

## **Psychological Predictors of Improvisation of Instructional Materials among Secondary School Students in Rivers State**

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### **Abstract**

This study investigated psychological predictors of improvisation of instructional materials among secondary school students in Rivers State. Five research questions and corresponding null hypotheses guided the study. The design for this study is a correlational research design. The population of the study consists of all secondary school teachers in public schools in Rivers State. Currently, there are 13,764 teachers in the 271 Public secondary Schools in Rivers State. A sample of 504 teachers, which constitute 20% of the population. A multi-stage sampling technique was used for this study. Two instruments designed by the researcher were used to generate information for this study. They are: Psychological Predictor Scale (PPS) and Instructional Materials Improvisation Scale (IMIS). To ensure the reliability of the instruments Cronbach alpha ( $\alpha$ ) technique was used for both the instruments. Copies of the instruments were administered on 30 teachers who was not part of the sample for the study and then after the scores obtained was subjected to Cronbach alpha technique. The alpha coefficients of 0.75, 0.82, 0.67, 0.74 and 0.77 was obtained for the attitude, interest, self-concept, motivation instructional material respectively. The researcher administered copies of the instruments with help of research assistance to the respondents. Simple regression was used to answer questions one to four while multiple regression was used to answer the research question 5. Hypotheses one to 4 was tested using ANOVA associated with simple regression while hypothesis six was tested using ANOVA associated with multiple regression. The study found out that attitude, interest, self-concept, self-efficacy and motivation do significantly predict improvisation instructional materials among secondary school students in Rivers State. Based on the findings it was recommended among others that training of student-teachers should be reviewed to emphasize knowledge and skills related to the production and use of instructional materials.

**Keywords: Attitude, interest, self-concept, self-efficacy, motivation improvisation, instructional materials**

## **Introduction**

Innovation in education is the act of producing new things that are important and will enhance teaching and learning effectively. Improvisation is the act of making science teaching and learning materials from locally available resources. The creative potentials of the teachers are aroused with the use of instructional materials and they find teaching more interesting (Obanya, 2019). We can actually harness the best potential of the 21<sup>st</sup> century children when the necessary materials and enabling environment are provided.

Unfortunately, however, there is gross lack of instructional materials in government owned secondary schools in Rivers State and other parts of Nigeria. The absence or inadequate provision of required learning materials impede learning and cause boredom among students. The inadequacy or lack of instructional materials in schools has provoked serious concerns for research among professionals and researchers. One of the most recommended solutions to the problem is improvisation.

According to Essiet (2011), improvisation is the act of sourcing instructional materials from available sources by the teacher due to the unavailability of readymade or standardized ones. Similarly, Hornby (2010) notes that improvisation involves making things by using available resources due to the absence of the ideal material. In other words, improvisation is the local construction of instructional material against the use of industry readymade materials. Improvisation is conceptualized in this work as the use of available resources to make useful instructional materials, the ability of the teacher to use alternative means to achieve desired goal and using self-made materials in place of ready-made ones. It also implies the conversion of domestic waste materials into useful learning materials. The concept also implies the process of altering the original nature of a material for alternative uses in school learning.

Eniayeju (2019) views improvisation as the "art of substituting for the real thing". Another important view about improvisation is by Alonge (2019) who sees improvisation as not only the production of import substitution of materials or real thing, rather it is an activity in promoting curiosity, alertness, endurance and perseverance, all of which are indispensable to science, scientists and learning as a whole. Johnson (2019) defines improvisation as the process of productive thinking that can generate tangible outcome or product. Indeed, learners are stimulated, and instructions are concretized when appropriate instructional materials are used. Instructional materials are resources that teachers provide for students to use in learning simple skills such as literacy, arithmetic, observation and motor skills. These materials significantly impact on the social, emotional, intellectual, physiological and cultural development of the

students. They create deeper insight into the lesson contents, encourage critical thinking in learners, help to build self-confidence in learners, and build cooperative relationship between teacher and learners. The gains of using play materials for instruction also extend to the teachers.

The notion of improvisation redresses the old idea that every material needed for instructional activities must be classical and must be provided by the government or school administrators. This debilitating notion may have discouraged teachers to show creativity and innovation in the craft of making teaching-learning materials.

