ≥ 0.8 good, ≥ 0.7 acceptable, ≥ 0.6 questionable, ≥ 0.5 poor, ≤ 0.5unacceptable". Therefore, the results of the reliability enabled the researchers to use the TCSI for both pretest and posttest, since the correlation was considered highly significant and stable across gender but sensitive to years of experience, as such, it could be used to assess the test construction skills of teachers.

Training Manual Guide on Test Construction

The researcher's developed Training Manual Guide on Test Construction (TMGTC) for Cognitive Behavioral Psychotherapy (CBPT) was used to enable the research assistants to assist the participants construct good test items. TMGTC directed both the research assistants and participants on how to construct good test items. It indicates the basic principles, steps, and skills involves in the construction of test items. The training lasted for 14 sessions (7 weeks of 2 sessions per week with a time frame of 2 hours for each session making 2 8 hours all together). The research assistants adhered to the directives of the researchers during the plenary session. The researchers specifically created 1 week training for the research assistants despite they are test developer experts and supportive materials for test items construction were provided by

educational research, measurement and evaluation unit Nasarawa state university Keffi, Nigeria in collaboration with the stat ministry of education concerned.

Research Assistants
Four research assistants, 2 men and 2 women with age range of 40 to 60 years with about 10 years of teaching experience and they are skillful in test construction. The research assistants administered the TCSI for the participants. Before then,1 week training for the research assistants was conducted by the researchers lasted for 2 hours per day in plenary sessions.

Plenary Session 1: syndicate groups report was presented by research assistants toward the intention of the study using SPACE model for assessment and intervention in counselling, therapy or psychotherapy whereby all the principals of test construction techniques they were asked to list some of them as when applied teaching/learning process that would also be used for teachers. Consensus decision was formed for effectiveness to teach in their syndicate groups and as well return with the skills to teach students using "Hand-on-Activities (HA) and Jigsaw (JS)Techniques" for implementation of the study.

Plenary Session 2: Principles of test items construction was reviewed in the area of content analysis, instructional objectives, development of operational chart or table of specification, writing of items, validation and reliability of test items.

Plenary Session 3: the research assistants were given the TMGTC to master the steps involved in test items construction principles**.**

Plenary Session 4: Both the researcher and the research assistants met together for rehearsal on implementation of the experiment using TMGTC by research assistants. The justification reason for organizing the plenary sessions was to control the extraneous that may occur as result of research assistants' divergence assessment involve in the study during treatment. Guided instructional standard among the trainers and the researchers monitored the research assistants to ensure that they adhere strictly to the principle imbedded in TMGTC for this study.

Sampling Procedure
The researchers visited primary school tutors at their various schools prior to the commencement of the treatment for familiarization. TCSI was administered as pretests to the tutors in their syndicate groups by the research assistants alongside researchers monitored to evaluate the competency skills on test construction and baseline criterion acquired during plenary session training of the tutors' (participants). All the sample of 143primary tutors met the inclusion criterion were recruited as participants and dichotomized into two. 74 primary school tutors, 40 males and 34 female were assigned to experimental group using CBPT whereas 69 primary school tutors, 39 male and 30 female were assigned to control group (CG). Before assigning the groups, lottery method was employed, serial numbers of the elements "CBPT" and "CG." in the sampling frame was recorded on pieces of papers folded and mixed thoroughly before respondents were asked to pick at once without replacement. This technique

gave the respondents equal opportunity of being selected thereby, reducing the bias effect that may interfere with the validity and reliability of the study. Participant who picked "CBPT" slip was assigned to Cognitive Behavioral Psycho-Therapy group whereas those who picked "CG" were assigned to Control Group. The participants' eyes were blindfolded during screening exercise. The recruitment exercise lasted for 7 weeks. Participants in CBPT group were exposed to "CBPT for test items construction skills and those in the CG were attended to 2 weeks after completion of intervention with CBPT group. The CBPT group was further classified into 9 syndicate groups assessed by research assistance in a single large hall using Space MODEL while CG were exposed in lecture method and they were not classified into syndicate groups.

