

Technology in the Era of Functional Creativity: Achieving A's while Having Fun in the Learning of English Language with Digital Instructional Materials

Udoye, Ngozi T. Ph.D.

Department of Educational Foundations, Faculty of Education
Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria

Abstract: Creativity is functional when it targets at developing problem-solving and critical-thinking skills within the creative persons. Functional creativity assures quality for any worthwhile education. The researcher studied the use of technology, as instructional materials, in the developing of functional creativity among students in their English Language classrooms. The researcher used mixed methods that incorporated Action research model. Two school types, namely private ($N = 240$) and public ($N = 240$), were used for demonstration over a period of two consecutive months in the 1st Term. 16 English Language classroom teachers of Junior Secondary School Two (JSS II) were selected through simple ballot from Aguata, Njikoka and Ogidi Education Zones in Anambra State. These teachers were trained as research assistants. All the students in the selected classes participated ($N = 482$). Class registers, in alphabetical sequence, were used to compute 480 participants' data. PowerPoint (PPT) animations, recording devices, Ipad, visual organizers and soft-materials such as programming and investments were used in instruction deliveries. Controlling for possible confounding variables such as cognitive ability, use of English language at homes and pre-existing knowledge of technology, analysis of covariance (ANCOVA) report revealed that use of digital instructional materials had significant effect on the achieved scores of participants $F_{(1, 477)} = 104.24$; $p < .0005$; partial $\eta^2 = .18$. The researcher observed that students were eager to tackle difficult reading problems as long as they were being aided by animations and audio-visual recording devices. Bi-weekly reports of participants' vocabulary-banking revealed significant increase in the sixth week with a mean score of 4.042_{vocabs} = private, and 4.583_{vocabs} = public. Among other things, the researcher recommended that technology based instructional materials be used, in order to engage students' interest and tap into developing their functional creativity.

Keywords: functional creativity, instructional materials, digital learning, English Language skills

1. Introduction

Gone are the days when scholars thought or spoke of creativity as an ideological concept whose phenomenological impact is only felt in the realms of cognition. Creativity is a scientific art of producing thoughts or solving problems that are novel and useful for the most part in relation to the creativity for which the thinking, event or situation occurs. Creativity is not general as *g-intelligence* is. It is domain specific and concretely field dependent (Gardner, 1999). The tendency for creativity to be functional depends on its problem-solving potentials.

Creativity shows through thinking and behaviour. For the greater part, the use of relational English language for secondary school students is done in the school environment where thinking and behaviours are shown in unrestricted ways. Students' creativity is mostly shown in structured learning environment such as classrooms. Generally, there are four cardinal styles of thinking. These include imaginative thinking, contemplative thinking, goal-directed thinking, and general problem-solving thinking (Woolfolk, 2012; Phye, 1997).

Creativity engages all the four aspects of human thinking in order for it to produce what could be termed novel in problem solving or problem creating. When a student can use English language in any of the four thinking styles positively, particularly for goal-directed and in general

problem solving situations, such a student can be said to engage in a functional creativity. Students are co-creators of their environmental language as they regenerate aspects of their personal technology language to keep abreast with their in-thing (Udoye, 2019). 20th century scholars had earlier imagined that students shaped and reshaped their thinking behaviour until a full circle was formed in solving of the existing problem or creating a new problem (Dewey & Bentley, 1949).

Creativity is functional when it targets at developing problem-solving and critical-thinking skills within the individuals regarded as creative. It is said that creativity is functional when the creative thinking or behaviour where withal is yielding positive results on the society or environment. Functional creativity assures quality for any worthwhile learning. Why would anyone learn if not to make use of what is learned? Even if the motivation is very internal, no one learns for no reason, otherwise such material would not be termed *learned*.

English is the official language in Nigeria. This means that English is used by the government, for politics, national economics and commerce, and communicating between 250+ languages in the nation. Therefore, English is the medium of education and testing in all standard or non-standard examinations. It is a language of thinking – critical or not, and it is a language of problem-solving – creative or not, particularly at the national and international levels, for

Volume 8 Issue 11, November 2019

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

most Nigerians. The students learn English as a functional language to pass tests, benefit from further education, get a job, fit into work-force, communicate with wider literate circle of Nigerians, and 'speak' as smartly as educated.

