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Provocation and Emotional Mastery Techniques as Strategies for Fostering Creative Thinking Competence among Nigerian Adolescents

A. O. Ogunyemi

Department of Educational Foundations and Counselling, Olabisi Onabanjo University, Ago - Iwoye, Nigeria
Telephone: 08055301472, E-mail: jibolaogunyemi@yahoo.com

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ABSTRACT With rapid changes in technology and global competition, the success of many organisations has become progressively more dependent on their ability to bring innovative products to market. Ultimately, however, innovation depends on the generation of novel ideas, which in turn depends on good strategies/techniques. It is in the light of this that this study investigated the effects of provocation and emotional mastery programmes at fostering creative thinking competence of Nigerian Adolescents. The study also aimed at establishing whether gender will moderate the effects of the two techniques on creativity skills of adolescents. A pretest-post-test 3 x 2 factorial design was adopted. The simple random sampling procedure was used in selecting participants and assigning them to two treatments groups and the control group. A total of 270 participants taken among senior secondary school students in three randomly selected public secondary schools participated in the study. Data were collected using ideative originality scale (IOS). Analysis of covariance (ANCOVA) was employed for data analysis with significant level fixed at 0.05. Findings from the study revealed that the treatments differentially and significantly affect participants' levels of creativity; Gender, as well as gender and treatment were found not to have any significant effects on participants' levels of creativity. On the basis of the findings, the study advocated for the teaching of creativity as school subject in secondary schools.

INTRODUCTION

With rapid changes in technology and global competition in all facets of human endeavour, it is crucial than ever that adolescents who are the hopes of tomorrow are fully equipped with lifelong skills that will make them relevant, and be able to subdue hindrances that may prevent them from translating their dreams to realities. When they are not well prepared for the challenges ahead most especially from the secondary school stage of education, the cost to individuals and the implication to the nation can better be imagined. The world of work has become dynamic to the extent that individuals require lifelong skills to survive. In this ever-changing world, adolescent that relies on old methods for solving today's problems may have his dream for a better tomorrow shattered. The complexity of life challenges demands that we are forward looking in our approach to issues; as the solutions to yesterday's problems may be inadequate and misleading in tackling today's problems.

Given the importance of education to individual and nation's development, it is not surprising that a sizeable literature has evolved on factors that can promote academic excellence and by extension personal development of individuals. Early efforts focused on cognitive factors; but since these variables typically account for relatively small amounts of the variability in academic success (Ransdell 2001). Researchers the world over, have become increasingly aware of the need to study a broader range of potential predictors of academic success.

In today's information age, creative thinking skills are viewed as crucial for students to cope with a rapidly changing world. Many scholars now believed that specific knowledge would not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information (Gonen 1993). If adolescents are to function effectively in this age of massive discontinuities and accelerating change, they must be equipped with lifelong learning and creative thinking skills necessary to acquire and process information.

Unfortunately, while the importance of cognitive development has become widespread, critical thinking is not. Most students do not score well on tests that measure ability to recognise assumptions, evaluate arguments and appraise inference

(Norton 1971). Students' performance on measures of higher order thinking ability has displayed a critical need for students to develop the skills and attitudes of effective thinking (Robinson 1980).

Recent research findings (Amabile et al. 2003; Parker et al. 2004b) have indicated that cognitive intelligence, academic degree and other documentation of accomplishments do not ensure success in life. Rather, creative thinking competence skills are among the core keys identified as sources of viable ideas which form the building blocks for human success. Creativity skills are the engines that can drive sustainable human development. According to Akinboye (2003) "all the indexes of sustainable human development are not realisable if individuals, groups, corporate organisations … lack creative thinking, can not use new ideas, new concepts and precepts to innovatively create …" (p. 289). Any viable endeavour starts with creativity to generate ideas, which are transformed into success through appropriate action step.

Creativity is the process of producing original and imaginative thoughts, ideas or concepts and putting them together in new and useful ways. Creativity propels organisation, catapult careers, and generate potent growth and viable outcome. The more creative a person is, the more self-reliant he becomes to enrich the quality of his own life, family, group and society at large. Teaching critical thinking skills therefore becomes the single most important thing that any country can do to enhance the development of her citizens. Consequently, the present study attempts to foster creative thinking ability of adolescents in secondary schools using provocation and emotional mastery training programmes.