The unwillingness or inability of teachers to improvise instructional materials has posed serious concern to secondary education professionals and researchers, who have sought empirical evidence to explain the phenomenon and to proffer solution to the problem. Previous studies have linked and attributed lack of improvisation of instructional materials in schools to several factors such as low experience of teachers, low income, teachers' qualifications, teachers' gender, teachers' location, poor artistic skills of most teachers, time constraints, and unavailability of resource materials in the school and the absence of training on the production of instructional materials. For instance, Utibe-Abasi (2015) found that financial constraints, lack of skills, large class size, time constraint, school location, unavailability of tools and lack of exposure negatively influenced improvisation in schools in Akwa Ibom State; Balogun (2012) identified lack of skills in developing the resources as a problem affecting improvisation and Madubumi (2003) found lack of adequate training as a militating factor against teacher improvisation of instructional materials. However, this study seeks to investigate the psychological predictors of improvisation of instructional materials. The psychological variables are: attitude, interest, self-concept and motivation.

Attitude is a psychological construct that depicts how individuals respond to things in either favourable or unfavourable manner. Reber and Reber (2001) define attitude as some internal affective orientation that explains the action of an individual. This implies that how an individual responds to an object or situation is determined by his or her attitude towards that object or situation. Major indices of attitude include how teachers enjoy their work, how they are learner focused, their level of accountability for the children development, how they contribute to school growth, and how they collaborate among themselves.

Interest could predict teacher's dispositions to improvise instructional materials in secondary school. Interest connotes the desire to do something due to the pleasure, expectations and satisfactions derivable from doing the thing. When someone's occupation or task correlates

positively with interest, it then means he will have interest doing that task. It is natural for people to engage themselves in things they have interest in than things they do not have interest in. Engaging in things that elicit high level of interest does not only guarantee pleasure, it also assure good performance. Some basic indices for measuring interest are the high penchant to do a thing, being persistent in doing a thing, giving time to a course, being very diligent and committed despite inherent challenges in the task. Interest is being correlated with teachers' improvisation of instructional materials.

Another teachers' psychological disposition in this study is self-concept. According to Merriam-Webster 2<sup>nd</sup> edition, self-concept is the mental image someone builds of himself or herself. It is a collection of beliefs about an individual's typical behaviour, nature and peculiar qualities. Every person has the tendency of building an image of self. It is a subject analysis of oneself. Every individual is conscious of how he or she sees himself or herself to be. In trying to answer the question of which we are, we often find ourselves trying to develop a thought and feeling about who we are. Eventually, we develop a self-concept for ourselves. When the self-concept of an individual correlates positively with the ideal self he or she has fashioned in the mind, the individual gains adjustment and develops a positive perception of the world around him. However, when the contrary is the case, the individual will develop sadness and displeasure with what he does. Teachers maintain individual self-concepts in relation to their work. The self-concept of a teacher could relate either positively or negatively with the basic requirements on the job.

Motivation is another psychological variable that could predict the penchant of teachers to engage in the improvisation of instructional materials for children learning. According to Lahey (2007), motivation is the internal drive that propels an individual through his thought to engage and accomplish a task successfully. When an individual engages in a task, the likelihood that he may not accomplish it is always there. Teachers like every other worker needs motivation to do his or her task of caring for children and providing all necessary tools for work. Common indices of motivation in this study are the level of passion to do a work, amount of time committed to the work, the sacrifices made in doing one's work and the readiness to respond to assignments. In a bid to decipher possible precursors of this tendency, the researcher has designed this study to verify the psychological predictors of improvisation of instructional materials among secondary school teachers in Rivers State.

### **Statement of the Problem**

The children enjoy instructional activities that involve manipulating, fixing, drawing, painting of materials and general body movement. Learning appears more meaningful to children when play materials are used. They create deeper insight into the lesson contents, encourage critical thinking in learners, help to build self-confidence in learners, they facilitate learning and build cooperative relationship among learners and between the learners and their teacher. For the teacher, instructions are simplified and less boring with use of instructional materials.

