

Effect of Creativity Initiative on Biology Students' Academic Performance in Colleges of Education, South-South Zone, Nigeria

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ABSTRACT

This study examined the effect of Creativity Initiative on Biology students' Academic Performance in Colleges of Education, South-South zone, Nigeria. Two specific objectives, research question and null hypotheses guided the study. Survey research design was adopted for the study. Stratified random sampling technique was used to select 200 Biology students from the population of the study. Two instruments was developed for data collection known as Creativity Initiative Questionnaire (CIQ) and Biology Practical Achievement Test (BPAT). Two experts in Measurement and Evaluation validated the Questionnaire while the achievement test was validated by one experts in Biology Education. 25 Biology students outside the study area was used for trial testing and their responses was subjected to testing using Cronbach alpha reliability coefficient and Kuder Richard (20) [KR20] for the questionnaire and achievement test respectively. The reliability index for the instrument was .82 and .77 for questionnaire and achievement test respectively. Data was tested using simple linear regression analysis for all the null hypotheses while the Research questions was analysed using Coefficient of determination (R and R²). The finding revealed that (1) there is significant relationship between cognitive initiatives and student academic achievement and emotional initiative is significant predictor of student academic performance in Biology. Based on the finding it was recommended that (1) teachers should emphasized on learner-cantered instructional strategy, inquiry-based learning and collaborating problem-solving to improve students' cognitive initiatives and academic achievement. (2) Integrating emotional competence training into teacher education and school curriculum programme. It was concluded that that students should be encourage to use both cognitive and emotional initiative, since it improve academic achievement.

KEYWORDS

Creativity Initiative, Biology Academic Achievement, Cognitive Initiative and Emotional Initiative

I. INTRODUCTION

Creativity is the ability to make or otherwise bring into existence something new, whether a new solution to a problem, a new method or device or new artistic object or form. According to Arne (2004) identified four different types of creativity, such as deliberate and cognitive, deliberate and emotional, spontaneous and cognitive, and spontaneous and emotional Creativity involves using an existing set of knowledge or skills in a particular subject or context to experiment with new possibilities in. it is the art of turning new and

imaginative ideas into reality, characterized by the ability to perceive the world in new ways to find hidden patterns make connections between seemingly unrelated events and generate solutions. It is thinking outside of society's norm. It is the ability to come up with new and unique ideas. Cesar (2022) creativity is the ability to create items that inspire and inform others, often in aesthetically pleasing ways. Creativity education is when student are able to use imagination and critical thinking to create new meaningful forms of ideas where they can take risks to be independent and inflexible.

It allow students to approach problems in new and innovation ways.it motivate kids, light up the brain and spurs emotional development. Teacher who assign higher order cognitive skills, problem solving, critical thinking, connections between subjects which always result into better outcomes. it motivate to learn, because when students are focused on a creative goal, they become more absorbed in their learning and more driven to acquire the skills they need to accomplish it.

Creativity allows students to view and solve problems more openly and with innovation, it opens the mind. Innovating and being creative allow us to better understand concepts/construct. However, by utilizing a creative, experimental method of teaching, schools develop thinkers who are able to use their own strength to explore their varied interest. The best classroom management is one that has some elements of creativity that make lessons more engaging and interactive. With communication skills and social skill student can become good communicator. The teacher's challenge is to encouraging, exploration and experimentation and their imagination, ask your child open-ended questions to stretch their understanding and help them to postulate ideas. Teachers can teach their students in classroom about creativity like the use of graph such as mind maps Venn diagrams, visual timeliness and also to map out ideas in their own original ways. Creativity motivates kids to learn. Even though creativity can be developed outside the classroom, teachers play an indispensable role in maintain and encouraging creativity development mostly in the school system.

