Indonesian Journal of Multidisciplinary Research

Undergraduate Awareness and Utilization of Simulation for Learning

Aderonke Kofo Soetan, Amos Ochayi Onojah*, Benson Oluwatimilehin Nelson

University of ilorin, Nigeria
*Correspondence: E-mail: haymoresonojah@gmail.com

A B S T R A C T S

This study investigated undergraduate awareness and utilization of simulation for learning at the University of Ilorin. This study adopted descriptive research of the survey. 4 research questions were developed and answered. The target population for the study was 239 undergraduate students of the University of Ilorin, which were randomly selected. The findings of the study were (i) undergraduates are aware of the utilization of simulation for learning at the University of Ilorin; (ii) simulation is often utilized for learning amongst undergraduates of the University of Ilorin; (iii) gender differences do exist between a male and female student on the utilization of simulation in among undergraduate of the University of Ilorin; and (iv) area of specialization does not influence the utilization of simulation for learning amongst the university of Ilorin undergraduate. The utilization of simulation for learning has enhanced various students learning capabilities, this has also increased interest amongst students in instructional content. This implies that simulation when properly utilized for learning can positively impact the performance of students. Therefore, efforts should be made to ensure availability and proper awareness of the utilization of simulation systems in various fields of study.

A R T I C L E I N F O

1. INTRODUCTION

Education is regarded as the socially organized and regulated process of continuous transference of significant experience from previous to following generations. The term education is gotten from the Latin word "Educare" (Educere), which means to bring up. Therefore, education is a continuous process of transferring knowledge from the known to the unknown (Bradley, 2012). Education refers to a process of acquiring knowledge that brings to the development of an individual mentally and psychologically. Education as the process of developing individual behavioral skills in other to fit appropriately into society. Education is thus regarded as the process of preparing an individual for his or her societal responsibilities.

The impact of education on societal development can be greatly influenced by the level of technology adopted for educational purposes in the said society. Technology-enabled learning gives learners access to resources and expertise anywhere in the world, starting with their community. The influence of education can be regarded as the backbone of a nation's development, in terms of training, research and development. Therefore, Education is not only limited to environmental influence, but is also regarded as a global determinant of economic growth. Instructional resources are tools that can be used by the teacher to provide help and encourage students learning activities (Soetan *et al.*, 2021).

Education has been improved with the adoption of various technological tools ranging from mobile devices, laptop computers, digital interactive whiteboards, ultra-high-definition television, smart boards, and digital projector to augmented reality, 3d printing, and simulation. These devices and technological tools aforementioned, when utilized appropriately improve learning. But the adoption of these devices requires proper evaluation and principled implementation, which will enable the utilization of the right technological tools in the right appropriate. The simulation requires understanding the dynamic requirement of a system coined through proper evaluation of the system in context. Emphasized the concept of proper experimentation and precise evaluation of the subjected system by simulation analysts, to give a proper understanding of its functionality before recreating an operational simulated system to achieve learning objectives.

The integration of technology into education can be dated back to the utilization of simulation in the aviation sector. The use of aviation simulators has long been used for testing and training young pilots in basic psychomotor tasks that involve the operation of an aircraft, preventive measures, and predictable outcomes that need to be considered in course of the flight. Noted that there has been a prevalent use of simulation in the medical sector. Simulated systems are used to train young doctors and nurses, as the system is designed to provide the young doctors the opportunity to develop cognitive and psychomotor skills, without putting a patient life at stake.

Simulation as a learning resource is a form of student-centered learning approach in which students interact with a system replicated from a real-world scenario or process. The use of simulation as a source of digital entertainment emerged as video and computer games were developed for the benefit of recreational pleasure. Games such as flight simulators, sports simulators, action games, and other simple to complex game designs were commercialized. The development of computer games and simulation led to the incorporation of simulation into education and learning as educationists developed strategies to adopt simulation into learning to achieve learning objectives, it has to be understood that visual explanation of concepts makes learning fun and enjoyable for students. Students can participate more in the

classroom and even teachers get a chance to make their classes more interactive and interesting (Raja & Nagasubramani, 2018).