Training students for functional creativity in the learning of English language is a wholistic education, and using technology for such education keeps the Nigerian students abreast with their counterparts elsewhere in the global village. For instance, knowing a word or vocabulary means knowing how to use such word (vocabulary) in its contextual understanding and articulating the word's role in a problem situation. The implication of the just stated fact is that additional or experiential knowledge may be required for the understanding and application of the known vocabulary in problem solving situation. Hence this researcher does not in any way suggest or claim that once a student knows English language in the use of technology, student automatically achieves A's in the or any subject matter.

Technology is concrete although some reasoning in its use may include formal operational engagements requiring critical thinking and creative problem solving (Mayer, 2001). Junior secondary school (JSS) students are entering Piaget's formal operational stage having just left the concrete operational level. JSS stage is a good stage to introduce the use of technology for the development of such cognitive abilities as concept formation, creativity, vocabulary investments, intellectual-flexibility in problem solving and language sophistication for critical thinking.

There are three functions of technology as used in the classroom: it is the teacher, it is the learner aid, and it is the examiner. As a teacher, technology could be by the classroom teacher, peer or self. As learner aid, technology could be any material targeting to engage the learner's optimal attention. As the examiner, technology could be a person-examiner, machine-examiner, peer or self. Use of digital instructional materials in the educational bictivity of teaching and learning English language has been found to be learning enhanced for Nigerian nation building (Evoh, 2007). Darling-Hammond (2005) organizes four elements around which instruction is planned. First is the nature of the subject-matter and mastery of it. Second is the learner-differences in class. Third is the context of instruction. Fourth is the teacher's role before, during and after the instruction delivery. All these elements require proper selection of digital instructional material for learning aid.

Instructional materials with sound, images, pictures, texts and animations captivate and engage students' attention (Udoye, Onukafor & Chukwuma, 2018). These materials prolong the learning tasks of students' working memory, such that elaboration and storage in the long term memory is greatly enhanced (Udoye, et al. 2018). Use of technology is natural to the students when used effectively in the classroom. In this 21st century schooling, technology is considered an indispensable aspect of worthwhile educational endeavours.

At the dawn of computer usage in the classrooms, teachers feared that their important prestigious teaching profession

and academic role would be hijacked by 'Mr. Technology'. After more than half a century of technology boom, the fears are gone to rest. Teachers are now eager to find ways of using technology to enhance instruction and learning for students. Ahmadi (2018) believes that teachers are beginning to regard technology as a 'significant part of providing high quality education'. He also suggests that in as much as technology is an integral part of a teacher's instructional process, it should be an indispensable tool in the learning process for the students. He concludes that the teacher is a major facilitator in the learning path of students particularly when it involves the use of technology (Ahmadi, 2017).

It is important to note that technology itself is not smart or ingenious. It is the creativity of humans that is programmed in the functioning and the use thereof. Sharndama (2013) notes that it is not the information, communication and technology (ICT) by itself that transforms; it is rather the appropriate use of it by the teacher that helps the students to achieve more. The author believes that technology empowers the teacher to face boldly the challenges of large class size prevalence in Nigerian classrooms (Sharndama, 2013). Akin to that assumption is that students need to be guided so that their use of personal technology does not engage more of their mechanical than logical memory (Udoye, 2019).

In a similar note, Muogbo (2019) discovered in a study that public school teachers are better prepared in the pedagogical practice of subject matter deliver than their counterparts in the private school. The researcher of this study wonders if the public school teachers are equally better prepared in the use of digital instructional materials in the delivery of instruction.

When the role of the teacher is compromised, the students will be more likely to engage in the mechanical-memory use of technology for fun, rather than the logical-memory use of it for work (Udoye, 2019). Concurring with the above, otherscholars support the opinion that technology brings worthwhile learning at the doorsteps of students, particularly in the language learning (Bull & Ma, 2001; Tomlison, 2009; Gencelter, 2015).

Using digital instructional materials has been found to influence secondary school students' learning behaviours such that very arduous learning tasks are made easy, and students achieve their best. Using technology for functional creativity in the learning of English does not mean that computers do the programmed thinking and students just follow the robotic reasoning. Instead, using technology to learn English gives some control to students as they take charge of their learning.