Biology is one of the branches of science that deals with the study of living things. The main objectives of Biology education are to prepare students to acquire adequate laboratory and field skills, meaningful and knowledge in Biology, ability to apply scientific knowledge to everyday life for personal and commonly health, agriculture and functional scientific attitude (FRN, 2014). With all the objectives of Biology education as stated above, it mean that creativity thinking is the best way of teaching and learning Biology in the school system. Some of the barriers to creativity in Biology include: lack of anatomy, unclear direction, fear, inadequate resources and functional fixedness. According to Zimmerma, B. J (2022) in his study the relationship between cognitive initiative and student's academic achievement among senior secondary school Findings revealed a significant positive relationship between cognitive initiative and academic achievement ($r = .63$, $p < .05$). Students who demonstrated higher levels of cognitive initiative consistently achieved better academic outcomes than their peers with lower levels of cognitive initiative. Pintrich, P. R. (2004). His research investigated the influence of cognitive initiative on students' academic achievement in Biology among public secondary schools. The findings showed that students with higher cognitive initiative demonstrated significantly better academic performance than those with lower cognitive initiative ($\beta = .58$, $p < .05$). The study emphasized that learners who actively seek information, evaluate evidence, and generate solutions perform better academically

because they become active participants in the learning process.

Schraw, G., Crippen, K. J., & Hartley, K. (2006). Their study explored the predictive role of cognitive initiative on students' academic achievement in secondary schools. The finding indicated that cognitive initiative significantly predicted academic achievement after controlling for gender and socio-economic status ($R^2 = .42$, $p < .05$). Students who displayed initiative in exploring new ideas, planning learning activities, and evaluating their understanding performed significantly better in school examinations. Paris, S. G., & Paris, A. H. (2001). Their research investigated the contribution of cognitive initiative to students' academic achievement in science subjects among senior secondary schools. The findings suggested that students who actively monitor their understanding, formulate learning goals, and engage in reflective thinking achieve superior academic performance. Mayer, J. D., Salovey, P., & Caruso, D. R. (2016). This study investigated the relationship between emotional initiative and students' academic performance among senior secondary school students. The findings revealed a significant positive relationship between emotional initiative and students' academic performance ($r = .58$, $p < .05$). Students who demonstrated greater emotional awareness, emotional regulation, empathy, and resilience achieved significantly higher academic scores than those with lower emotional initiative. Salovey, P., & Mayer, J. D. (2019). The study examined the influence of emotional initiative on students' academic performance in public secondary schools. Results indicated that emotional initiative significantly predicted students' academic performance ($\beta = .49$, $p < .05$). Students who effectively managed stress, maintained positive emotional attitudes, and responded constructively to academic challenges demonstrated better classroom participation and higher academic achievement.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schlesinger, K. B. (2011). Their study investigated the effectiveness of an emotional initiative training programme on students' academic performance in science subjects. The finding revealed that students exposed to the intervention achieved significantly higher post-test scores than those in the control group ($F = 18.62$, $p < .05$). Pekrun, R. (2006). The study determine whether emotional initiative predicts students' academic performance after controlling for gender and socioeconomic status. The finding revealed that emotional initiative remained a significant predictor of academic performance ($\beta = .45$, $p < .05$) even after demographic variables were controlled. Students who demonstrated confidence in managing emotions, resolving interpersonal conflicts, and maintaining emotional stability consistently achieved higher academic outcomes.

II. STATEMENT OF PROBLEM

In spite of the laudable objectives of creative thinking in the school system which among others is the a lot of turning and imaginations to perceived the world in new ways to find hidden patterns, make connections between seemingly unrelated events and generate solutions. They still less to be done in the educational system in Nigeria based on creativity initiatives because of inclusive of creativity thinking in the education curriculum and also effective implementation. For effective implementation and inclusion of the creativity initiatives in the educational system will depend on the following: learning conducted by the learning model teaching materials used, academic ability and non-cognitive factors such as

student attitude towards learning test questions and Confidence in the ability breakdown of problem to their understanding, generate ideas to solve problem of the study may be whether cognitive and emotional initiative effect student's academic performance. Against this background, the study is poised to investigate creativity initiative on Biology student's academic performance in Colleges of Education, South-South zone, Nigeria

A. *Objectives of the study*

The main purpose of the study was to investigate Creativity Initiative on Biology students' Academic Performance in Colleges of Education, South-South zone, Nigeria.

The specific objectives of the study are to determine whether.

- Cognitive initiative relate to students' academic performance in Biology
- Emotional initiative relate to student academic performance in Biology.

B. *Research question*

The following research question were posed to guide the study.

- To what extent does cognitive initiatives relate to student academic achievement?
- In what way does emotional initiative relate to students' academic performance?