Despite all the aforementioned benefits, there is gross shortage instructional materials in our schools thereby, causing teaching and learning to be monotonous and boring to both the teachers and students. The unavailability or inadequacy of sophisticated instructional materials would not have been a serious problem if teachers are improvising them. Being the foundational stage of education, the secondary education sets the pace for upper levels. Currently, the pace is not good enough because the children are not enjoying the glamour associated with the use instructional materials to learn. This situation exerts grave consequences on the children's future learning overall development. It also exerts negative effect on the professional growth of teachers.

Educational researchers have continued to investigate the cause of teachers' inability to make improvisation of instructional materials. Several of the existing studies have associated the problem with factors such as: inadequate training, school location, and lack of requisite skills and have made recommendations in those regards. The persistence of the problem thus calls for more research efforts to unravel other possible factors associated with the problem of lack of improvisation. The problem of this study is therefore to find out the relationship between psychological predictors of improvisation materials among secondary school students.

### **Aim and Objective of the Study**

The aim of the study is to investigate the psychological predictors of improvising instructional materials among secondary school students in Rivers State. Specifically, the study achieved the following objectives. To:

1. Find out the extent to which attitude predicts improvisation of instructional materials among secondary school students in Rivers State.
2. Determine the extent to which interest predicts improvisation of instructional materials among secondary school students in Rivers State.
3. Investigate the extent to which self-concept predicts improvisation of instructional materials among secondary school students in Rivers State.

4. Determine the extent to which motivation predicts improvisation of instructional materials among secondary school students in Rivers State.
5. Determine the joint prediction of attitude, interest, self-concept and motivation on improvisation of instructional materials among secondary school students in Rivers State.

### **Research Questions**

To guide this study in achieving its set objectives, the following research questions are raised.

1. To what extent does attitude predict improvisation instructional materials among secondary school students in Rivers State?
2. To what extent does interest predict improvisation instructional materials among secondary school students in Rivers State?
3. Does self-concept predict improvisation instructional materials among secondary school students in Rivers State?
4. Does motivation predict improvisation instructional materials among secondary school students in Rivers State?
5. To what extent do attitude, interest, self-concept, self-efficacy and motivation jointly predict improvisation instructional materials among secondary school students in Rivers State?

### **Hypotheses**

The following hypotheses guided the study and were tested at 0.05 level of significance.

1. Attitude does not significantly predict improvisation instructional materials among secondary school students in Rivers State.
2. Interest does not significantly predict improvisation instructional materials among secondary school students in Rivers State.
3. Self-concept does not significantly predict improvisation instructional materials among secondary school students in Rivers State.
4. Motivation does not significantly predict improvisation instructional materials among secondary school students in Rivers State.
5. Attitude, interest, self-concept, self-efficacy and motivation do not jointly predict improvisation instructional materials among secondary school students in Rivers State.

### **Methodology**

The design for this study is a correlational research design. The population of the study consists of all secondary school teachers in public schools in Rivers State. Currently, there are 13,764 teachers in the 271 Public secondary Schools in Rivers State. A sample of 504 teachers, which

constitute 20% of the population. A multi-stage sampling technique was used for this study. Two instruments designed by the researcher were used to generate information for this study. They are: Psychological Predictor Scale (PPS) and Instructional Materials Improvisation Scale (IMIS). To ensure the reliability of the instruments Cronbach alpha ( $\alpha$ ) technique was used for both the instruments. Copies of the instruments were administered on 30 teachers who was not part of the sample for the study and then after the scores obtained was subjected to Cronbach alpha technique. The alpha coefficients of 0.75, 0.82, 0.67, 0.74 and 0.77 was obtained for the attitude, interest, self-concept, motivation instructional material respectively. The researcher administered copies of the instruments with help of research assistance to the respondents. Simple regression was used to answer question one to four while multiple regression was used to answer the research question 5. Hypotheses one to 4 was tested using ANOVA associated with simple regression while hypothesis six was tested using ANOVA associated with multiple regression.

## Results

**Research Question One:** To what extent does attitude predict improvisation instructional materials among secondary school students in Rivers State?

**Hypothesis One:** Attitude does not significantly predict improvisation instructional materials among secondary school students in Rivers State.

