Authentic-based multimedia as determinant of learning success among accounting education students in tertiary institutions in southwest nigeria

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Abstract

The rising worldwide technology advancement appears to be stimulating the requirement for university education to create good graduate students for emerging countries to cope with global shifts in the learning environment. Furthermore, since student performance in accounting has remained substandard, high dropout rates and low engagement are ascribed to deficient teaching methods among students, leading in weak thinking reasoning. Likewise, in order to increase students' inventive thinking, engaging technology in educational institutions is demanded, specifically in the disciplines of science and vocational courses. As a result, the purpose of this article is to fill this need by researching an authentic-based multimedia learning environment to promote student engagement in the teaching of accounting education in Nigerian higher education institutions. A sample size of 90 respondents was selected from a total population of 120 undergraduate accounting students for this study. Questionnaire surveys and semi

structured interviews with open-ended questions were used to collect data. The findings of the study have relevance for instructors and administrators who want to promote student engagement in multimedia learning environments in their classes. Future research may focus on the challenges in implementing authentic-based multimedia learning by engaging the students. As a conclusion, this article estimates that the federal government, higher education administrators, curriculum designers, and accounting instructors work together to improve student engagement in Nigeria's multimedia learning environment.

Keywords:

Student Engagement; Authentic-based multimedia learning; Student performance.

1　　Introduction

It is no different in the academic community that students and instructors throughout the world are coming up with different and interesting methods to make learning more engaging and relevant to the real world Almara'beh et al. (2015). It signifies that technology is a crucial component of all educational levels and training, including elementary, secondary, higher, and professional education. Over the years, technological tools and methods for aiding teaching and learning from the shortcomings of conventional education methods of learning have played an important part in creating greater order of learning. For this purpose, academic inventors, according to Hunter and O'Brien (2018), have become focused on helping the delivery of student learning by teaching staff, which has resulted in a growing commitment to engage students directly in a variety of academic progress programmes, such as paying attention to their voice on acquiring knowledge into their higher education experiences. As information and communication technology (ICT) has progressed in society, it has influenced home and family life, altering dynamics, behaviours, and societal expectations (Livingstone et al., 2015). Enrique Hinostroza (2018) described that despite this, a considerable number of young people have grown up with digital technology, the Internet, video games, and mobile phones; devices utilised for academic and informal learning, as well as recreational and social activities. As a result, multimedia activities have been integrated into the engagement method of teaching, which will aid in the development of students' cognitive thinking skills during the classroom activities (Wang & Tseng, 2018). Learning challenges are improving with the support of multimedia aids, according to Barker et al. (2016), as students obtain self-management of relevant support. When students are engaged with multimedia technologies, Wu and Yang (2015) asserted that learning becomes practical and entertaining, providing them with a pleasurable strong self-esteem.

Student engagement has grown and been more commonly employed as a technique of dealing with classroom behaviours that have typically centred on increasing achievement, positive behaviour, and being committed among students, allowing them to aim high (Parsons & Taylor, 2011). Several higher education institutions currently employ the expository technique of teaching in the learning

process because they feel it is easier to manage when conveying information to students, yet in the educational sector today, where technology tools have changed the way students learn by allowing them to use software visualisation tools as well as interactive and collaborative learning platforms to engage students, going beyond the conventional way of learning.

1.1 Multimedia authentic-based learning for real-world engagement

Multimedia technologies, based on the most recent current research, have a significant impact on students' learning by broadening their learning and knowledge span. Therefore, Volpe and Gori (2019) identified multimedia as the integration of various forms of digital technology, such as text, videos, motion, and picture, into an integrated interactive multi-sensory application to convey a message or information to an individual, with the goal of encouraging learners to become highly engaged. This implies that it would develop students to be active in their learning environment instead of being passive participant of teaching strategy.

Hence, Ahmadi and Reza (2018) asserted that feedback with interactive, multimedia information between the teacher and the student will give a significant benefit of new learning over traditional learning with the introduction of technology. In order to engage students in accounting education, authentic learning needs them to execute tasks that would be completed in a real-world setting. However, genuine learning environments embracing a wide variety of applications give solutions in the real-world situation with multimedia software packages into accounting education in higher institutions for Planning Process.

Westberg and Leppien (2018) assumed that students will be able to investigate ideas that require learning through the integration of information in real-life circumstances and surroundings, as well as connect with the needs of their broader communities, through authentic learning. As a technology support, the idea of realistic activities will be implemented into the multimedia learning environment, allowing accounting students to apply theoretical knowledge in a real-life situation.

