

Integration of Game-Based Instruction into Teaching-Learning Processes in Tertiary Institutions: Significance to 21st Century Education

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Abstract – This study ascertained students’ opinions on whether integration of game-based instruction into teaching/learning processes can serve any significance towards 21st century education for self-reliant efforts in Nigerian universities. A descriptive survey method was utilized for the study. The population was made up of all Educational Technology students of the Department of Curriculum/Teaching in the Faculty of Education in the University of Calabar. A convenient sampling frame was applied to draw 76 respondents for the study. A 15-item questionnaire tagged “Learners’ Perceptions of Integrating Game-Based Instruction and Enhancement of 21st Century Education for Self-Reliant Efforts Questionnaire” (LPIGIECESREQ) was utilized to collect data. Cronbach Alpha was used to estimate the reliability of the instrument. Data analysis was achieved using frequencies and percentages. The finding revealed that students had favourable perceptions concerning integration of game-based instruction as being significant towards enhancing 21st century education for self-reliant efforts. Recommendations included that; lecturers should see the need to integrate more game-based instructional strategies into their teaching-learning processes in class.

Keywords – Game-Based Instruction, Learners’ Perceptions, Education, 21st Century, Self-Reliance.

I. INTRODUCTION

Education for every living being in this 21st century is a necessity due to the ever-changing dynamics of our daily livelihoods. Specifically, based on the perspectives of its education for self-reliance it appears to be even more fundamental to contemporary survival because of its potential to equip learners with certain competencies in line with 21st century skills. Before going into the perspectives of what education for self-reliance implies, it is necessary to have an insight into the concept of 21st century skills. According to the Pacific Policy Research Centre (2010), 21st century skills are those skills which enable an individual to develop the ability to collect and/or retrieve information; organize and manage information; evaluate the quality, relevance, and usefulness of information; generate accurate information using existing resources and enable their self-sufficiency capabilities. The skills, conceptually known as the 4C’s are categorized into the following – critical thinking, communication, collaboration, and creativity.

Education for self-reliance is seen as the development of knowledge, attitude, and skills as well as the feeling of responsibility in the individual to attain self-sufficiency as it emphasizes freedom and independence of the self, encourages creative thinking as well as practical creative transformation activity, transcending to self-emancipation and self-realization (Osalus, 2014). For Ite (2016), education for self-reliance is learning directed towards ensuring that learners acquire those knowledge, skills, competencies, and attributes which equip them with innovative, creative, critical thinking and self-sufficiency capabilities that would make them successfully identify, exploit, harness, and efficiently manage self-employment opportunities to raise life quality, standard of

living and condition of existence.

In Nigeria, the Federal Government of Nigeria [FGN] (2014), section 1 sub-section 5 of the National Policy on Education states that one of country's main national goals is to build a united, strong, and self-reliant nation. Also, section 1 sub-section 9 of the Policy states that "the quality of instruction at all levels of education shall be oriented towards inculcating values which include acquisition of functional skills and competencies necessary for self-reliance". Still from the Policy, section 5 sub-section 81 states that the goals of tertiary education shall include "providing high quality career counseling and lifelong learning programmes that prepare students with the knowledge and skills for self-reliance and the world of work". The above statements from the policy appear to imply that there have actually been efforts focused towards inculcating self-reliant capabilities among learners at the tertiary education level.

From research reports, it appears that education for self-reliant efforts in the country are being hampered by barriers in the teaching-learning process. Ogori and Utim (2013) revealed that the efforts towards enhancing self-reliant capabilities among learners in schools required application of contemporary instructional tools to bring about more effect. Ebinga (2014) evaluated university lecturers' perceptions concerning efforts towards enhancing self-reliance capabilities in Nigerian schools and revealed that the efforts could be more impactful in the event of employing extra use of contemporary technological tools for the teaching-learning process. Though, Johnson, et al, (2021), while x-raying the used of technological tools in education, have also urge usher to exercise cautions as it excessive used might benefit the learners negatively. Osalusi (2014), in her study reported that teachers were mostly pessimistic about efforts towards learners' inculcation of self-reliant capabilities in which utilization of modern technology was not put to use. Imoke, et al, (2021), investigated the use of social media as teaching/learning tool in Nigerian tertiary institutions and the findings revealed that students had favourable perception concerning utilization of social media for education towards driving 21st century inclusive education efforts. For Shamsuddin, et al, (2018), the efforts towards developing education for self-reliance in the country is being partly hampered by issues from the non-integration of e-education processes in class.