Provocation is a creativity technique developed by Edward de Bono. It is a technique that requires lateral thinking. It involves moving our thinking out of the established patterns that we use to solve problem normally. Provocation creativity technique is a challenge to exclusivity, which does not accept status quo and is particularly relevant in those areas where ideas have become obsolete with time. Provocation is more in the nature of hypothesis where a situation is first conceived or imagined and then one proceeds to arrive at unique plausible conclusions.

Although, a lot of research findings have confirmed that creativity skills are learnable skills and that some of the creativity techniques (Brainstorming, Brain-writing, Six Thinking Hats etc) can foster creative competence skills of both adolescents (Akinboye 1976; Animasahun and Akinboye 2002) and adults (Owodunni 2002; Amabile et al. 2003). However, there is dearth of research effort on the efficacy of provocation technique at fostering creativity skill of either adolescents or adults; hence the essence of the present study.

Furthermore, there is growing recognition of the key role that emotions play in our lives. We are generally realising the limit of our minds and the need to balance intellect with feeling and emotion. The rapid change and the growing complexity of life challenges have made understanding and mastery of the emotions increasingly important. According to Castella (2001) "What really matters for success, character, happiness and life long achievement is a definable set of emotional skills…" (p. 29). Emotional mastery is the ability to process our emotions so that their message gets to us and their energy is used for appropriate actions (Steve 2001). It requires gaining an understanding of how our emotions affect us and how we can use them to improve the quality of our lives. Emotions are generated from the brain and the brain drives the body. This is probably why anytime people need creativity they tend to be in an emotional state. Creativity is tied to strong emotions, which both give it power and make it challenging (Akinboye 2003). Study (Delroy and Gordon 1996) has confirmed that it is within the area of emotional life that a sort of creativity is released.

From the preponderant research evidence on creativity and emotional related variables (Echeveria 1997; Akinboye 2003) there appear to be a symbiotic relationship between creativity and emotions. But there is little research effort on the effect of emotional mastery programme at enhancing creative thinking competence skills. Also, the efficacy of provocation and emotional mastery programmes put together, in fostering creativity has not been subject of formal investigation; hence the essence of the present study.

The present study also considers gender as second level independent variable to determine its influence on creativity skills of adolescents. The reason for this is based primarily on the sociocultural differences among girls and boys (Abra 1991). Traditionally, girls in our society have been encouraged to conform, whereas boys are expected to be active and dominant risk-takers

(Block 1976). Furthermore, findings of several studies on gender differences in creativity have been inconsistent (see Warrren and Luria 1972; Kongan 1974; Torrance 1983; Tegano and Moran 1989; Kristen et al. 2001)

The question raised and answered in the present study is: will there be any significant effect of provocation and emotional mastery programmes in fostering creativity skills of adolescents?

METHOD

Design and Participants

A 3X2 factorial design was employed. The various factors are treatments, which exist at three levels (i.e. provocation, emotional mastery and the control group) and gender, which was observed at two levels (i.e. male and female). A total of 270 senior secondary school students randomly selected from 3 public secondary schools in Ijebu North Local Government Area of Ogun State, Nigeria participated in the study. Thirty of them each were randomly assigned to the two experimental treatment groups and the control group with regards for gender in each of the sample schools. On the whole, a total of 121 males and 149 females were used for the study. The age range of the participants was between 12 and 18 years with the mean age and standard deviation of 16.89 and 1.43 years respectively.

Instrumentation

The Ideative Originality Scale by Akinboye (1976) was used in this study to obtain pre-post treatment mean scores of the subjects on creativity. The scale is a part of test battery – Ibadan Creativity Assessment Scale (I.C.A.S). It is a unidimensional behavioural creativity scale. The scale has two sections. Section A was meant to elicit biographical information such as sex, age etc and section B has twenty-five items on creativity. Participants are to indicate their degree of agreement with each item on a five point likert type scale ranging from 0 (Totally unlike me) to 4 (very much like me). The highest total score obtainable on the scale is 100 (i.e. 4 X 25), while the lowest is 0 (i.e. 0 X 25). A high score indicates high creativity ability, while a score of seventy indicates a minimum acceptable creativity potential in an individual. Akinboye (1976) reported an internal consistent co-efficient alpha of 0.71 for ideative originality scale and a test - retest reliability of 0.77 after three weeks of administration. A convergent construct validity with personal motivation creativity inventory also by Akinboye (1976a) revealed r = 0.73. Some of the items of the scale are "I'm attracted to difficult jobs", "I can pick out valuable things out of many seemingly attractive one", "I like solitary life", "I like to do things the way I think right", "innovations and introduction of the unusual makes one happy and healthy", "I follow instructions very closely" etc.