1.2 Current Authentic-based Multimedia Learning Environment Issues

The big challenge, however, is to identify successful ways of developing and exploiting new technologies to improve learning to design excellent multimedia presentations, not only to place emerging technology in our higher education institutions. Besides that, Hui and Koplin (2011) declared that an authentic learning environment should be concerned with just task challenges, accomplishing what they believe in, and connecting the actual world to their learning environment. Though significant work has been done in many sectors over the last decade on

genuine learning, accounting has been disregarded, and the lack of connection and engagement with the use of multimedia approaches to teach students is not being adequately led to aid students in the learning environment.

According to J Herrington et al. (2010), students' study in a genuine learning environment and are involved in exciting and demanding tasks that need collaboration and commitment. As a result, creating a direct closeness to real-world situations, increasing consistency with the use of a mix of audio-visual aids, and focusing on knowledge generates diverse learning environments (Blumberg & Brooks, 2017). In order to achieve successful and productive genuine learning, several prerequisites must be met.

2   The issue of engagement supported by multimedia learning.

Klašnja-Milićević et al. (2018) regarded multimedia as a rising situations in which materials having visual, audio, or visual-audio qualities that appeal to people's verbal and visual perceptions which are combined together. According to Wu and Yang (2015), learning becomes helpful and exciting when students are engaged with multimedia tools that provide them with a pleasurable personality and serve as a complement to face-to-face teaching instructions. This literature review, however, was driven by Mayer's theory of multimedia learning, which highlights the fundamental ideas and concepts employed in the review. Mayer's (2000) Multimedia Theory said that when learners see words and pictures at the same time, they may form both verbal and visual mental frameworks and interact with one another.

Moreover, Multimedia technologies help students to study in a variety of ways in order to obtain more knowledge from instructors in the classroom utilizing films, visuals, and animation, which is hard to do with traditional teaching methods (Yeh, 2018). The advancement of technology has resulted in changes to multimedia learning that are consistent with current imbedded software in order to include students' understanding through multimedia web and improve students' learning views in respective topic (Tulinayo et al., 2018). Thus, the use of multimedia interactive information between the teacher and the student will give a significant benefit of new learning over traditional learning. Gunawardhana (2015) theorised that incorporating multimedia into educational systems in order to design students' tasks may necessitate successful genuine learning in order to boost the use of audio-visual aids and create adaptable learning environments for student achievement.

2.1   Mayer's Multimedia Learning Cognitive Theory

Multimedia theory enabled students learn more from words and pictures than from words alone, despite the fact that the dual delivery of knowledge allows students to construct verbal and pictorial mental models together and build skills between them rather than a verbal or visual mental model alone. Ningsih et al.

(2020) claimed that with a cognitive constructivist approach, the usage of multimedia in the learning process will be able to have a favorable influence on students' creative thinking skills.

Consequence, the concepts are based on multimedia, such as redundancy, modality, personalization, coherence, and contiguity (Fletcher & Tobias, 2005) which allows students to learn using visuals and spoken words rather than printed words, which may damage pupils' visual pathways when giving critical information without the use of on-screen text. Kalyuga and Sweller (2014) examined that when both pictures and words are visually displayed, cognitive load can be increased by including redundant information in both cognitive processing and long-term memory. This explains that visual memory ability can be overloaded when both images and words are visually represented.
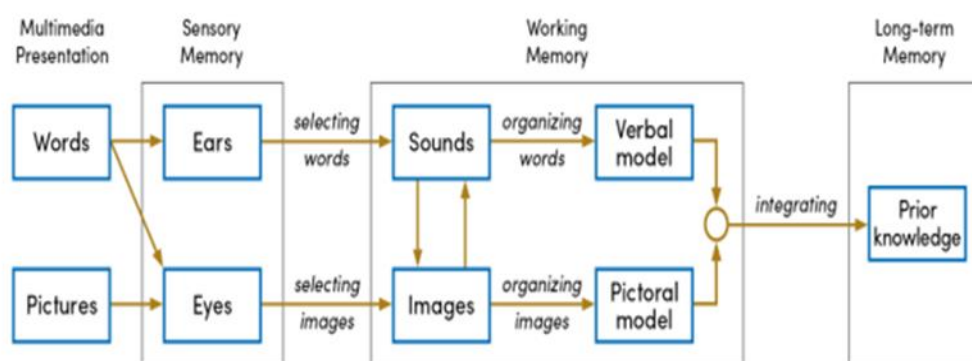

Figure 1.1 *Theory of Mayer's Cognitive multimedia learning (Clark, 2016)*

As a result, these concepts are implemented in the designing of multimedia learning in effective teaching on how students are learning with the concept in order to encourage them with the design of the model, particularly the visual design of cognitive thinking during teamwork. Multimedia is the use of words and pictures (both verbal and visual) to allow students to develop both verbal and graphical mental models and interact with one another to enhance the students' cognitive ability in solving the issues with the medium use of graphics, text, video clips, visual helps to develop their cognitive critical thinking (Ramlatchan, 2019). Regarded to the model of auditory and visual through which students can learn better may be successful on the usage of new instructional technology channelled by authenticity principles impacting their learning environment (Chen & Hua, 2015).