Changes are constantly evolving and rapidly so. This is because of the presence of technology. Functional creativity prepares the student to meet the concept of life-long learning in the rapidly changing world. Functional creativity trains the student in the apt of being capable of solving problems and facing challenges in the rapidly changing world resulted by technology (Okoro, 2019). According to Kerimbaeva, Niyazova and Kaya (2017) technology seems not to affect major changes in the use of English language. Instead, the

authors opine that the use of technology perfects the use of English and makes it the world's broadest used language.

English language learning like any major human means of communication enlists two pairs of skills, namely listening and reading, and speaking and writing. Except when reading is voiced out loud, the first pair of *listening* and *reading* is covert which the researcher refers to as internal language. The second pair of *speaking* and *writing* is overt which is termed external language. While listening is an internal coding of language, reading is an internal output of what has been coded. On the other hand, while writing is an external coding of language, speaking is an external output of what has been coded.

Speaking in English means reasoning in the language – the more sophisticated the reasoning is, the more sophisticated the vocabulary and the semantics in their syntactic formation. Every Nigerian student is required to master and is tested in four skills of English language, namely reading, writing, listening and speaking. Offorma, (2019) emphasizes that listening and speaking should be the emphases in the learning of English. However, experience shows that reading and writing are more emphasized during teacher-made and standardized tests given to the students in the language.

Two questions were crafted to enable the researcher in the conducting of this study.

- 1) How do private and public schools compare in their use of digital instructional materials to learn English language?
- 2) What is the effect of technology use on the students' learning of English language in the classroom?

Also, the researcher used the following hypotheses to test for probabilities. The hypotheses are null, tested at $p\text{-value} \leq .05$ level of significance.

- 1) H_0 There is no significant difference between private and public schools in their use of digital instructional materials to learn English.
- 2) H_0 Technology has no significant effect on the students' learning of English language in the classroom.

2. Method

Action research model was used to design this study. The researcher used techniques such as observations, instruction-times, interviews and tests. Two school types, namely private ($N = 240$) and public ($N = 240$), were used for demonstration over a period of two consecutive months in the 1st Term. 16 English Language classroom teachers of Junior Secondary School Two (JSS II) were selected through simple ballot from Aguata, Njikoka and Ogidi Education Zones in Anambra State.

The sampled English teachers were trained as research assistants. All the students in the selected classes participated ($N = 482$) in order to enable all students to benefit from the Action research. Class registers, in alphabetical sequence, were used to compute 480 participants' data providing equality in the sampling from the two school types.

PowerPoint (PPT) animations, recording devices, Ipad, visual organizers and soft-materials such as programming and *investments* were used in instruction deliveries.

Below is a sample of items used for participants' vocabulary Banking

Consonant Day: proclivity, tit-for-tat, graceful, brat, complement, treachery, quake, broth, travel, fidelity, groan, guttural, debit, credit, complementarity, and so on.

Vowel Day: expedient, abeyance, arduous, invest, abreast, aboard, a cappella, articulate, officious, augment, ubiquitous, and so on.

These were measured in terms of: 1) *accuracy in contextual use*, 2) *correct pronunciation*, and 3) *Number of attempts before correct pronunciation*. The sum of these is entered for the student.

3. Result

In Table 1 below, analysis revealed that Private school students had higher mean score increase than Public school students in the language tests at the end of the experiment. However, the mean score of vocabulary investments of Public school students slightly ranks higher than that of their counterpart at the end of the experiment.

Table 1: Statistics of Private and Public School in their Before and After the Experiment

	Pri_Pub Sch	N	Mean	S.D.	S.E. Mean
PreEnglScores	Private	240	46.2458	8.94953	.57769
	Public	240	52.2958	8.57407	.55345
PostEnglScores	Private	240	64.5250	5.40798	.34908
	Public	240	62.6000	6.01866	.38850
PreVocabCredit	Private	240	1.1042	.65455	.04225
	Public	240	.6667	.68862	.04445
PostVocabCredit	Private	240	12.0208	2.50931	.16198
	Public	240	12.7708	2.98700	.19281

Bi-weekly reports of participants' vocabulary-banking revealed significant increase in the sixth week with a mean score of $4.042_{\text{vocabs}} = \text{private}$, and $4.583_{\text{vocabs}} = \text{public}$ (see Figure 1). Also there was significant difference between the public and private school students in the technology effect on their English learning. Post-English scores: $t = 3.69$, $df =$

478 , $p = .0005$; Post-Vocab Credit: $t = -3.0$, $df = 478$, $p = .003$.

