EFFECTS OF PROBLEM-SOLVING TECHNIQUE ON TEST ANXIETY AND ACADEMIC PERFORMANCE AMONG SECONDARY SCHOOL STUDENTS IN IMO STATE

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Abstract
This study investigated the effects of problem-solving technique on test anxiety and academic performance of secondary school students. The study adopted a quasi- experimental pre-test post-test research method. Three null hypotheses were generated and tested at 0.05 level of significance. Sixty nine students identified with high anxiety level were selected for the study. The selected samples were grouped into experimental and control groups. A Test Anxiety Scale developed by the researchers and validated was used for the study. The questionnaire was administered to identify students' level of test anxiety before and after the treatment. The experimental group was taken through six weeks of problem-solving technique. Data collected were analyzed using analysis of covariance (ANCOVA). The results revealed there was significant difference in the test anxiety levels between the two groups in the post test. Also there was improvement in the academic performance of students in the experimental group who received the problem solving technique. Based on these findings, it was concluded that problem-solving technique is effective in reducing test anxiety levels among students.

Keywords: Problem-solving, test anxiety, academic performance.

INTRODUCTION

Anxiety is a normal reaction to any perceived threat or concern. If we believe something important to any individual is in danger of being threatened. One may over-estimate the threat and underestimate our ability to cope with it. Also the environment is physically, mentally, emotionally, socially and morally dynamic and challenging. Anxiety is concept that is complex and mysterious, as Freud realized many years ago. Anxiety, as an emotional component of human beings, manifests itself in life endeavors in form of worries and restlessness. People are beset by intense feelings every day because life continuously poses problems which every person strives to find solution to. According to Barlow (2002), anxiety is a negative mood state characterized by bodily symptoms of physical tension and apprehension about the future. It is a psychological problem characterized by somatic emotional, cognitive and behavioural components. Anxiety is a general term for several disorders that cause nervousness, inability to sleep, apprehension and worrying. These disorders affect how one feel and believe, and can manifest in real physical symptoms. Mild anxiety is vague and unsetting, while severe anxiety can be extremely debilitating having a serious impact on a daily life.

Corey (2001) viewed anxiety as a learned response to situations that threaten an individual's security and self-esteem. According to Mischel (2014), anxiety is believed to be a pattern of behavior which occurs in response to cognitive or environmental stimuli resulting into changes in the rate of heartbeat, blood pressure and somatic motor behaviors such as trembling, stuttering and so on. Students are often confronted with lots of mental task that

cause anxiety especially at examination or test periods. When this kind of emotional component manifests with regard to a test or examination condition, it is then regarded as test anxiety. Busari and Uwakwe, (2008) affirmed that victims of extreme anxiety are not , able to think of solution or adaptation to their immediate problem.

Many authors like Petronson (2011) defined test anxiety as an individual's physiological, cognitive and behavioural responses that stimulate negative feelings about an evaluation. When an individual experiences test anxiety, these physical and cognitive responses may lead to negative feelings and cognitions about testing situations. Also according to Olatoye and Afuwape (2009) test anxiety is the I physiological state of mind of a candidate about a test as expressed by the level of worry, fear, j uncertainty, concern and helplessness before, during or even after a test or examination. When an individual becomes anxious, the physiological system becomes aroused, such as the heart beating f faster or the sweat glands producing more perspiration. At the same time the person may experience a higher sense of inadequacy. Okatahi (2006) ascertained that students are often confronted with lots of mental tasks that cause anxiety especially during test or examination periods. Test anxiety as an emotional reaction of students in testing situation has been identified by psychologists as one of a determinant of academic performance. Such emotional state is accompanied with feelings of \ inadequacy, helplessness, heightened somatic reaction, anticipation of punishment and loss of status.

Furthermore the causes of test anxiety according to Barlow (2002) are both internal and external stimuli. The internal stimuli compose of feelings of thoughts and events and what goes on around and external stimuli compose of environmental situations which give some concern of fear which cover general events about life. In 2007, Oresanya affirmed that anxiety may also arise when there is frustration occurring in some major life problems related to vocational, educational or adjustment. Excessive test anxiety may occur when the teachers threaten the students with a test. Spielberger and Sarason, (1989) stated other factors that contribute to the development of test anxiety, among which are; self concept, self- awareness, self-image, peer factors and so on. If an individual's experience is negative, then the test anxiety level will be higher leading to lower performance. Consequently, if an individual's experience is positive, then, the test anxiety level will be lower leading to higher performance. Above all, it is important to consider motives, aptitudes, cognitive assessment of the task and past experience when analyzing test anxiety and how it relates to performance. Although, Akinmoye and Adeyoju (2014) in their studies investigated the causes of academic failure among students. They identified faulty or defective study skills, lack of self- control, and in-appropriate method of preparation for test and examinations as factors responsible for academics failure.