Education for self-reliant was an educational philosophy championed in 1967 by Nyerere, a Tanzanian president who was concerned about the rush for government jobs and almost no efforts to exploit self-employment opportunities (Wabike, 2014). The intent of his championing the educational philosophy was that: Education provided must encourage development in each citizen of three things; an enquiring mind; an ability to learn from what others do and reject or adapt to their own needs; and a basic confidence in their own positions as a free and equal member of the society, who values others and is valued by them for what he does and not for what he obtains. (Nyerere, 1968, p. 274).

As a concept, self-reliant refers to an individual's personal initiative in his/her capability and endeavour to identify, sustainably harness and effectively manage whatever opportunities and accompanying resources which he/she can exploit in his/her immediate surroundings with the aim of uplifting the quality of life, standard of living and condition of existence (Evans-Obinna, 2016). This implies that self-reliance could serve to reduce dependency-syndrome on government and its jobs as the monopoly of development in the country. In her position on the premise that education for self-reliance can serve to enhance national development, Risikat (2014) stressed that: A person who is self-reliant is self-sufficient, can think and function independently, is not

risk averse and solves problems rather than worries about them... such a person would trust his own judgment, rarely needing to consult others for advice or guidance... a self-reliant person has better control of his life and can handle any curveball that may throw his way (p. 141).

Game-based instruction is a tool that comprises audio-visual features, animations, videos, and games, as well as enabling interactive learning (Chen, et al, 2019). Instructional games refer to all types of games that can be used to facilitate learning such as: board games, computer games, locally constructed or commercial games, physical games, puzzle games, online games, card games, etc. Instructional games can be used as a support tool to complement traditional teaching methods to improve the learning experience of the learners while also teaching other skills such as following rules, adaptation, problem solving, interaction, critical thinking skills, creativity, teamwork, and good sportsmanship (Zirawaga, et al, 2017). According to Udosen and Ekpo (2016), for a game to be accepted as a medium of instruction it should possess the following features -

- The game designed must support the stated instructional objectives.
- The game must provide opportunity for learners to have meaningful interaction with the learning content.
- The game must provide means for evaluating the learner's performance to see if the intended instructional objectives of the lesson have been achieved.
- The game must provide a means for immediate feedback and the feedback should be given to the learners as soon as possible for corrective measures or remediation.
- The game should be developed based on the ability level of the learners. If the task to be accomplished is too difficult, the students may give up easily and may become bored if it is too easy.

From Boyle (2011), the advantages of using games for instructional purposes include - (i) it facilitates their engagement in the learning process; (ii) it enhances recall capabilities; (iii) it characterizes visual and computer literacy; (iv) it captivates rule following and problem-solving skills; (v) it is beneficial for those with attention disorders, and; (vi) it helps teach other skills. The author also listed the disadvantages include: (a) teachers could be challenged towards providing a platform for learners to play revision games as learners may access other environments that could be detrimental to the learning process; (b) learners who rely on games are often secluded from real life interaction; (c) using computers and other electronic devices can cause health hazards such as eye strain and other physical problems, and; (d) the technologies required for full participation can be quite expensive and this may create a gap between the students who have access to the technologies and those who do not have access.

This study's assumption is as follows - "integration of game-based instruction into teaching-learning process in tertiary institutions can significantly facilitate 21st century education for self-reliant efforts". Thus, the question which this study seeks to answer is "to what extent can integration of game-based instruction facilitate 21st century education for self-reliant efforts in Nigerian tertiary institutions"?

II. LITERATURE REVIEW

Tham and Tham (2012) examined the effectiveness of game-based learning towards engaging and motivating Singaporean higher education students. The findings indicated that game-based learning is very useful towards engaging and motivating students, to learn because challenges in games foster competition between groups and

collaboration within groups. Sowunmi and Aladejana (2013) evaluated the comparative effectiveness of Simulation Games and Computer Assisted Instruction on Nigerian learners' achievement in the sciences and found out that there was no significant difference in the performance of the learners based on their separate exposures to simulation games and computer assisted instruction. Liu and Chen (2013) verified the significance of educational card games on science learning on Taiwanese students' attitudes to learning and revealed that the learners not only developed positive attitudes but also improved in their scientific knowledge.