2.2   Engagement through multimedia authentic-based learning

Regarding successful learning outcomes, engaging multimedia learning allows cooperation between students and the learning medium as well as the students' material. Darling-Hammond et al. (2020) found that students participating in the learning environment, on the other hand, will be required to be

engaged with their own learning skills in order to address difficult issues and by promoting the learning process in which they are subjected to several perspectives to accomplish their goals. Therefore, to effectively engage students, the learning environment should be realistic and vital to learn, with planned material and activities that depict how technology is developed in various learning situations (Pu et al., 2016).

As students get more involved in learning and doing, their chances of preserving knowledge and continuing the learning process improve and also, there is a need for a authentic learning environment for pupils in which they will be actively encouraged to explore while developing their processing abilities and engaging in increasingly cognitively demanding tasks. Likewise, Biffi and Woodbury (2018) stated that incorporating multimedia to engage students in a real-world learning environment would aid academic achievement and make assessment easier for students. Radianti et al. (2020) indicated that adopting multimedia as a technology support will help students to apply theoretical information in the actual world by integrating realistic learning techniques to the students, that may also have an influence on their engagement in the learning environment. Moreover, in an authentic learning environment, the teacher employs a range of learning tactics to engage a diverse set of students in the classroom, and is also prepared to try new things to keep the students involved as active learners outside of the classroom. According to J Herrington et al. (2010) a successful and efficient genuine learning environment will promote and provide particular nine components for building the multimedia programme for students' roles. In summary, authentic-based learning is characterized as the approaches used to assign tasks to students and assess their abilities, which are based on information and skills learned in real life scenarios (Suwandi et al., 2019) that comprise the study instrument to be examined for validity and reliability.

Therefore, the aim of study is to produce an authentic-based multimedia learning environment based on the philosophy, concepts, and technology employed in the study's structure. More specifically, the research question and Hypothesis are addressed:

RQ: What is the effect of authentic-based multimedia learning environment on students" performance in test, cognitive engagement level, behavioral engagement level?

Hypothesis: There is no significant effects of authentic-based multimedia learning environment on student's performance in test, cognitive engagement level, behavioral engagement level.

3   Methodology

The study adopted mixed method approach with a purposive sample of 90 undergraduates' students from a public university in south-west geopolitical zone Nigeria. The scales instrument's questionnaire was based on Herrington and Oliver's

(2000) nine main theoretical elements of authentic learning contexts. The questionnaire was conducted for data collection with the use of pre-test and post-test to describe the students' performance test (SPT) while the qualitative data included interview in collecting data from the participants. The questionnaire was subsequently implemented to the final version based on feedback. The questionnaire scales have a 5-point Likert scale, with a 5-point response being the most positive and a 1-point response being the most negative. Positive expression was used in all of the questionnaire's item. Data analysis for the study include the use of descriptive (Mean, percentages, standard deviation, t-test) and inferential (correlation, analysis of variance, co-efficient, regression, p-values) statistics. The validity and reliability of the questionnaire was developed by Cronbach's Alpha Coefficient based on the data collected during the pilot study. A total of five (5) respondents was used for the testing in the pilot sample which is not in the actual study, and the questionnaire was conducted for 20 minutes during the class session.

3.1   Instrumentation

The respondents' data are collected using the same tools that were used to gather data for this study. Pre- and post-tests, interviews, and a questionnaire survey are all employed in this study. On the basis of the quantitative study, the interview technique is then designed to acquire data on sections of the analysis that requires further description. The researcher uses the findings of the pre-test as a reference to assess the students' accounting proficiency and understanding. Respondents were instructed to complete a post-test in order to determine the impact of authentic-based multimedia learning on student engagement. The pre-test and post-test are similar in design, but the wording of the questions in the post-test may be changed to dissuade students from recalling the response they had already provided. As a result, students get a post-test evaluation four weeks following the pre-test evaluation. The Pearson Correlation Coefficient is used to determine the test-retest reliability of the Student Performance Test, which is based on a value of 0.8. (SPT).