Effects

Mckeachie, Lin and Holinger (2009) highlighted the inhibitive effect of test- anxiety on academic performance. Their views affirmed that high anxious students have been found to perform more poorly on cognitive demanding task than less test anxious subjects especially when performance I condition is evaluative. During difficult task in which evaluative stress is present, low test anxious students tend to achieve better than high test anxious students. They noted that high test anxious students are dexterously affected by conditions such as

achievement-orienting instruction. This is in agreement with Seinp, (2000) in the study of the relationship between anxiety and academic performance among students states test anxiety usually lead lower test performance.

Thus, over the year, some stakeholders have put in some efforts, apply measures and used many techniques to correct this problem of test anxiety among students in Imo state and several psychologists have come up with several psychotherapies such as systematic desensitization (Davis & Palladino, 2008), aversion therapy (Marlor & Gordon, 2013), among others but despite the efforts made by various stakeholder, the problem of test anxiety is far from being solved and this results to persistent poor performance among Secondary students in Nigeria and in Imo state. In an attempt to construct positive attitude among students and provide the solution to test anxiety among secondary student in Imo State, the researcher intend to empirically establish the effects of problem solving technique on test anxiety among secondary school students in Imo State. According to D'Zurilla (2005), solutions must be implemented and the consequences of one's choice evaluated. Problem-solving strategy includes self-monitoring, self-control, self-reward, self-statement, self-talk etc. the basic idea of self-management interventions is that change can be brought about by teaching coping skills in problematic situations. The technique concerned itself with teaching people the skills they will need to manage their own lives effectively.

Training in effective test-taking skills could compensate for deficit caused by test-anxiety because it is a natural self-reaction to learn and realistic view of the world around us reveals the fact that human beings are continually confronted with situational problems which he or she must solve in order to maintain an adequate level of effective functioning.

Problem-solving as defined by D, Zurilla (2003), is a cognitive activity aimed at changing a problem from a given state to the goal state. Problem solving technique is cognitive because it occurs within the problem solver and can only be inferred from the problem solver's action. According to Mayer, (2010) problem solving technique can sometimes be used interchangeably with thinking and cognition. Inductive and deductive reasoning can be seen as part of sub-categories within the broad category of problem-solving.

Problem-solving as a behavior therapy involves learning, how to size up the different characteristics of problems, gather data on the problem, and clarify their severity. Skills are there-by developed concerning formulating reasonable problem-solving goals, generating alternatives solutions and selecting from the alternatives. In problem-solving program, decisions are made concerning specific behaviour to be controlled or changed. Examples are control of smoking, drinking, drug addiction, time-management, learning, study skills and dealing with obesity and over eating. It is observed that a major reason for students not attaining their goals is the lack of certain skills or unrealistic expectations of change. It is in this vein that problem-solving technique training is to be provided as a guide line and a plan that will lead to change, thus, the need for this study. Based on the above assumptions, this study is to determine the effect of problem- solving technique in reducing level of anxiety among students, and to enhance academic performance.

Hypotheses

The following null hypotheses were tested at 0.05 levels of significances

1. There is no significant difference in the Pre-test and Post-test test anxiety mean scores of students exposed to problem solving technique and those in the control group.

2. There is no significant difference in the pre- test and post- test academic performance of students exposed to problem-solving technique and control group.

3. There is no significant difference in the Pre-test and Post-test test anxiety mean scores of male and female students exposed to problem solving technique.

Method

Research Design

The research design adopted for the study was quasi-experimental that employed pre-test, post-test experimental and control groups. The population of the study was 338 secondary school students with test anxiety disposition which consisted of J.S.II and .S.S II students of seven secondary school located in Orsu local government area managed by the Ministry of Basic and Secondary Education, in Owerri (MBSE, 2015).