C. *Research hypotheses*

The following null hypotheses were formulate to guide the study

- There is no significant relationship between cognitive initiatives and students' academic performance in Biology
- Emotional initiatives does not significantly relate to students' academic performance in Biology.

D. *Justification/significance of the study*

Creativity improve thinking capacity, students can be stimulated to think imaginatively through creative and make learning fun and easily for children.

Emotional development by children and can express themselves through creativity. It can reduce stress and anxiety. They feel joy which help them stay relaxed and prevent them from becoming anxious. Student start learning fun when creativity innovation are incorporated into the classroom, it give student a chance to learn while having fun. Creativity and innovation learning allow students to express themselves freely to boost problem solving. Creativity allow individual to think outside the box, solve problem and come up with promote self-expression, boost mental health and enhance personal and professional development, making at a valuable asset in various area of life.

Creativity can make you more productive creative people have open, active minds, they usually buzzing with ideas and soaking up inspiration.

They are three reasons of creativity in education:

It motivates kids, light up the brain and spurs emotional development. Creativity stimulates learning and enhances literacy.

III. RESEARCH METHODOLOGY

A. Design of the study

Survey research design was adopted for the study. According to Nworge (1991), survey research design is one in which a group of people or items is studied by collecting and analysing data from only a few people or items considered to be representative of the entire group. Data collected on a sample drawn from a given population is usually generalized to be the entire population.

B. Area of the study

The study area is the entire colleges of education, South South Zone, Nigeria. South South Zone is one of the six geo-political zones in the country. Tubers (2015) described south south as strategically located at the point where Y tail of the River Niger runs into the Gulf of Guinea. It occupies the southern belt of Nigeria. It was officially created and popularly called the minorities of south of southern Nigeria in 1997. It comprises six states namely: Cross River, Akwa Ibom, Bayelsa, Delta, Edo, and River State. It is bounded in the north by the south East Zone, in East by the republic of Cameroun, in the south by the Atlantic ocean and west by the south-West zone. It is described as a tropical region known for heavy rainfall. It has three coastline of Nigeria with lakes, waterfalls, lagoons, bars and delta of the coast. Numerous rivers drain the zone, among them are Cross River. Imo, Qua Ibe Benin, Forcad, Nun, Brass, New Calabar and Bonny. The historic ports of West Africa are located in this zone, viz Brass, Bonny, Warri, Forcad while Calabar and Port Harcourt handle the major export and import trade between Nigeria and countries. Transportation within the zone is by land, water and the major sea and airport in Nigeria within the zone, for instance Calabar Sea and airport. Port Harcourt airport. The south-south zone is located between latitude 4' and 6' North of the equator and longitude 6' and 8' East the prime meridian with a landmass area of 84,547 sq.km.

This zone is purely Christian dominated area and the common medium of communication is English language and the major health problems are malaria and water born disease. The zone is purely made up of civil service working population as the economy could hardly be said to be dominated by industrial workforce. South-south is the country's highest generator of foreign exchange due to its richness in petroleum and natural gas resources and therefore provides the economy's mainstay of Nigeria. The zone is also rich on other resources ranging from non-oil to agro-based and non-agro based with huge investment opportunities in tourism, manufacturing and agriculture. Many oil related industries, refineries, petrochemicals, fertilizer and oil servicing companies in the region. It is also known for

agricultural production like rubber, oil palm, and cocoa due to its hot-wet environment. The major subsistence crops are cassava, cocoyam, plantain, banana, rice and maize.

The zone has several academic institution of learning both federal and state Universities, Polytechnic and Colleges of Education.

D. Population of the study

The population of the study consist of the entire NCE 11 student in colleges of education south south zone, Nigeria offering Biology. There are 1,550 student offering Biology in the zone.

E. Sampling technique

Stratified random sampling technique was use to select 200 Biology student in six colleges of education using hat and drawn method.

F. Instruction for data collection

Two instructions was developed for data collection by the researchers. The first instrument was creativity initiative questionnaire [CIQ] based on the specific objective of the study using for point rating scales, highly utilize [HU] moderately utilized [MU] lowly utilized [LU] and Not utilized [NU] of 4, 3, 2, and 1 respectively for all the positively worded statement and revised is the case for the negatively worded statements.

The second instrument was Biology practical Achievement test [BPAT] containing 50-items of four [4] option of [A-D]. The correction option which is the key have 2-point while the distractors have zero [0] score.