Plenary session 1st commencement and it focused on introduction of participants and research assistants, as well as the ethical rules and regulations that guided the process. The time and limits of confidentiality were established. Plenary session 2nd participants were exposed meaning of tests, test construction principles, and test items formats. Plenary session 3rd participants were exposed to task that to task focused on purposes of test, content description and analysis. Plenary session4th participants were exposed to extract instructional objectives from their core content curriculum. Plenary session 5th to 6th participants were exposed to operational hart or table of specification and how to develop it as well as item construction in groups. Plenary session 7th participants' were further exposed to test items construction using operational hart or table of specification and to types of validity. Plenary session 8th participants were trained on types of reliability estimate. Participants practice how to determine estimate of temporal stability, estimate of scorer or rater reliability, estimate of internal consistency, and estimate of equivalence in groups and did group presentations. Plenary sessions 9th, participants were trained on test administration, item analysis, selection, and serialization. Plenary sessions 10thindividual participant was exposed to test items construction and they were asked t to construct 30 items in their area of specialization. Participants were engaged in syndicate group discussion and criticism of individual work. Plenary sessions 11th and12thwas an oral evaluation of knowledge gained and skills acquired during test items construction. Hence, sample summary of TMGTC is presented in table 1.

Procedure for Data Analyses

Means, standard deviation was used for answering research question and analysis of covariance (ANCOVA) using IBM SPSS version 23 was used for testing hypotheses at 0.05 level of significant.

Table 1: Sample Summary of TMGTC

Plenary Session	Cognitive Process: Activities	Week	Time (h)	Techniques
1	Commencement of the training and it focused on introduction of participants and research assistants, as well as the ethical rules and regulations that guided the process. The time and limits of confidentiality were established. Participants were given assignment	1	2hrs	Hand-on-Activities &Jigsaw
2	Participants were exposed to the meaning of tests, test construction principles, and test items formats Participants were given assignment	2	2hrs	Hand-on-Activities & Jigsaw
3	Participants were exposed to task focused on purposes of test, content description and analysis and assignment was given	3	2hrs	Hand-on-Activities & Jigsaw
4	Participants were exposed to extract instructional objectives from their core content curriculum	4	2hrs	Hand-on-Activities & Jigsaw
5-6	participants were exposed to operational hart or table of specification and how to develop it as well as item construction in groups.	5	4hrs	Hand-on-Activities & Jigsaw
7-8	Participants were further exposed to test items construction using operational hart or table of specification and to types of validity and they were trained on types of reliability estimate. Participants practice how to determine estimate of temporal stability, estimate of scorer or rater reliability, estimate of internal consistency, and estimate of equivalence in groups and did group presentations	6	4hrs	Hand-on-Activities & Jigsaw
9-10	Participants were trained on test administration, item analysis, selection, and serialization, and exposed to test items construction and they were asked t to construct 30 items in their area of specialization. Participants were engaged in syndicate group discussion and criticism of individual work.	7	4hrs	Hand-on-Activities & Jigsaw
11-12	An oral evaluation of knowledge gained and skills acquired during test items construction	8	4hrs	Question & answer

Results

Research Question One: What is the mean effect of SPACE Model on primary school tutors test items construction skills using CBPT and CG?

Table 2: Mean Effect of SPACE Model on Tutors Test Items Construction Skills in CBPT and CG

Treatment Groups	No of Cases	Pre-test		Post-test		Accomplishment Gain
		Mean	SD	Mean	SD	
Experimental Group (CBPT)	74	23.43	4.84	30.18	5.49	6.75
Control Group (CG)	69	21.14	4.59	23.86	4.88	2.72

Table 2shows the mean effect of SPACE Model on primary school tutors test items construction skills using on CBPT and CG. The variation between the pre-test and post-test mean scores for CBPT is 6.75and 2.72 for CG as accomplishment mean gains after the

treatment syndicates groups in the training. Comparatively, result reveals that primary school tutors that where trained using CBPT had high accomplishment mean gains than their counterpart in CG (CBPT = 6.75>CG=2.72). Confirming the significant effect of SPACE Model on primary school tutors test items construction skills, null hypothesis one: there is no significant effect of SPACE Model on primary school tutors test items construction skills using CBPT and CG in Table 3 was tested using ANCOVA.