**Table 1** Linear regression coefficient of attitude on improvisation instructional materials

		R = 0.021		R <sup>2</sup> = 0.000		Adj R <sup>2</sup> = 0.022	
Model		Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	14.050	1	14.050	1.643	0.020	
	Residual	1693.470	502	8.553			
	Total	1707.520	504				

From the analysis shown in table 1, it can be observed that when a simple linear regression coefficient was conducted on improvisation instructional materials and attitude, an R value of 0.021, with an R<sup>2</sup> of 0.000 and an adjusted R<sup>2</sup> of -0.022. From this result, it can be seen that from the adjusted R<sup>2</sup> value, attitude did account 2.2% variation on the improvisation instructional materials among secondary school students in Rivers State. When this value was subjected to an ANOVA analysis associated with simple regression, an F-Value of 1.643 was obtained at 1 and 502 degrees of freedom with a p-value of 0.020 which was less than the

chosen alpha of 0.05. This result therefore indicates that independently, attitude does significantly predict improvisation instructional materials among secondary school students in Rivers State. The null hypothesis was therefore rejected.

**Research Question Two:** To what extent does interest predict improvisation instructional materials among secondary school students in Rivers State?

**Hypothesis Two:** Interest does not significantly predict improvisation instructional materials among secondary school students in Rivers State.

**Table 2 Linear regression coefficient of interest on improvisation instructional materials**

R = 0.182		R <sup>2</sup> = 0.033		Adj R <sup>2</sup> = 0.031		
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	2.622	1	2.622	0.304	0.042
	Residual	1704.898	502	8.611		
	Total	1707.520	503			

Data presentation on the prediction of interest on teachers improvisation of instructional materials of teachers showed that an R value of 0.182 was gotten with an R<sup>2</sup> value of 0.033 and an adjusted R<sup>2</sup> of 0.031. On the basis of the adjusted R<sup>2</sup> value obtained, it can be seen that interest accounted for 3.1% variation in the improvisation instructional materials among secondary school students in Rivers State. When this value was subjected to an ANOVA associated with simple regression, an F-value of 0.304 was obtained at 1 and 502 degrees of freedom, with an associated p-value of 0.042 which was lesser than the chosen alpha for the study, 0.05. This result showed that interest had a significant independent predict improvisation instructional materials among secondary school students in Rivers State. The null hypothesis was therefore rejected.

**Research Question Three:** Does self-concept predict improvisation instructional materials among secondary school students in Rivers State?

**Hypothesis Three:** Self-concept does not significantly predict improvisation instructional materials among secondary school students in Rivers State.

**Table 3** Linear regression coefficient of self-concept on improvisation instructional materials

R = 0.154		R <sup>2</sup> = 0.024		Adj R <sup>2</sup> = 0.021		
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	9.887	1	9.887	1.153	.024
	Residual	1697.633	502	8.574		
	Total	1707.520	503			

According to the result displayed in table 3, a simple regression coefficient of 0.024 was gotten from the independent contribution of self-concept on improvisation instructional materials. From the same table, it was shown that an R<sup>2</sup> of 0.024 was gotten, with a corresponding Adj R<sup>2</sup> of 0.021. On the basis of the Adj R<sup>2</sup>, it therefore implies that 2.1% of teachers improvisation of instructional materials among in Rivers State. These values obtained were further subjected to ANOVA associated with simple regression to test their significance. The result obtained showed an F-value of 1.153 at 1 and 502 degrees of freedom, with an associated p-value of 0.024, which was less than the chosen alpha of 0.05. This result therefore suggests that the self-concept do significantly predict improvisation instructional materials among secondary school students in Rivers State. The null hypothesis was therefore rejected.

**Research Question Four:** Does motivation predict improvisation instructional materials among secondary school students in Rivers State?

**Hypothesis Four:** Motivation does not significantly predict improvisation instructional materials among secondary school students in Rivers State.