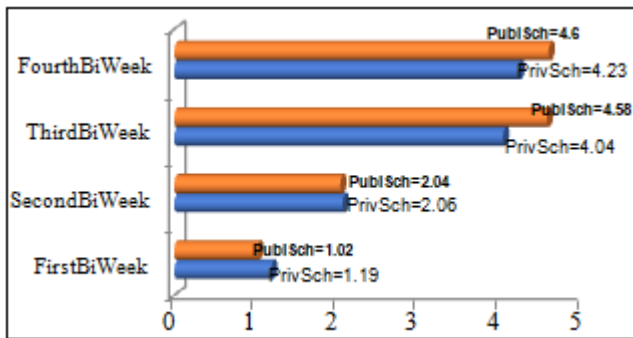


Figure I: Bi-Weekly Report of the Groups' Investments

In answer to research question two, it was discovered that private and public groups' mean English scores and their mean Vocabulary credits increased at the end of the experiment (see Table 1).

Controlling for possible pre-existing abilities and knowledge such as use of English language at homes and knowledge of technology, a test of homogeneity of regression was checked. This assured the researcher that pre-existing learner difference was not a confounding variable among the groups. Hence, analysis of covariance (ANCOVA) was used which revealed that use of digital instructional materials had significant effect on the achieved scores of participants $F_{(1, 477)} = 104.24$; $p < .0005$; partial $\eta^2 = .18$. Further interpretation from the computation revealed that while private school students' mean score topped that of the public school students', the latter had higher mean increase than their counterparts according to the third bi-week reports.

Table 2: ANCOVA Tests of Technology Effects on English Learning in Public/Private School Type

Dependent Variable: ThirdBiWeek						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta ²
Corrected Model	131.958 ^a	2	65.979	149.038	.000	.385
Intercept	785.295	1	785.295	1773.884	.000	.788
FirstBiWeek	96.750	1	96.750	218.545	.071	.314
SchoolType	46.145	1	46.145	104.235	.000	.179
Error	211.167	477	.443			
Total	9270.000	480				
Corrected Total	343.125	479				

a. R Squared = .385 (Adjusted R Squared = .382)

4. Discussion

The four skills of English language learning were studied in this research. It is evident from this study that vocabulary building is experiential. Students learned more when they watched clips of drama that incorporated all the vocabulary items and learning tasks at the beginning of the week. They found it very exciting to go to the vocabulary bank and invest their learned materials. Students were eager to try difficult learning tasks when they saw and heard their teacher or the researcher on the power point animations. The harder learning tasks attracted higher number points. Students made creative efforts to earn more points.

From the study, private school students demonstrated greater understanding in the paper-pencil test of English language

conducted at the end of the study. It surprised the researcher and the teachers to note that public schools had greater pre-existing knowledge of the subject-matter. This agrees with Muogbo's (2019) assertion that what the public students need is more exposure to learning materials. When both groups were exposed to use of technology such as computer and cell-phones, their mean scores in tests and vocabulary investments increased favouring public schools.

Language gets better by use. While writing and speaking have behavioural attributes that make them active in their exhibition, listening and reading are passive as they have cognitive characteristics that render them covert in nature. This study exposed students to hands-on experiential learning in speaking and listening skills which provide students with experiences needed in the appropriate coding of the language. During the study it was discovered that students needed other domain specific knowledge in order to decode even the simplest words. As part of using English language in the study, these three word algebra problems were presented to the students:

- 1) What is the difference between 126 and 27?
- 2) What is the product of 24 and 7?
- 3) Tony and Agnes have age difference of 5. Also, the product of their ages is 266. How old are they?

Students who knew the operational symbol of the words 'difference' and 'product' solved the Math problems right away. The third problem was solved by a few who knew the quadratic equations from word algebra. After the participants were exposed to scientific calculator, students who were savvy in digital materials solved the problems in less than one minute.

Students entertained themselves with many giggles at the introduction of new digital materials for learning aid. But soon, it was discovered that recorded audio devices and animated audio-visual skits helped them learn faster. They were eager to use learned words/vocabularies in correct contexts to see if that would earn credit points for them.