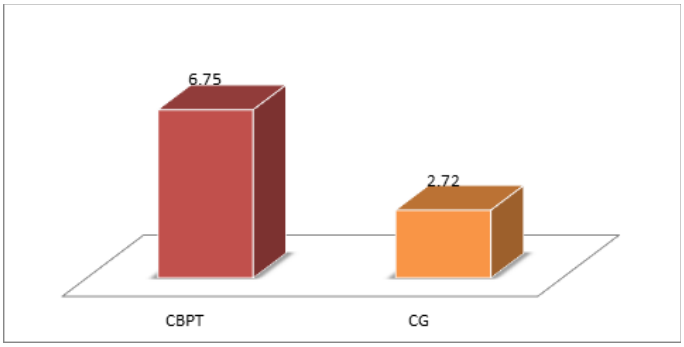
Table 3: ANCOVA Tests of Significant Effect of SPACE Model on Primary School Tutors test Items Construction skills Using on CBPT and CG

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1452.060a	1	1452.060	59.554	.000
Intercept	76.912	1	76.912	3.154	.018
Pre-testCBPT	1452.060	1	1452.060	59.554	.000
Error	3437.912	141	24.382		
Total	94165.000	143			
Corrected Total	4889.972	142			

a. R Squared = .297 (Adjusted R Squared = .292)

The result presented in table 3 shows ANCOVA test for significant effect of SPACE Model on primary school tutors test items construction skills using on CBPT and CG. (df=1, 143, F=59.5, P=.000 ($p<0.05$). This suggests a statistically significant difference in the mean effects of SPACE Model on primary school tutors test items construction skills using on CBPT and CG. This implies that the used of SPACE Model on primary school tutors test items construction skills using on CBPT was very effective over their counterpart in conventional group lecture approach. The tutors who were trained using CBPT were highly motivated during the involvement in plenary sessions and which led to the high accomplishment and impressive effort in their test items construction skills after the involvement. The accomplishment means gains of CBPT and CG primary school tutors test items construction skills is presented in bar-chart figure 1 below.

Fig. 1: Accomplishment Mean Gain



What is the mean effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT and CG?

Table 4: Means Effect of SPACE Model on Male and Female Primary School Tutors test Items Construction Skills Using CBPT and CG

Treatment Groups	Gender	No of Cases	Pre-test		Post-test		Mean Accomplishment Gain
			Mean	SD	Mean	SD	
Experimental (CBPT)	Male	40	13.43	3.66	18.81	4.33	5.38
	Female	34	13.13	3.62	18.40	4.28	5.27
Conventional (CG)	Male	39	12.14	3.48	14.87	3.85	2.73
	Female	30	12.12	3.48	14.47	3.80	2.35

Table 4 shows means effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT and CG. The result indicates that both male and female primary school tutors in experimental group (CBPT) and conventional group (CG) exhibited almost similar accomplishment before the training as reflected by their relatively closed values of pre-test mean scores of 13.43, 13.13, 12.14, 12.12 and standard deviations of 3.66, 3.62, 3.48, 3.48 for the two groups. The result also reveals that students in the two groups had relatively closed values of post-test means scores of 18.81, 18.40, 14.87, 14.47 and standard deviations of 4.33, 4.28, 3.85, 3.80. Similarly, the result shows that male and female primary school tutors that were trained using CBPT had the highest mean achievement gain 3.38 for male and 3.27 for the female while in the conventional group had 2.73 for male and 2.35 for the female respectively. Confirming the significant effect of SPACE Model on male and female primary school tutors test items construction skills, null hypothesis two: there is no significant effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT and CG in Table 5 was tested using ANCOVA

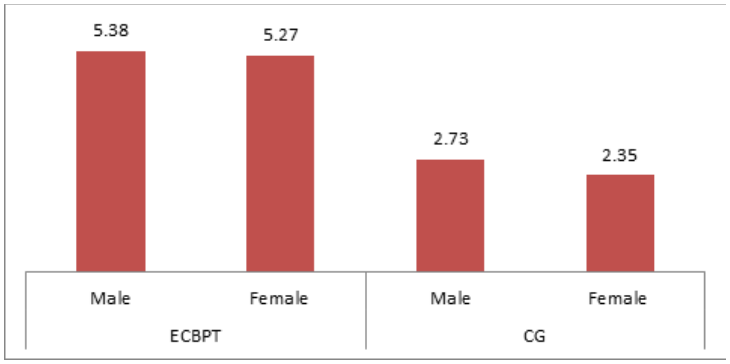
Table 5: ANCOVA Tests of Significant Effect of SPACE Model on Male and Female Primary School Tutors test Items Construction skills Using on CBPT and CG

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1452.060a	3	1452.060	58.554	.000
Intercept	76.912	1	76.912	3.154	.018
Pre-t GENDER	1452.060	1	1452.060	58.554	.000
Error	3437.912	141	24.382		
Total	94165.000	143			
Corrected Total	4889.972	142			

R Squared = .297 (Adjusted R Squared = .292)