Procedure

The programme commenced with an initial introduction, rapport building, orientation as well as motivation to participate in the training programme. Then, the subjects balloted for distribution into the 2 experimental groups and the control group with regard for gender. Creativity test was thereafter administered on them to collect pre-test scores. This was followed by 8 weeks of 8 sessions of intensive training in creativity at each level of the experimental groups (i.e. provocation and emotional mastery treatment groups). The participants in the experimental group one were exposed to provocation programme and those in experimental group two were exposed to emotional mastery programme. The control group was however not exposed to any treatment; but was taught the Nigerian political history from the military era to date just to keep them on.

The training programme was executed through series of lectures, focus group discussion, case study analysis and take home assignment. At the end of the 8 weeks of intensive training sessions, creativity test was again administered on the participants to collect post-test scores. The outlines of the intervention packages at each level of the experimental groups are as follows:

Provocation Experimental Group

(i) the meaning, nature and importance of creativity
(ii) the meaning, nature and importance of provocation creativity technique
(iii) methods of provocation creativity technique (e.g. escape, reversal, exaggeration, wishful thinking and distortion)
(iv) simulation exercise using each of the provoca-

tion techniques/methods in generating new ideas
(v) post test administration and formal closing of the programme

Emotional Mastery Experimental Group

(i) meaning, nature and importance of emotional mastery
(ii) types of emotion (i.e. fear, anger, sadness and joy) and their contributions to healthy and successful life.
(iii) methods/strategies for regulating emotions (e.g. external regulatory and internal regulatory strategies)
(iv) ways of dealing with negative emotions
(v) using emotions to facilitate thinking
(vi) skills of emotional literacy (e.g. capacity for self-awareness; ability to perceive, identify and express emotion; emotional understanding; emotional management)
(vii) steps to mastering emotions
(viii) simulation exercises using the four major types of emotions to facilitate thinking
(ix) post-test treatment administration and formal closing of the programme

Method of Data Analysis

The Analysis of Covariance (ANCOVA) was employed to analyse the data collected through pre-post test treatment administration.

RESULTS

Hypothesis One: There is no significant effect of provocation and emotional mastery programmes on participants' level of creativity.

The results in Table 1 revealed that there is a significant effect of provocation and emotional mastery programmes on participants' level of creativity ($F_{(2,263)} = 24.843$; $p < .05$). No significant effect of gender on participants' level of creativity was indicated ($F_{(1,263)} = 2.073$; $p > .05$). Also, no interaction effect of treatment and gender was shown ($F_{(2,263)} = .146$; $p > .05$).

The results in table 2 revealed that significant effect of treatment exists in the level of creativity of participants. The calculated F Ratio of 24.843 was found to be higher than the critical F ratio of 3.00 at 2 and 263 degrees of freedom. This finding rejected the null hypothesis of no significant effect of provocation and emotional mastery on participants' level of creativity. To determine the directions of difference, a pairwise comparison was done on the treatment techniques. Results are presented in table 3.

Results in table 3 showed that significant difference existed in the level of creativity between participants exposed to provocation and those exposed to emotional mastery programme (MD = 4.797; $p < .05$), between participants exposed to provocation and those exposed to control (MD = 9.83; $p < .05$) and also between participants exposed to emotional mastery and those exposed to control (MD = 5.034; $p < .05$).