The impending development of simulation has caused learning to be not only limited to the pragmatic aspect of learning but elicit deeper and better retention of student understanding of the concept, mastery of skill or strategy, and acquisition of knowledge. Simulated learning is an expedient technique that increases the in-depth of students' ideas on concepts taught within the four walls of the classroom, Students are involved actively in a scenario that requires urgency and instantaneous decision-making to measure and analyze data to solve a challenging problem. Examples include "RoomQuake", an entire classroom becomes a scaled-down simulation of an earthquake.

The usage of simulation based on the area of specialization is hinged back on participation in the simulation process is often limited due to a lack of know-how. According to Ronnie and David (2008), due to less apprehension of the simulation process, students lack interest in its use. The technological appliances and techniques utilized are in no good condition to carry out such a process, the complexity of these challenges discourages lectures and leads to the discontinuity of the utilization of simulated models.

Gender is a social, rather than a biological construct, and varies with the roles, norms, and values of a given society or era (Susan, 2005). According to Saida and Mustapha (2018), Gender is said to have a major impact on students learning, as this factor. The effect of gender on the use of simulation can be traced to Susan (2015) research, this research coined that male student tends to have more interest in the simulation process than female, and this research also coined that female student participate less in the learning process. This may limit the simulation process as an effective learning technique among students in general.

Gender is an influential factor in the utilization of simulation. Student participation varies based on the level of personal interest. According to Susan (2015), women participate less often compared to men, concerning personal activeness. Student learning advancement is majorly determined by the interest in learning which results in cognitive engagement. Furthermore, women enjoyed the simulation less than men but felt less included (Katherine, 2012).

Generally, the use of simulation for learning is faced with challenges that limit its optimum usability. The lack of students' prerequisite knowledge on Simulated learning can dim a great effect on the utilization of simulated systems for such students, therefore student's awareness of the usage of Simulation is limited due to the lack of technical knowledge that is required to perceive and assimilate the simulation system, at times the process of linking previously acquired knowledge to practice can be difficult. The complexity of simulation systems, technical know-how, and purpose of simulation which is a new concept to some students will limit the influence of simulated learning due to their background knowledge of the simulated learning technique.

Furthermore, the utilization of simulation for learning requires high demands on students' metacognitive skills, and in some cases, places students in complex environments. Alecia *et al.,* (2008) posited that students' understanding is constructed based on personal experiences, therefore the effect of simulated learning is based majorly on students' previous knowledge. Undergraduate students who are used to the adoption of traditional classrooms and partial use of social media for learning are not steered towards the usage of simulation, this tends to limit their interest occasionally while utilizing such platforms. The main objective of this study is to investigate the awareness and utilization of simulation for learning among undergraduate students of The University of Ilorin, Ilorin, Kwara State, Nigeria. Specifically, the study:

(i) Examine undergraduate students' awareness of simulation for learning at the University of Ilorin.

(ii) Investigate undergraduate utilization of simulation for learning at the University of Ilorin. The following research questions were raised and answered in this study:

(i) What is the level of awareness of undergraduates of the University of Ilorin towards the utilization of simulation for learning?

(ii) How often does undergraduate utilize simulation for learning?

2. METHODS

This study adopted descriptive research of the survey type using the questionnaire method and correlation design in other to describe the relationship between the variables measured in this study. The population of the study encompassed all undergraduate students. The target population for this study encompasses all undergraduate students of the University of Ilorin, Ilorin, Kwara State, Nigeria. This study adopted a random sampling technique limited to 239 students from various faculty at the University of Ilorin to serve as respondents. The instrument employed for this study included a research-designed questionnaire which was administered via google forms. Data collection was done using the designed form to gather information about the study; Undergraduate Awareness and Utilization of Simulation for Learning at the University of Ilorin. The form is designed simply for easy readability to allow students to provide relevant answers to the questions based on personal perception.