The sample of the study was 69 students with high test anxiety disposition. A purposive sampling technique was used in selecting two secondary schools out of seven secondary schools because they have the highest number of students with test anxiety. Through the use of test anxiety scale instrument which was developed by the researchers. Secondary school students with test anxiety were identified in each school. Male scores that were above 40.16 and female scores that were above 36.16 were identified as secondary school students with test anxiety. A total of sixty-nine students were selected from the two schools. The researcher after the pre-test apportioned 36 participants to represent the experimental and another 33 participants to form the control group. The instrument used for the study was a self-developed questionnaire titled Test Anxiety Scale (TAS). The instrument was divided into two sections A and B. Section A consisted of items on demographic data of the respondents such as name of school; class, age, and sex. Section B contained 18 items describing different forms of feelings leading to test anxiety. The items focus on four major feelings such as; social humiliation, self-image, physiological hyper arousal and unpreparedness. The respondents will be required to indicate by ticking (√) how often they experience certain feelings, thought and actions. The instrument for date collection has both direct and reverse scoring pattern. The reverse scoring items are 1, 4, 5, 7, 9, 10, 13 15, 17 while 2, 3,6,8,11,12, 14, 16,18 are the direct scoring items. In order to determine the academic performance, a teacher made test was conducted for the pretest and post-test. The outcome of the post-test result confirmed the effectiveness of the therapy.

The instrument was validated by one expert in measurement and evaluation department and one in guidance and counseling department. The instrument was refined to meet face and content validity in line with corrections of the experts. The validity index of the instrument was 0.82. This value attests to the validity of the instrument. And the reliability of the instrument was established through the test- retest method. The instrument was administered twice with an interval of two weeks on 20 students that were not part of the sample but identified with high level of test anxiety. The two sets of scores from the responses were correlated using Pearson Product Moment Correlation method with a reliability coefficient of r=0.87. The value obtained attest to the reliability of the instrument.

The data collected for this study will be organised in table and analysed. Mean will be used in answering the research questions and analysis of covariance (ANCOVA) will be used in testing the hypotheses at 0.05 levels of significance. The scoring of the instrument will be done in accordance with the test anxiety Manual, for direct scoring, strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1, while for reverse scoring strong agree = 1, agree = 2, disagree =3 and strongly disagree = 4. The instrument for date collection has both direct and reverse scoring pattern. Finally the method of data collection was done in three main phases. Firstly, the test anxious students were identified through the test anxiety scale. The identified test anxious students were assigned to the treatments and control groups in equal representation of gender and class.

Secondly, the experimental group was exposed to one hour of six weeks sessions of therapy on problem solving technique: In all, each of the students in the experimental group had six contact sessions of therapy. The treatment commenced with an address by the researcher to the experimental group on the reason for the programme, the rules of the programme, the need to be themselves, feel free to discuss their problems and ask questions when the need arises**.** Students in the control group were given conventional counselling.

The third phase involved the evaluation of the treatment package and the entire programme. The researcher administered the post-test to determine the effect of the treatment package in reducing test anxiety. After this, the researcher thanked the subjects for their cooperation throughout the programme.

Results

Hypothesis 1

There is no significant difference in the effective of problem solving technique in reducing secondary school students' test anxiety when compared with those in the control group.

Table 1 ANCOVA on the post test anxiety mean scores of students exposed to problem solving technique and those who received conventional counselling

Source of variation	SS	df	MS	Cal.F	Crit.F	P≥0.05
Corrected Model	2934.542	2	1467.271			
Intercept	332.639	1	332.639			
Pretest Scores	0.001	1	0.001			
Treatment Models	2847.81	1	2847.081	200.14	3.98	S
Error	1009.999	66	14.225			

Total	101004.000	69
Corrected Total	3944.541	68

In table 1, it was observed that at 0.05 level of significance, ldf numerator and 68df denominator, the calculated F 200.14 is greater than the critical F 3.98. Therefore, the first null hypothesis is rejected. So, there is significant difference in the effect of problem solving technique in reducing secondary school students' test anxiety when compared with those in the control group.

Hypothesis 2 There is no significant difference in the effect of problem solving technique in improving secondary school students' academic performance when compared with those in the control group.

Table 2 Pretest and Posttest academic performance of subjects exposed to problem-solving technique and control groups

Source of variation	ss	df	MS	Cal.F	Crit.F	**P ≥0.05**
Corrected Model	207.700	4	521.925			
Intercept	332.597	1	332.597			
PRETEST	59.621	1	59.621			
Treatment Models	98.587	1	98.587	5.52	4.11	S
Error	571.057	32	17.846			
Total	338999.000	36				
Corrected Total	778.757		35			

Table 2 showed that at 0.05 level of significance, ldf numerator and 35df denominator, the calculated F 5.52 is greater than the critical F 4.11. Therefore, the second null hypothesis is rejected. So, there is significant difference in the effect of problem solving technique in improving academics performance secondary school students when compared with those in the control group.