Table 1: Analysis of covariance of the main and interaction effects of provocation and emotional mastery and gender on participants' level of creativity

Source	*Type III sum of squares*	*Df*	*Mean square*	*F*	*Sig.*
Corrected Model	7015.801(a)	6	1169.300	13.426	.000
Intercept	11097.381	1	11097.381	127.420	.000
Precreativity	2084.282	1	2084.282	23.932	.000
Group	4327.370	2	2163.685	24.843	.000
Gender	180.576	1	180.576	2.073	.151
Group * gender	25.255	2	12.628	.145	.865
Error	22905.417	263	87.093		
Total	835599.000	270			
Corrected Total	29921.219	269			

a R Squared = .234 (Adjusted R Squared = .217)

Table 2: Univariate analysis of covariance of the effects of provocation and emotional mastery on participants' level of creativity

	Sum of squares	*Df*	*Mean square*	*F*	*Sig.*
Contrast	4327.370	2	2163.685	24.843	.000
Error	22905.417	263	87.093		

The F tests the effect of group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Hypothesis Two: There is no significant effect of gender on participants' level of creativity.

The results in table 4 revealed that there is no significant effect of gender on participants' level of creativity. The calculated F-Ratio of 2.073 was found to be lower than critical F-Ratio of 3.84 at 1 and 263 degrees of freedom. The null hypothesis of no significant effect of gender on subjects' level of creativity was therefore accepted by this finding. This implies that level of creativity of subjects is not gender related.

Hypothesis Three: There is no significant interaction effect of treatment and gender on participants' level of creativity.

The results in table 1 revealed that there is no significant effect of gender on participants' level of creativity. The calculated F-Ratio of .145 was found to be lower than critical F-Ratio of 3.00 at 2 and 263 degrees of freedom. The results in table 5 indicated that there is no significant interaction effect of treatment and gender in the level of creativity of participants.

Male participants under the provocation group had a mean score of 60.771 and a standard error of 1.445 compared to those under the emotional mastery group with mean and standard error of 55.218 and 1.535 respectively and those under the control group with mean and standard error of 50.598 and 1.442 respectively. Also female participants under the provocation group had a mean score of 58.377 and a standard error of 1.347 compared to those under the emotional mastery group with mean and standard error of 54.335 and 1.287 respectively and those under the control group with mean and standard error of 48.887 and 1.349 respectively. The null hypothesis, which

Table 3: Pairwise comparison of the differences in the level of creativity of participants in provocation, emotional mastery and control group

(I) Group	*(J) Group*	*Mean difference (I-J)*	*Std. error*	*Sig.(a)*	*95% Confidence interval for difference(a)*	
					Lower Bound	*Upper Bound*
Provocation	Emotional mastery	4.797(*)	1.406	.001	2.029	7.566
	Control	9.831(*)	1.395	.000	7.085	12.578
Emotional mastery	Provocation	-4.797(*)	1.406	.001	-7.566	-2.029
	Control	5.034(*)	1.404	.000	2.269	7.800
Control	Provocation	-9.831(*)	1.395	.000	-12.578	-7.085
	Emotional mastery	-5.034(*)	1.404	.000	-7.800	-2.269

Based on estimated marginal means

* The mean difference is significant at the .05 level.

a Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Table 4: Univariate analysis of covariance of the differences in male and female participants' level of creativity.

	Sum of squares	***Df***	***Mean square***	***F***	***Sig.***
Contrast	180.576	1	180.576	2.073	.151
Error	22905.417	263	87.093		

The F tests the effect of gender. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Table 5: Descriptive statistics of creativity scores of male and female participants in provocation, emotional mastery and control groups

Group	*Gender*	*Mean*	*Std. error*	*95% Confidence interval*	
				Lower bound	*Upper bound*
Provocation	male	60.771(a)	1.445	57.925	63.617
	female	58.377(a)	1.347	55.724	61.030
Emotional mastery	male	55.218(a)	1.535	52.195	58.242
	female	54.335(a)	1.287	51.801	56.869
Control	male	50.598(a)	1.442	47.758	53.437
	female	48.887(a)	1.349	46.232	51.543

a Covariates appearing in the model are evaluated at the following values: pre-test creativity = 52.0333.

stated that three is no significant interaction effect of treatment and gender on participants' level of creativity, was sustained by this finding. The finding implies that treatment would not interfere with gender in fostering creativity skills of participants.