**Table 4** Linear regression coefficient of motivation on improvisation instructional materials

R = 0.044		R <sup>2</sup> = 0.002		Adj R <sup>2</sup> = -0.014		
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	4.764	1	4.764	0.554	.002
	Residual	1702.756	502	8.600		
	Total	1707.520	503			

From the analysis shown in table 4, it can be observed that when teachers' response on motivation were regressed against their scores on teachers improvisation of instructional materials, it was seen that an R value of 0.044 was gotten with an  $R^2$  value of 0.002 with an adjusted  $R^2$  value of -0.001. The adjusted  $R^2$  value of -0.002 showed that motivation accounted for only 0.14% variation in their improvisation instructional materials. This result showed that motivation had a very low prediction on the improvisation instructional materials among secondary school students in Rivers State. Further analysis using ANOVA associated with simple regression yielded an F-value of 0.554 at 1 and 502 degrees of freedom which showed a p-value of 0.002, less than 0.05 the chosen alpha for the study. This result therefore suggested that motivation had a significant independent prediction of improvisation instructional materials among secondary school students in Rivers State. The null hypothesis was therefore rejected.

**Research Question Five:** To what extent do attitude, interest, self-concept, self-efficacy and motivation do predict improvisation instructional materials among secondary school students in Rivers State?

**Hypothesis Five:** Attitude, interest, self-concept, self-efficacy and motivation do not jointly predict improvisation instructional materials among secondary school students in Rivers State.

**Table 5: Multiple regression coefficient of attitude, interest, self-concept, self-efficacy and motivation on teachers improvisation of instructional materials**

R = 0.531 $R^2 = 0.301$ Adj $R^2 = 0.461$					
Model	Sum of Squares	df	Mean Square	F	Sig
Regression	7342.670	4	1223.778	12.065	0.0005
Residual	68060.816	499	101.432		
Total	75403.487	503			

According to the result displayed in table 5, a multiple regression coefficient of 0.531 was gotten from the joint contribution of attitude, interest, self-concept, self-efficacy and motivation on improvisation instructional materials. From the same table, it was shown that an  $R^2$  of 0.301 was gotten, with a corresponding Adj  $R^2$  of 0.461. On the basis of the Adj  $R^2$ , it

therefore implies that 46.1% of teachers improvisation of instructional materials among secondary school teachers in Rivers State can be explained by the joint contribution of Attitude, interest, self-concept, self-efficacy and motivation. The remaining 53.9% can be attributed to other factors such as personality, type of school, school environment, etc. These values obtained were further subjected to ANOVA associated with multiple regression to test their significance. The result obtained showed an F-value of 12.065 at 1 and 499 degrees of freedom, with an associated p-value of 0.0005, which was lesser than the chosen alpha of 0.05. This result therefore suggests that attitude, interest, self-concept, self-efficacy and had a significant joint contribution on improvisation instructional materials among secondary school students in Rivers State. The null hypothesis was therefore rejected.

### **Summary of the Findings**

From the analysis conducted and the result presented in the tables, the major findings obtained are summarized below

1. Attitude independently, does significantly predict improvisation instructional materials among secondary school students in Rivers State. The prediction is statistically significant at 0.5 level of significance.
2. Interest independently, does significantly predict improvisation instructional materials among secondary school students in Rivers State. The prediction is statistically significant at 0.5 level of significance.
3. Self-concept independently, does significantly predict improvisation instructional materials among secondary school students in Rivers State. The prediction is statistically significant at 0.5 level of significance.
4. Motivation independently, does significantly predict improvisation instructional materials among secondary school students in Rivers State. The prediction is statistically significant at 0.5 level of significance.
5. Attitude, interest, self-concept, self-efficacy and motivation had a significant joint contribution on improvisation instructional materials among secondary school students in Rivers State. The prediction is statistically significant at 0.5 level of significance.

### **Discussion of Results**

From the analysis of research question one, it was shown that attitude significantly predict teachers improvisation of instructional materials. This result implies that attitude does contribute towards improvisation instructional materials among secondary school students in Rivers State. From the result as shown in table 1, teacher's responses on attitude did contribute

a greater percentage change in the level teacher's improvised instructional materials. The finding from this result is not surprising to this researcher but expected, this is because this attitude is often someone predisposition towards something, meaning that the way an individual feeling about something will determine the extent to which the person will participate in such. Furthermore, if a teacher feels that it is important to teach with instructional material, it will now determine the extent to which he/she will be committed to improvise it.