Hypothesis 3 There is no significant difference in the Pre-test and Post-test test anxiety mean scores of male and female students exposed to problem solving technique.

Table 3: ANCOVA on the posttest test anxiety mean scores of male and female students exposed to Jigsaw learning technique.

Source of variation	SS	df	MS Cal. F	Crit. F	P ≥0.05
Corrected Model	207.700	4	521.925		
Intercept	332.	.597	1 332.597		
PRETEST	59.621	**1**	59.621		
GENDER	98.587	**1**	98.587 5.52	4.11 S	
Error	571.057	32	17.846		
Total	338999.000	36			
Corrected Total	778.757	35			

Table 3 reveals that at 0.05 level of significance, ldf numerator and 35df denominator, the calculated F 0.40 is less than the critical F 4.11. Therefore, the third null hypothesis is upheld. So, there is no significant difference in the effectiveness problem solving technique in reducing test anxiety of junior and senior secondary school students.

Discussion

The results obtained from this study indicate that problem solving technique therapy reduced the level of test anxiety of students and improved the academic performance of experimental group. The reduction in test anxiety is in consonance with finding from previous studies by Menucha (2007) and. He findings indicated that reduction of test anxiety could be attributed to the problem solving techniques treatment which enabled the students in the experimental group to be better equipped and relaxed to face evaluative situations like tests and examintions. Also, the training the students in experimental group received on how to prepare and write test and examination could have succeeded in dislodging the illogical thinking of students and replacing them with logical thinking; which therefore helped in reducing test anxiety to improve their academic grades. After the problem-solving training technique, the mean score of anxiety level of experimental group dropped below while the academic grades increased as indicated on tables one, two and three. The findings from hypotheses one shows a significant difference in test anxiety levels and academic performance of experimental and control groups. Students exposed to problem-solving treatment technique had a lower post-test scores compared to their counterparts in the control group.

This is in support with the earlier view and findings of Barlow, (2002) who related test anxiety to family setting where parents exert pressure on their children in school to excel in their academic performance. Such high expectation often results into high test anxiety.

Table 2 shows a significant difference in the level of academic performance of experimental and control. Since the experimental group succeeded in practicing the processes in overcoming their test anxiety levels, it equally meant that they used the process to reduce their academic failure having gained some measures of self confidence in dealing with their

failure situation. The findings corroborated Hassan and Okatahi (2013) which indicated that problem solving technique could reduce anxiety and improved the academic performance of students.

Eventually, no significant difference was established in academic grades of male and female students of the experimental group. One explanation for this is that both male and female students went through the training of problem solving technique and the result on hypothesis 3 shows that the training session had an effect on subsequent examination grades of the students irrespective of gender However, the finding of this study did not support the submissions of Effandi (2013), he found significant difference between the scores of male and female students on the instruments developed for measuring test anxiety. Furthermore, the study of Adebule (2004) on gender difference on a locally standardized anxiety rating scale in measuring test anxiety also disagreed with the result of this study as it concluded that there is significant difference between the scores of male and female students on test anxiety scale in relation to statistical significance.

Conclusion

It is evident from the findings of this study that experimental students exposed to problem-solving technique were able to demonstrate a healthy behavior pattern while the control group opened to placebo were unable to show any sign of improvement in their behaviour disorder of anxiety, it is important to note that anxiety is very hard to study. In humans it can be a subjective sense of unease, a set of behaviours, fidgeting, or a physiological response originating in the brain and reflected in elevated heart rate and muscle tension. A close look at the hypotheses results showed that problem solving technique training effect was significant for all the variables except one. It is therefore believed that the psychological intervention taught students skills that could be used to manage their anxious worried and anxious, fidgeting, or a physiological response originating in the brain and reflected in elevated heart rate and muscle tension

Recommendations

Based on the findings, the following recommendations are hereby made:

1. As the use of problem solving technique has been shown to be effective on test anxiety among secondary school students. Practising school counsellors should leam to use the technique to assist students with test anxiety.
2. The use of problem solving technique should be commenced in full force in secondary schools in Imo state irrespective of students' gender and age as a way of enhancing student better understanding in test anxiety. The government should endeavour to enforce.
3. The Imo State Post Primary schools Service Commission should provide on -the-job training to practising school counsellors and teachers on the use of problem solving technique in treating test anxiety through seminar, symposia and conference.

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