DISCUSSION

Results of this study indicated that provocation creativity technique and emotional mastery programme had significant impact on participants' level of creativity. This was reflected in the increase in the post-test creativity scores of participants under the two experimental groups (i.e. provocation and emotional mastery) on the one hand, and the significant difference in the post test creativity scores of participants under the two treatment groups and their counterpart in the control group on the other hand (see tables 3 and 5). The research outcome here is a clear indication that the effectiveness of the two programmes (i.e. provocation and emotional mastery programmes) at fostering participants' creativity skills could not have occurred by chance; rather due to the teaching of specific skills in the two techniques. The results established the mutual importance of the independent variables in exerting influence on the criterion variable. The finding further confirmed that creative performance requires a set of skill specific to creativity (i.e. creativity relevant skills). Further, the results was consistent with the findings of Akinboye (1978, 1979, 2000), Adedipe (1987), Amabile (1988), Feldhusen and Goh (1995) who established that creativity could be fostered through training; and that individuals ability and capacity can be enhanced through subject matter instruction.

The fact that there was differential improvement in the post-test creativity scores of participants in the two experimental groups in favour of participants under provocation programme is not surprising. This finding is in the expected direction. Provocation technique is a creativity tool specifically designed to foster individual's creative thinking ability. However, emotional mastery programme is a strategy for enhancing emotional literacy skills of individuals. It is therefore expected that the post-test creativity scores of participants under the provocation programme would be higher than those in the emotional mastery experimental group. The gem of the findings of the present study however, is that emotional mastery programme is also a good technique for fostering creativity skills of adolescents. With exception of very few studies not known by the researcher, emotional mastery technique has never been directly empirically tested against creativity. Thus, the findings add to the literature on emotions and creativity theories.

The results that no significant gender effect, and 2-way interaction effect of gender and treatment on participants' level of creativity corroborates the assertion of de Bono (1992b) and Akinboye (1978a) that creativity is not a mysterious talent peculiar to some people. The findings affirm their claims that creative thinking ability is not gender specific. The findings also support the works of Selby et al. (1993), Gonen (1993), Hoover (1994) and Khaleefa et al. (1996) who found no significant difference in the creativity score of male and female participants in their various studies.

CONCLUSION AND RECOMMENDATION

The outcome of the present study calls attention of all and sundry, especially government and policy makers to the need to give creativity its rightful place in the school curricular for purposeful education and personal development of individuals. In most Nigerian schools today, little attention is paid to the nurturing of student's creativity competence potential, with emphasis too often placed on rote and repetitive learning. Our schools and cultures emphasise and reward academic intellect. But in view of recent research findings (Akinboye 2000), which revealed that academic intelligence alone does not guarantee prosperity; there is need for a total re-engineering of the educational system with a sole objective of making it functional. The present situation where a reasonable percentage of able-bodied youths roam about the street endlessly in search of non-existing job is not good for the image and development of any country. There is need to integrate in the secondary school curricular the type of training skills competence that can explore the factor and skills that contribute to the development of an individual's potentials for creative thinking.

Government concerns and determination presently, for a total re-engineering of the educational system is a step in the right direction.

However, for this objective to be properly achieved; and for Nigerian students to stand shoulder-high among their colleagues in the advanced countries, creativity competence skills should be among school subjects to be formerly taught and examined as part of the cornerstones of primary and secondary education curricular, if not at all tiers of education.

The reason for advocating the teaching of this important construct is to improve the thinking skills of students at the early stage of their academic career so as to equip them with necessary skills for coping in a fast growing world like ours. Although, one may have the illusion that teachers automatically teach critical thinking when they teach their subjects, especially mathematics and science, the two disciplines, which supposedly epitomise logical thinking. But the truth is that teachers seldom teach students how to think. Instead, they teach them what to think. From experience, we do an excellent job of transmitting the content of our respective academic disciplines, but we often fail to teach students how to think effectively about this subject matter, that is how to properly understand and evaluate it. And as such, many students never develop creative thinking skills.

Government should also re-examine its policy concerning over dependence on certification. This has made teachers and students focus all their energies and efforts on the task of transmitting and acquiring basic knowledge. This goal is so overwhelming that they both tend to forget that the objective of education is not only about "what to think" but also about "how to think".

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