G. Validation of the Instrument

The creativity initiative questionnaire [CIQ] was forwarded to two experts in school of General education, measurement and evaluation unit. While the Biology practical achievement test [BPAT] was forwarded to two experts in Biology education all in Cross River State College of Education for vetting and scrutiny. The researcher include the table of specification containing 50-point items in five topic for the Biology practical achievement test [BPAT] this establish face and content validation of the achievement tests.

H. Reliability

Twenty student outside the study was used for trial-testing to ascertain the internal consistence of the instrument, the responses obtain from the respondents will be subjected to statistical testing using Cronbach alpha reliability co-efficient and kuder Richardson [20] [KR20] for the Questionnaire and the Achievement Test respectively. The reliability index of the instruments was .82 and .77 for the questionnaire and academic test respectively.

I. Method of data analysis

The research questions was tested using Coefficient of determination R and R while the null hypotheses were analysed using simple linear regression analysis.

Hypothesis 1 [Ho: 1]

There is no significant relationship between cognitive initiatives and students' academic performance in Biology

Table 1: The hypothesis was tested using simple linear regression as shown in table

Source of variation	Sum of squares	Df	Mean square	F	Sig	R	R ²
Regression	333.988	1	333.988	4.326	.039	.146	.021
Residual	15286.232	198	77.203	-	-	-	-
Total	15620.220	199					
Variables	Unstandardized coefficient		standardized coefficient		T		Sign.
	B	Standard error	B				
Constant	55.540	3.360			15.602		.000
Cognitive initiative	.498	.239	.146		2.080		.039

As shown in table 1 the calculated F-value of the regression Anova is 4.326 and it is statistically significant at .05 significance level and (1,198) degree of freedom. This means that cognitive initiative has significant relationship with students' academic performance in Biology. This is also shown by the significant t-value ($p=.039$) of the regression coefficient for cognitive initiatives, therefore the null hypothesis is rejected. The value of the regression coefficient ($b .498$, $p=.146$) indicate that the significant relationship between cognitive initiative and students' academic achievement in Biology is positive and small. Indeed the value of the square correlation coefficient $R^2 = .021$ this implies 2.1 percent of the variance of students' academic performance in Biology can be accounted for by the cognitive initiatives. Also the positive relationship means that as cognitive initiative increases the students' academic performance is high and vice versa

Hypothesis two (Ho: 2)

Emotional initiatives does not significantly relate to students' academic performance in Biology.

Table 2: The hypothesis was tested with simple linear regression as shown in Table

Source variation	Sum of squares	Df	Mean square	F	Sig	R	R ²
Regression	8131	1	8.131	.0103	.041	.023	.021
Residual	15612.089	198	78.849	-	-	-	-

Total	15620.220	198				
P<.05	Unstandard ized coefficient		standardize d coefficient		T	Sign .
variables	B	Standard error	B			
Constant	63.955	3.56			17.965	.000
emotional initiative	.478	.244	.023		.321	.041

As shown in Table II, the calculated F-value of the regression Anova is .0103 and it is statistically significant at .054 significance level and (1,198) degree of freedom. This means that emotional initiative has significant relationship between student academic performances in Biology. This is also shown by the significant t-value ($p=.041$) of the regression coefficient for emotional initiatives, therefore the null hypothesis is rejected. The value of the regression coefficient ($b=.478$, $\beta=.023$) indicate that the significant relationship between emotional initiative and students' academic achievement in Biology is positive and small. Indeed the value of the square correlation coefficient $R^2=.024$. This implies that only 2.4 percent of the variance on students' academic performance in Biology can be accounted for by the emotional initiatives. The findings is supported by the following writers Pekrun (2006) posit that emotional initiatives predict students' academic performance. Salovey and Mayer (2019) find out that Emotional initiatives significantly predict students' academic performance.

IV. CONCLUSION

It was concluded that that students should be encourage to use both cognitive and emotional initiative, since it improve academic achievement

RECOMMENDATIONS

Based on the findings of the study the following recommendation were made:

- Teachers should emphasized on learner-cantered instructional strategy, inquiry-based learning and collaborating problem-solving to improve students' cognitive initiatives and academic achievement.
- Integrating emotional competence training into teacher education and school curriculum programme.

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