4   Results and Findings

The results of the study deal with the analysis of the Quantitative data collected on the research question represented using Mean, t-test and standard deviation analysis. The t-test was carried out to compare the significant difference in responses among accounting education students on each item.

4.1   Research Question

What is the effect of authentic-based multimedia learning environment on students" performance in test, cognitive engagement level, behavioral engagement level?
Table 4.1.1 shows the descriptive analysis of the effects of authentic-based

multimedia learning environment on students' performance in test. From Table 4.1.1, it could be observed through the pretest (prior to treatment) that students in control and experimental groups had performance mean scores 16.27 and 23.70 respectively, while the values of their standard deviation are 6.275 and 5.491 respectively. It could also be observed through the post-test (after being exposed to treatment) that students control and experimental groups had performance means scores of 35.17 and 38.07 respectively while the values of their standard deviation are 11.408 and 18.137 respectively. This indicated that the pretest means scores established the homogeneity of the two groups involved in this study prior to the experiment. By implication, the background knowledge of students prior to the treatment in each of the two groups could be adjudged to be equal. Thus, any improvement recorded later might not be due to chance other than the treatment applied.

Table 4.1.1: Descriptive Analysis of the Effects of Authentic-Based Multimedia Learning Environment on Students' Performance in Test

Methods	N	Pretest		Posttest		Mean Difference	Relative Performance
		Mean	SD	Mean	SD		
Control	45	16.27	6.275	35.17	11.408	18.9	2nd
Authentic-Based Multimedia Learning	45	23.70	5.491	38.07	18.137	14.37	1st

Table 4.1.2 shows the descriptive analysis of the effects of authentic-based multimedia learning environment on students' cognitive engagement level. From Table 4.1.2, it could be observed through the pretest (prior to treatment) that students in control and experimental groups had mean scores 4.92 and 4.35 respectively, while the values of their standard deviation are 2.77 and 1.41 respectively. It could also be observed through the post-test (after being exposed to treatment) that students control and experimental groups had means scores of 8.95 and 22.60 respectively while the values of their standard deviation are 3.10 and 2.13 respectively. This indicated that there was homogeneity of the two groups involved in this study prior to the experiment. By implication, students' cognitive engagement level prior to the treatment in each of the two groups could be adjudged to be equal. Thus, any improvement recorded later might not be due to luck other than the treatment applied.

Table 4.1.2: Descriptive Analysis of the Effects of Authentic-Based Multimedia Learning Environment on Students' Cognitive Engagement Level

Methods	N	Pretest		Posttest		Mean Difference	Relative Performance
		Mean	SD	Mean	SD		
Control	45	4.92	2.77	8.95	3.10	4.03	2nd
Authentic-Based Multimedia Learning	45	4.35	1.41	22.60	2.13	18.25	1st

Table 4.1.3 shows the descriptive analysis of the effects of authentic-based

multimedia learning environment on students' behavioral engagement level. From Table 4.1.3, it could be observed through the pretest (prior to treatment) that students in control and experimental groups had mean scores 6.19 and 5.90 respectively, while the values of their standard deviation are 2.36 and 1.86 respectively. It could also be observed through the post-test (after being exposed to treatment) that students control and experimental groups had means scores of 14.48 and 23.08 respectively while the values of their standard deviation are 4.27 and 3.41 respectively. This indicated that there was homogeneity of the two groups involved in this study prior to the experiment. By implication, students' behavioral engagement level prior to the treatment in each of the two groups could be adjudged to be equal. Thus, any improvement recorded later might not be due to luck other than the treatment applied.

Table 4.1.3: Descriptive Analysis of the Effects of Authentic-Based Multimedia Learning Environment on Students' Behavioral Engagement Level

Methods	N	Pretest		Posttest		Mean Difference	Relative Performance
		Mean	*SD*	*Mean*	*SD*		
Control	45	6.19	2.36	14.48	4.27	8.29	2nd
Authentic-Based Multimedia Learning	45	5.90	1.86	23.08	3.41	17.18	1st

Therefore, in order the test the hypothesis 1: There is no significant effects of authentic-based multimedia learning environment on student's performance in test.

Table 4.2 is produced to show the effect of authentic based multimedia learning environment on students' performance in test. The result in Table 4.2 shows that ($F_{2,86}$ = 44.808, p = 0.000 < 0.05). Since the P-value is less than 0.05, the hypothesis is thus rejected. This implies that, there is significant effects of authentic-based multimedia learning environment on student's performance in test.