The researchers administered the instrument via social media to various departmental groups. The duration of administration of the form was within two weeks. The questionnaire engaged for this study for data collection was approbated by the researchers' supervisor and was validated by three lectures in the Department of Educational Technology, The University of Ilorin. The validity was done to ascertain the appropriateness of the research instrument and also to measure the phenomenon under consideration for which the study was meant to assess after which the corrections made will be used to improve the quality of the instrument.

The questionnaire contains three sections (A, B, and C). Section A centered on the demographic data such as respondents' Faculty, Department, Gender, Age, and current level. Section B consists of content that focuses on Undergraduate Student Awareness of Simulation for Learning in the selected university. Section C consists of content that focuses on the Undergraduate Utilization of simulation for learning in the selected university. Research question one was a close-ended one which restricts the respondents to respond on a four-point Likert scale which ranges from Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) to determine Undergraduate Student Awareness of Simulation for Learning in the selected institution.

3. RESULTS AND DISCUSSION

Table 1 indicated the distribution of undergraduates according to Gender. The table revealed that the total number of undergraduates is 239. The majority of the undergraduates are male recording 59.8% against the female undergraduates 40.2% that served as respondents for this study.

Table 2 indicates the distribution of the correspondents according to Area of Specialization. The total amount of faculties that took part in this research is summed to be 10, these are; Agriculture which has a total of 24(10%) correspondents, Art which has a total of 24(10%) correspondents, Communication Science which has a total of 24(10%) correspondents, Education which has 60 respondent which has the highest percentage

(25.4%) of respondents, Engineering has a total of 12 (5%) correspondent, Life Science has a total of 24 (10%) correspondents, Management has a total of 12(5%) correspondents, Physical science has a total of 23 (9.6%) correspondent, Social science has 12 (5%) correspondent, Veterinary medicine has a total 24 (10%) correspondent.

Table 1. Distribution of undergraduates by gender.

Gender	Frequency	Percentage (%)
Male	143	59.8
Female	96	40.2
Total	**239**	**100**

Table 2. Distribution of undergraduates by faculty.

Area of Specialization	Frequency	Percentage (%)
Agriculture	24	10.0
Art	24	10.0
Communication Science	24	10.0
Education	60	25.4
Engineering	12	5.0
Life Science	24	10.0
Management	12	5.0
Physical Science	23	9.6
Social Science	12	5.0
Veterinary Medicine	24	10.0
Total	**239**	**100**

3.1. Research Question One: What is the level of awareness of undergraduates of the University of Ilorin towards the utilization of simulation for learning?

In determining an Undergraduate's level of awareness of simulation for learning, a scale of percentage decision rating was adopted. Data collected were analyzed using frequency count and percentage.

As indicated in **Table 3**, 80% of undergraduates claimed that they are familiar with simulation as a learning concept, while 20% disagree with the claim that they are familiar with simulation as a learning concept. According to **Table 3**, all undergraduates agreed to the fact that simulation has a positive impact when used for learning. The table also illustrated that 84.9% of undergraduates agreed that the impact of simulation on learning is limited to the level of students' awareness of learning content.

Table 3. Level of Undergraduate Awareness of Simulation**.**

S/N	ITEMS	Strongly agree F (%)	Agree F (%)	Disagree F (%)	Strongly disagree F (%)
1.	I am familiar with simulation as a learning concept.	143 (59.8)	48 (20.2)	24 (10.0)	24 (10.0)
2.	The use of simulation for learning provides students with the necessary information and cognitive skills.	95 (39.8)	144 (60.2)		
3.	The use of simulation improves rather than degrades learning.	155 (64.9)	84 (35.1)		
4.	Simulation's impact on learning is limited by the student's awareness of instructional content	83 (34.7)	120 (50.2)	36 (15.1)	
5.	Simulation can be beneficial when used for learning, work, and other leisure activities.	119 (49.8)	72 (30.1)	48 20.1)	

3.2. Research Question Two: How often does undergraduate utilize simulation for learning?

Research Question 2 is answered as shown in **Table 4**. The level of Utilization of simulation for learning as illustrated in the above table, a scale of percentage decision rating was adopted. Analysis was done using frequency count and percentage.

Table 4. Level of Undergraduate Utilization of Simulation.