The result presented in table 5 shows ANCOVA test for significant effect of SPACE Model on primary school tutors test items construction skills using on CBPT and CG.(df=3, 143, F=58.5, P=.000 ($p<0.05$). This suggests a statistically significant difference in the mean effects of SPACE Model on male and female primary school tutors test items construction skills using on CBPT and CG. This implies that the used of SPACE Model on primary school tutors test items construction skills using on CBPT was very effective over their counterpart in conventional group lecture approach. The male and female tutors who were trained using CBPT were highly motivated during the involvement in plenary sessions and which led to the high accomplishment and impressive effort in their test items construction skills after the involvement. The accomplishment means gains of CBPT and CG male and female primary school tutors test items construction skills is presented in bar-chart figure 2 below.

Fig 2: Accomplishment Mean Gain



Discussion of Findings

The findings of the study revealed that the primary school tutors that where trained using CBPT had high accomplishment mean gains than their counterpart in. Confirming the

significant effect of SPACE Model on primary school tutors test items construction skills, null hypothesis one was tested at 0.05 level of significant using ANCOVA revealed there is a statistically significant difference in the mean effects of SPACE Model on primary school tutors test items construction skills using on CBPT and CG. This suggests a statistically significant difference in the mean effects of SPACE Model on primary school tutors test items construction skills using on CBPT and CG. This implies that the used of SPACE Model on primary school tutors test items construction skills using on CBPT was very effective over their counterpart in conventional group lecture approach. The tutors who were trained using CBPT were highly motivated during the involvement in plenary sessions and which led to the high accomplishment and impressive effort in their test items construction skills after the involvement. The accomplishment means gains of CBPT and CG primary school tutors test items construction skills. This finings is in agreement with that of Moses et.al (2021) found that cognitive behavioral active engagement training had a significant effect on participants' test items construction scores as measured by test construction skills inventory at posttest, first and second follow-up stages. Hamafyelto, Hamman-Tukur and Hamafyelto (2015) and Galle (2019) also argued that test construction among teachers is not encouraging as a result of inexperienced, non-professionalism, anxiety and inadequate knowledge used of the operational chart for construction and development of valid and reliable test item in agreement with principles of test construction.

Finally, the sturdy raveled means effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT and CG. The result indicates that both male and female primary school tutors in experimental group (CBPT) and conventional group (CG) exhibited almost similar accomplishment before the training as reflected by their relatively closed values of pre-test mean scores and standard deviations for the two groups. The result also reveals that students in the two groups had relatively closed values of post-test means scores and standard deviations. The findings also showed that male and female primary school tutors that were trained using CBPT had the highest mean accomplishment gain while in the conventional group male and female respectively. The null hypothesis two was tested at 0.05 level of significant using ANCOVA revealed there is a statistically significant difference in the mean effects of SPACE Model onmale and female primary school tutors test items construction skills using on CBPT and CG. This implies that the used of SPACE Model on primary school tutors test items construction skills using on CBPT was very effective over their counterpart in conventional group lecture approach. The male and female tutors who were trained using CBPT were highly motivated during the involvement in plenary sessions and which led to the high accomplishment and impressive effort in their test items construction skills after the involvement. The accomplishment means gains of CBPT and CG male and female primary school tutors test items construction skills. This finings is in agreement with that of Abul-rasheed (2015) that competitive skill of male was very high in test items construction than their counterpart female. Quansah and Amoako (2018) concluded that this attitude of teachers had an effect on the quality of test used for assessing students. Hamafyelto, Hamman-Tukur and Hamafyelto (2015) and Galle (2019) also buttressed that test construction among teachers is not encouraging as a result of inexperienced, non-professionalism, anxiety and inadequate knowledge used of the operational chart for

construction and development of valid and reliable test item in agreement with principles of test construction and mostly female teachers are at the less competent.

Conclusion

Based on the findings of this study, the researchers concluded that there is significant effect of SPACE Model on primary school tutors test items construction skills using on CBPT and there is no significant effect of SPACE Model on male and female primary school tutors test items construction skills using CBPT in Adamawa State, Nigeria.

Recommendations

The researchers' made the following recommendations thus:

1. Primary school tutors should use the knowledge and skills gained acquired during cognitive behavioral psychotherapy (CBPT) intervention to construct their classroom test items continuous assessment and examination periodically.
2. SPACE model on cognitive behavioral psychotherapy (CBPT) intervention should be incorporated into teaching/learning programmes would improve tutors' skill and competency in test items construction in Adamawa state and Nigeria as a whole.

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