Table 4.2: ANCOVA showing Effects of Authentic-Based Multimedia Learning Environment on Student's Performance in Test

Source	SS	df	MS	F	P
Corrected Model	23582.693	3	7860.898	30.200	.000
Covariate (Pretest)	19483.418	1	19483.418	74.852	.000
Group	23326.196	2	11663.098	44.808*	.000
Error	21864.580	86	260.293		
Total	248968.000	90			
Corrected Total	45447.273	89			

*p<0.05 (Significant result)

4.3 Hypothesis 2: There is no significant effects of authentic-based

multimedia learning environment on student's cognitive engagement level.

In order to test the hypothesis, Table 4.3 is produced to show the effect of authentic based multimedia learning environment on students' cognitive engagement level. The result in Table 4.3 shows that ($F_{2, 86}$ = 529.45, p = 0.000 < 0.05). Since the P-value is less than 0.05, the hypothesis is thus rejected. This implies that, there is significant effects of authentic-based multimedia learning environment on student's cognitive engagement level.

Table 4.3: ANCOVA showing Effects of Authentic-Based Multimedia Learning Environment on Student's Cognitive Engagement Level

Source	SS	df	MS	F	P
Corrected Model	3.770.06	3	942.52	139.18	.000
Covariate (Pretest)	29.79	1	29.79	4.40	.040
Group	3585.38	2	3585.38	529.45*	.000
Error	507.89	86	6.77		
Total	24186.00	90			
Corrected Total	4277.95	89			

*p<0.05 (Significant result)

4.4 Hypothesis 3: There is no significant effects of authentic-based multimedia learning environment on student's behavioral engagement level.

In order to test the hypothesis, Table 4.4 is produced to show the effect of authentic based multimedia learning environment on students' behavioral engagement level. The result in Table 4.4 shows that ($F_{2, 86}$ = 118.004, p = 0.000 < 0.05). Since the P-value is less than 0.05, the hypothesis is thus rejected. This implies that, there is significant effects of authentic-based multimedia learning environment on student's behavioral engagement level.

Table 4.4: ANCOVA showing Effects of Authentic-Based Multimedia Learning Environment on Student's Behavioral Engagement Level

Source	SS	df	MS	F	P
Corrected Model	9985.918	3	3328.639	82.101	.000
Covariate (Pretest)	895.417	1	895.417	22.086	.000
Group	9568.477	2	4784.239	118.004	.000
Error	12325.079	86	40.543		
Total	673947.000	90			
Corrected Total	22310.997	89			

*p<0.05 (Significant result)

The discussion of findings is considered under the research question and hypothesis tested. Thus, the result of the study showed that authentic-based learning environment has a significant influence on the students thinking level by engaging them to the real-world problems. The findings are in support of previous research carried out on the principles of authentic learning environment by J Herrington et al. (2010); Lave and Wenger (1991) that aid

learning success of students engagement in the multimedia learning environment. In line with the findings of this study, Manda (2014) addressed that teachers ' lack of effective subject matter knowledge and classroom implementing strategies as having contributed to low success rates among students and lack of the subject-matter-content that affect knowledge of teachers in the teaching and learning environment negatively. This thereby, stipulates that instructor can influence the students' engagement with the use of innovative teaching instruction in an authentic-based learning environment for the students to achieve the best in their academic pursuit.

5   Conclusion

Despite the extensive usage of multimedia technologies by students and its increase use by instructors, little is known concerning the influence of these multimedia technologies on student engagement in the learning environment. As a result, the aim of the study is to conduct a literature review to see if incorporating multimedia in an authentic-based learning environment for instructional purposes has an influence on students' success in tertiary institutions. Regarding the review's limitations, we conclude that the findings are however relevant and the study attempted to examine the effect of authentic-based multimedia learning environment on the success of student's engagement. The statistical significance of the findings suggests that multimedia has the ability to engage students in an authentic-based learning environment. Therefore, the findings could offer instructors and researchers some informed ideas for using the authentic-based multimedia learning environment to achieve specific learning objectives. From our literature study, we discovered that the learning environment in which students study also influences how deeply they engage with learning. Darling-Hammond et al. (2020) believed that low quality in the incorporation of learning strategy to engage students in the learning contents, such that if the instructors are inexperienced with the technological gadgets, they are less likely to engage it with the students. Thus, the recommendation for future study is to develop a dynamic and engaging learning environment, and instructors should be taught on how to use the resources available to them effectively. In addition, in the classroom using current technology such as computers, web-based applications can assist in engaging student learning in a creative approach.

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