S/N	ITEMS	Strongly agree F (%)	Agree F (%)	Disagree F (%)	Strongly disagree F (%)
1.	I have previous knowledge of simulation.	131 (54.8)	108 (45.2)		
2.	The use of Simulation for learning stimulates my interest to learn.	95 (39.7)	84 (35.1)	60 (25.2)	
3.	I usually perform excellently when introduced to a concept through simulated learning.	107 (44.8)	60 (25.1)	24 (10.0)	48 (20.1)
4.	My interaction with instructional simulation can be handled personally.	131 (54.8)	96 (40.2)		12 (5.0)
5.	Gender differences do not affect simulation use for learning.	95 (39.7)	132 (55.3)		12 (5.0)
6.	Simulation is frequently applied for instructional purposes in my field of study.	119 (49.8)	72 (30.1)	36 (15.1)	12 (5.0)
7.	I understand that simulation can be used for a variety of purposes other than learning.	131 (54.8)	84 (35.2)	12 (5.0)	12 (5.0)
8.	I interact with simulated systems asides from learning i.e., Games, Multimedia, etc.	167 (69.9)	48 (20.1)		24 (10.0)

As indicated in **Table 4**, most undergraduate students agreed that they utilize simulation for learning. 74.8% agreed that the utilization of simulation stimulates their interest to learn, while 25.2% accessed that simulation does not stimulate their interest to learn. As analyzed and stated

in the table, a majority (90%) of the respondent agreed that simulation is used for another purpose other than learning, while a minority (10%) disagreed with the statement. The majority (90%) of the respondent also agreed that simulation is utilized for other activities other than instructional purposes, while 10% of the respondent opposed the statement.

4. CONCLUSION

The utilization of simulation for learning has enhanced the learning capabilities of various individuals and made instructional content simplified to seek students' various learning styles, this has also increased student engagement with instructional content as instructional activities require students' real-time response. Hence, this implies that simulation, when applied to learning, can positively impact the performance of students but the effort should be made to ensure proper awareness of the utilization of simulation systems in various fields of study. Based on the findings and conclusions of this study, the following recommendations were made: (i)Efforts should be made by students to focus the utilization of simulated systems on instructional purposes to enhance rather than degrade students learning; (ii) Institutions of learning should checkmate the purpose of usage of simulated systems among their learners. This should be aligned with achieving institutional goals; (iii) The use of simulation should be further encouraged amongst students. This will provide an avenue for learners to accept, adapt and learn on a personalized, individualized, self-paced level, and in an uninterrupted manner which will, in turn, translate to better academic performance.

5. ACKNOWLEDGMENT

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

7. REFERENCES

Alecia, D., Francis, K., and C., P. (2008). Students' perceptions of the usefulness of a virtual simulation in post-secondary hospitality education. *Journal of Teaching in Travel and Tourism, 7*(3), 1-19.

Bradley, A. (2012). Improving teaching through continuous learning. *The Inquiry Process John Wooden Used to Become Coach of the Century, 63*(3), 197-208.

Katherine, W. (2012). Gender differences in interest, perceived personal capacity, and participation in STEM-related activities. *Journal of Technology Education, 24*(1), 18-33.

Raja, R., and Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research, 3*(1), 33-35.

Ronnie, J. G., and David, M. G. (2008). Challenges and opportunities in simulation and assessment. *Journal of the Society for Simulation in Healthcare, 3*(2), 69–71.

Saida, H., and Mustapha, F. (2018). The effect of gender on university students' school performance: the case of the national school of agriculture in meknes, Morocco. *The Case of the National School of Agriculture in Meknes, Morocco, 9*(1), 67-78.

Soetan, A. K., Olanrewaju, O. O., Onojah A. O., Abdulrahman, M. R., and Onojah, A. A. (2021). Assessment of instructional resources for teaching agricultural science in secondary schools in Oyo State. *Online Journal of Distance Education and e-Learning (TOJDEL), 9*(3), 362-371.

Susan, P. P. (2005). Defining and measuring gender: A social determinant of health whose time has come. *International Journal for Equity in Health, 4*(11), 1-4.