5. Conclusion

If teachers target at training students who will become functionally creative, it means they are preparing citizens who will be self-reliant, competent, society's thinkers and problem solvers. Education provided to such students must reflect in the curriculum and the means of training. Technology is the in-thing; therefore, it is an indispensable material in the curriculum delivery, in the training of students for functional creativity through the medium of English language. Technology is fun for most Nigerian students, but the appropriate use of it in learning, such as English, can combine fun and work for these students.

It is worth to reiterate that the English language learned in school – with or without technology – does not provide a template for a one-size-fits-all repertoire of day-to-day problem solving. Nonetheless, it is noteworthy to recapture, as found in this study, that the more vocabularies a student stores in the 'memory-bank' of the long-term, the more chances there are for such student to attend to problems coded in this language.

6. Recommendation

- 1) The researcher recommends that technology based instructional materials be tailored to suit the subject-matter because technology use is domain specific. The hope is that this will engage students' interest and tap into developing their functional creativity.
- 2) The government could train English language teachers in the use of technology for teaching, learning and assessments in the classroom. This would train natural testing and problem-solving ability with technology in them.
- 3) Regular use of technology as digital learning materials in the classrooms would reduce stress and help students tackle perceived arduous tasks. Hence, teachers are strongly recommended to use digital learning materials.

References

- [1] Ahmadi, M. R. (2017). The impact of motivation on reading comprehension. *International Journal of Research in English Education*. <https://www.ijreeonline.com>. Retrieved on August, 2019.
- [2] Ahmadi, M. R. (2018). The use of technology in English language learning: A literature review. *International Journal of Research in English Language*, 3(2), 115–125.
- [3] Bull, S. & Ma, Y. (2001). Raising learner awareness of language learning strategies in situations of limited resources. *Interactive Learning Environments*, 9(2), 171–200.
- [4] Dewey, J. & Bentley, A. (1949). *Knowing and the Known*. Boston: Beacon Press.
- [5] Evoh, C. (2007). Policy networks and the transformation of secondary education through information communication technologies in Africa: The prospects and challenges of the NEPAD e-schools initiatives. *International Journal of Education and Development Using Information Communication and Technology*, 3(1), 64–84.
- [6] Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York; Basic Books Publishers.
- [7] Gencelter, B. (2015). How does technology affect language learning process at an early age? *Procedia – Social and Behavioural Sciences*, 199(7), 311–316.
- [8] Kerimbaeva, B. T., Niyazova, G. T. & Kaya, K. (2017). The role of computer technology in teaching English language. *Journal of Information in Education*, 14(1), 108–113.
- [9] Mayer, R. E. (2001). *Multimedia learning*. New York: Cambridge University Press.
- [10] Muogbo, O. C. (2019). Parental perception of public and private UBE school teachers' pedagogical practices in Nnewi Education Zone of Anambra State. *Unpublished Masters Thesis at Chukwuemeka Odumegwu Ojukwu University*. Igbariam, Anambra State: COOU.
- [11] Offorma, G. C. (2019). Language education and the speaking skills. In U. M. O. Ivowi (Editor), *Educating for Functionality: NAE Book of Readings in Honour of Emeritus Prof. P. A. I. Obanya*, (pp. 58–68). Lagos: Foremost Educational Services Ltd.
- [12] Okoro, D. C. U. (2019). Learner-centered education and its functionality. In U. M. O. Ivowi (Editor), *Educating for Functionality: NAE Book of Readings in Honour of Emeritus Prof. P. A. I. Obanya*, (pp. 184–203). Lagos: Foremost Educational Services Ltd.
- [13] Phye, G. D. (1997). *Handbook of academic learning: Construction of knowledge*. San Diego: Academic Press.
- [14] Sharndama, E. C. (2013). Application of ICTs in teaching and learning English in large classes. *Online Publications of the Faculty of Humanities*, 34–39. Federal University of Wukari, Taraba State, Nigeria.
- [15] Tomlinson, C. A. (2008). The goals of differentiation. *Educational Leadership*, 66(3), 1–6. Retrieved on September 3rd 2019.
- [16] Udoye, N. T. (2019). Mechanical vs. logical memory in the use of personal technology among Nigerian secondary school students. *International Journal of Science and Research*, 8(10), 531–535.