Using a quasi-experimental design, Akinsola and Frederick-Jonah (2014) surveyed the impacts of game enhanced instruction on students' achievement in mathematics in Nigeria. The results revealed that learners exposed to game enhanced instruction had better mean achievement score than the control groups. Chin and Zakaria (2015) investigate the impact of game-based learning activities on positive learning and pro-social behaviours among young Malaysian learners and the result suggested that the activities were very effective in nurturing each of positive learning and pro-social behaviours. Iwuanyanwu, et al (2016) applied a quasi-experimental approach towards probing the influence of simulation game strategy on performance among Nigerian secondary school students and reported that subjects taught using simulation game strategy performed significantly better than those taught using lecture method.

Ellahi, et al (2016) examined the impact of using digital games on learning among Pakistani undergraduates and observed significant impact of game design on learning outcomes. Fatokun, et al (2016) investigated the effect of games teaching approach on Nigerian chemistry students' achievement and retention. The results showed that those taught using game method achieved and retained better than those taught with the conventional method. Ezeugwu, et al (2016) investigated the effect of game-based instructional technique on achievement and interest of Nigerian students in Algebra at the basic educational level and discovered that use of the technique did have a significant effect on achievement and interest in Algebra. Dreyer (2017) investigated the effect of Game-Based Learning (GBL) in comparison to traditional teaching methods when used to teach South African undergraduate Computer Information Systems (CIS) students and revealed no significant difference between usage of the two methods.

Dele-Ajayi, et al (2019) determined the impact of a digital educational game on interest and engagement with mathematics among Nigerian students. The results showed significant improvements in attitude to and engagement with mathematics in such a way that within a short period of learning with the digital educational game, learners became co-creators of their own knowledge, sharing ideas, forging new learning pathways, competing and cooperating with one another. Cahyana, et al (2017) ascertained the effect of mobile game-based learning (M-GBL) on student learning outcomes in association with student learning independence among Indonesian high school students. M-GBL was found to have a positive effect on students' when applied to groups of students with high learning independence but no positive effect on those with low learning independence.

Okanlawon, et al (2017) verified the relationship between Nigerian secondary school students' attitudes towards instructional games on peace education and their achievement in the subject and reported a significant relationship between the investigated phenomena. Hwa, (2018) surveyed pedagogical change in mathematics learning among Taiwanese students and the findings corroborated with the hypothesis that digital game-based learning is more effective than traditional class-based learning in acquiring mathematical knowledge. Chen, et

al (2019) explored the effects of scenario simulation games and e-textbooks on learning outcomes of young Taiwanese learners and found out that the learning outcomes for those taught with e-textbooks had a less positive effect than those taught with scenario simulation game-based instruction.

III. RESEARCH QUESTION

The following research question was raised for the study:

1. To what extent to what extent can integration of game-based instruction facilitate 21st century education for self-reliant efforts in Nigerian tertiary institutions?

IV. METHODOLOGY

A descriptive survey method was applied for the study. The study was conducted using students of the Faculty of Education (specifically, all students of the Educational Technology unit of the Department of Curriculum and Teaching) in the University of Calabar, Cross River State. All 392 students of the unit (Levels 100-400) constituted the population. A convenient sampling frame was used to draw 76 respondents for the study. A 15-item instrument tagged “Learners’ Perceptions of Integrating Game-Based Instruction and Enhancement of 21st Century Education for Self-Reliant Efforts Questionnaire” (LPIGIECESREQ) was used for data collection and its response rubric consisted of strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD). The instrument was face validated by two experts from the Department of Curriculum and Teaching (Educational Technology Unit) and one expert from measurement and Evaluation Department all from the University of Calabar. Cronbach Alpha was used to estimate the internal consistency which was revealed to be .782. Descriptive statistics (frequencies and percentages) were used for data analysis.

V. RESULTS AND DISCUSSION

The analysis of data in relation to the items of the research question is as follows:

Table 1. Frequencies and percentages of learners’ responses to perceptions of integration of game-based instruction and enhancement of 21st century education for self-reliant efforts.