The result from this study is similar to that obtained by Whitecomb (2013) who examine the extent to which improvisational activities were occurring in the participants' elementary general music classrooms, the nature of these improvisational activities, and participants' perceptions of the quality of their students' improvisations. Despite this similarity, the finding from both study differed in that the sample size used varied.

From the analysis of research question two and the corresponding null hypothesis, it was shown that interest had a little significant contribution on the improvisation instructional materials among secondary school students in Rivers State. This result was deduced because when the prediction of interest on improvisation instructional materials was investigated, it was shown that over about 3.1% variation in teachers improvisation of instructional materials can be attributed to the perceived influence of interest. This result is not surprising, but expected because interest comes in when one attaches importance to something, when some do not regard anything his interest will not be there because his mind is not there. Meaning that some teachers do not attach importance to instructional materials that is while their input in improvising it is very low. Interest has a lot to do in whatever thing we do in life. So interest predicting teacher's improvisation of instructional materials is expected.

The result from this study is similar to that obtained by Whitecomb (2013) who examined the extent to which improvisational activities were occurring in the participants' elementary general music classrooms, the nature of these improvisational activities, and participants' perceptions of the quality of their students' improvisations, differences exist in the statistical approach used. While they used Pearsons Product Moment Correlation in their study, the present study used simple linear regression as the statistical analysis tool.

From the data presented in table 3, Self-concept independently, does significantly predict improvisation instructional materials among secondary school students in Rivers State. This result implies that students who scored highly on the section of self-concept are prone to score low in their disposition towards improvisation of instructional materials. However, the reported result of independent prediction of self-concept on improvisation instructional materials among

secondary school students in Rivers State indicates that not all those who score high in self-concept also scored high in their improvisation of instructional materials. The result that self-concept predicts teachers improvisation of instructional materials is not surprising to this researcher because when a teacher have a negative self-concept about his ability he or she will not be able to improvised. This result is in agreement with that obtained by Onoja (2017) who investigated the factors hindering effective production and utilization of teacher-made instructional materials for teaching senior secondary school chemistry in Federal Capital Territory (FCT), Abuja. However the statistical technique used were different in that while the present study used simple regression statistics, his study used factorial multivariate analysis of variance.

From the analysis of the independent prediction of motivation on improvisation instructional materials, it was shown that motivation do significantly predict teacher's of improvisation of instructional materials. The meaning of this result is that motivation teachers who are motivated intend to be more productive in there are of improvisation of instructional material than those who are not. The result from this study is not surprising but expected. This is because motivation is always a driving force towards whatever someone does, so a teacher who is not motivated cannot have a positive predisposition towards improvisation of instructional materials. This result is in agreement with that obtained by Onoja (2017) who investigate the factors hindering effective production and utilization of teacher-made instructional materials for teaching senior secondary school chemistry in Federal Capital Territory (FCT), Abuja.

### **Conclusion**

The findings of this study have provided the basis for the researcher to draw the conclusion that certain psychological variables such as Attitude, interest, self-concept, self-efficacy and motivation do predict improvisation of instructional materials. The researchers also conclude that factors that hinder effective improvisation of instructional metrical are significant. In conclusion, all stakeholders in education are called upon to intensify efforts towards the production and utilization of teacher made instructional materials for effective teaching and learning in secondary schools in Rivers State.

### **Recommendations**

Based on the findings of the study the following recommendations will be made:

1. Training of student–teachers should be reviewed to emphasize knowledge and skills related to the production and use of instructional materials;

2. Adequate fund should be provided for the procurement of tools and materials needed for production of teacher-made instructional materials;
3. Functional workshop for improvisation of instructional materials should be provided in all the senior secondary schools in FCT, Abuja;
5. Stakeholders (Government at various levels and school principals) should ensure that chemistry teachers are adequately motivated to carry-out their professional duties such as improvisation of instructional materials.

### **Contributions to Knowledge**

Besides contributing to the existing literature in this area of study, this study may be the first of its kind to show whether or not attitude, interest, self-concept and motivation predict teachers improvisation of instructional materials in this part of the country to be specific. Also, to the best of the researcher's knowledge this study is the first to establish the prediction of improvisation instructional materials among secondary school students in Rivers State.

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