S/N	Item	SA	A	D	SD
	Integration of game-based instruction into our teaching/learning processes by my lecturers could				
1.	Enhance my learning autonomy	42 (55.3%)	24 (31.5%)	6 (7.9%)	4 (5.3%)
2.	Distract my attention in class	2 (2.6%)	6 (7.9%)	24 (31.6%)	44 (57.9%)
3.	Foster my creative thinking abilities	46 (60.5%)	20 (26.3%)	6 (7.9%)	4 (5.3%)
4.	Reduce my concentration levels in class	2 (2.6%)	4 (5.3%)	22 (28.9%)	48 (63.2%)
5.	Sharpen my practical problem-solving skills	46 (60.5%)	20 (26.3%)	6 (7.9%)	4 (5.3%)
6.	Make me less confident in my self-management potentials	4	8	22	42

S/N	Item	SA	A	D	SD
		(5.3%)	(10.5%)	(28.9%)	(55.3%)
7.	Adopt a culture of seeking innovative ways to solutions	44 (57.9%)	22 (28.9%)	6 (7.9%)	4 (5.3%)
8.	Facilitate my self-sufficiency capacities	46 (60.5%)	20 (26.3%)	6 (7.9%)	4 (5.3%)
9.	More worried towards solving problems as reality is not a game	4 (5.4%)	6 (8.1%)	25 (32.4%)	41 (54.1%)
10.	Imbibe more sportsmanship capabilities	33 (43.1%)	25 (33.6%)	8 (10.8%)	10 (12.5%)
11.	Make me more reliant on peoples' judgement for my personal progress	6 (7.5%)	8 (10.8%)	22 (28.8%)	40 (52.9%)
12.	make me more computer game literate than focus on class work	5 (6.9%)	5 (6.2%)	40 (52.1%)	26 (34.7%)
13.	Make me more engaged in class activities	26 (34.0%)	38 (49.6%)	6 (8.1%)	6 (8.3%)
14.	Develop more positive attitudes to learning activities in class	36 (47.5%)	28 (36.9%)	7 (8.9%)	5 (6.8%)
15.	Improve my retention potentials	37 (48.6%)	26 (34.4%)	6 (7.3%)	7 (9.7%)

Source: Field Survey, 2019.

From Table 1 above, the respondents appear to harbour favourable perceptions towards integration of game-based instruction as being significant towards enhancing 21st century education for self-reliant efforts in Nigerian universities. The responses generally reveal that the learners perceive that integration of game-based instruction can enhance their learning autonomy, foster their creative thinking abilities, sharpen their practical problem-solving skills, facilitate their self-sufficiency capacities, make them more engaged in class activities, develop more positive attitudes to learning activities in class and improve their retention potentials. In addition, based on the negative items, the learners were found to perceive that integration of game-based learning will not distract their attention in class, will not reduce their concentration levels, will not make them less confident in their self-management potentials, will not make them more reliant on others judgement for their personal progress and lastly, will not make them more computer game literate than their focus on class work.

Apparently, the findings imply that the students are of the opinion that integration of game-based instruction into their teaching/learning process can enhance not only their active engagement and participation in contemporary education self-reliant efforts but also seem to reveal that application of the strategies can boost their acquisition of 21st century skills. The findings are in consonance with those of Liu and Chen (2013), Akinsola and Frederick-Jonah (2014), Iwuanyanwu et al., (2016), Ellahi et al., (2016), Fatokun et al., (2016), Ezeugwu et al., (2016), Dele-Ajayi et al., (2017) and Okanlawon et al., (2017) who all revealed that integration of game-based instruction actually served to enhance 21st century education for self-reliant efforts in Nigerian universities.

VI. CONCLUSIONS

The necessity of integrating game-based instructional strategies into the teaching-learning process as a facilitator of 21st century education for self-reliant efforts is imperative to the survival of education for self-reliant efforts in the country. The necessity of integrating game-based instructional strategies into the teaching-learning process can only be better understood when one imagines the ever-increasing number of learners enrolled in schools in recent times. By applying a strategy that can enhance their acquisition of a self-reliant culture, such can enhance the efforts of the education for self-reliance efforts in schools. Noteworthy of mention is that one critical determinant which usually has a profound impact on students' motives towards learning is through an attraction of their interest towards whatever is supposed to be learnt. By using the extent of interest which they have in "game-based interactions", 21st century education for self-reliant efforts in the country could be significantly impacted upon, their 21st century skills could be enhanced, and ultimately, a society more replete with self-reliant members could be attainable.

VII. RECOMMENDATIONS

Based on the findings, the following recommendations are made.

1. Lecturers should see the need to integrate more game-based instructional strategies into their teaching-learning processes in class.
2. Lecturers should also see the need to periodically have interrogative sessions with the learners on which game-based strategies would be ideal to integrate in their learning sessions.
3. School authorities should establish school-based bodies to assist lecturers towards implementing game-based instructional strategies into their teaching-learning processes.

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