



Web-based instruction and students' motivation and engagement in computer education in faculty of education, university of Port Harcourt

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Abstract

The study investigated web-based instruction as an innovative approach in teaching Computer Education in faculty of Education, university of Port Harcourt using the World Wide Web. In order to ascertain Students Motivation and Engagement using web-based instruction, the study employed a quasi-experimental design using pre-test and post-test for students' motivation and Engagement. The population of the study was the entire final year students taking Computer Education course in Faculty of education which is about 1,113 students. Purposive sampling technique was used to select the department used to carry out the study using intact class of 95 students as the sample size. The instruments for the study were motivation scale questionnaire and engagement rating scale. The instruments were validated by my supervisors and other experts in the field. The reliability of the instruments was done using Cronbach alpha which had a coefficient of 0.73 and 0.76. The data was analyzed using mean and standard deviation for the research questions, a range mean of 2.50 was used as the interpretative norm that determined its level of acceptance or rejection. On the other hand, the hypotheses Postulated were analyzed using t-test at a 0.05 significant level. Analyses of data revealed that web-based instruction has positive impact on students' motivation and engagement. Based on the findings, recommendations were made among others: teachers should balance their lesson to be more of asynchronous to increase students' motivation. Also develop course content following the ASSURE model and Richard Mayer's multimedia principle when designing the web instruction to enhance students engagement.

Keywords: Web-Based instruction (WBI), Technology, Motivation, Engagement

Introduction

Using Web-based instruction as a flexible learning medium that can enhance learning processes and offer the ability to satisfy the demands of 21st-century students in diverse locations is one technique to boost learning flexibility. The argument that education should move in the direction of the learners rather than the other way around is advanced by Ray (2012) ^[24] who claims that web-based instruction can satisfy the stated demand for flexibility in terms of pace, place, and face. Individually, students favour online education over traditional instruction, which some academics have previously classified as "teacher-centered" (Abedi, Keshmirshakan, & Namaziandost, 2019; Zhang X. et al, 2019; Ding & Zhang, 2018) ^[1]. It is clear that those involved in the educational system are embracing web-based instruction more and more because of its adaptability and flexibility. When participating in a virtual classroom, students could feel a feeling of camaraderie. Students' interest in learning and appreciation of intellectual exchange both rise as a result of web-based learning. On the other hand, because of its adaptability and interactivity, web-based teaching does meet up to students' expectations in the twenty-first century. The expectations that students have on a personal level demands that vary depending on the application were not taken into account when traditional learning approaches were designed. The same cause causes the same effect, according to Bozkurt (2018) ^[5], who claims that traditional educational institutions typically adopt this notion of causality.

Student demand for web-based learning quickly rose as more benefits were revealed. Web-based instruction gives students access to a variety of academic possibilities. Interactions, relationships, performances, and success serve as examples of this. Students' communication skills, as well as their engagement, participation, and involvement in a variety of educational activities, gain from web-based instruction (Serdyukov & Serdyukova, 2012). In conclusion, the availability of information technology resources as well as institutional and governmental commitment to interactive and successful education in the twenty-first century is fueling the development of web-based instruction approaches. Both developed and developing nations are experiencing this development.

Web-based instruction is an innovative approach for delivering instruction to a remote audience, using the World Wide Web as the instructional delivery medium (Khan, 1997)^[18]. Web-based instruction is available to the entire organization at any time and from any location. Trainees can access the course materials whenever they want, whether they are at home, at work, or even on the go through a learning management system. They can also communicate with one another in both large and small groups using electronic communication tools like discussion lists and e-mail. Khan (2001)^[14] described eight dimensional Frameworks for web based instruction. These dimensions are pedagogical, technological, Evaluation, Management, Resource support, interface design, institutional and Ethical.

In other to achieve this innovative approach, the researcher will adopt a model like ASSURE Model to develop course content on computer in education course, following Mayer's Multimedia principle to design an instructional video for the learners, that ill Engage and motivate them thereby increasing their performance. This study will focus on Computer Education students in Faculty of Education, University of Port Harcourt.

Statement of problem

According to Marc Prensky (2001)^[23] a person who has grown up in this information Era is called "Digital natives." These individuals are more receptive to participating in online education and training activities. Web-based instruction, in the opinion of Ray (2012)^[24], can ostensibly meet the demand for flexibility in terms of pace, place, and face. According to Zhang et al. (2018), students prefer web-based learning courses to traditional learning techniques. However, this innovative approach of instruction differs from conventional methods in the way it is put together. Technology has made it possible for individuals to learn at their own pace, irrespective of their locations and schedules because of web. As we all know, learning is no longer limited to the four walls of a school. Web Based Instruction can either be synchronous or Asynchronous but for this study, the researcher will focus on the Asynchronous aspect of web Based, where Learning can occur at different time depending on the learners schedule and pace. The problem with this type of learning lies in the designing of the instructional package, it has to be systematically designed following a model like ASSURE Model and also Richard Mayer's principle of multimedia in other to motivate, engage and increase learners' performance.

Aim and Objectives of the Study

The aim of this study is to investigate the motivation and

engagement level of Computer Education students in web-based instruction.

In this research study the objectives are as follows

1. To determine the Motivation level of students using web based instruction
2. To ascertain the Engagement level of students using web based instruction

Research Questions

The Research questions for this study are as follows

1. Is there any effect of web-based instruction on students' Motivation in Computer Education?
2. What is the effect of web-based instruction on students' Engagement in Computer Education?

Hypotheses

The Hypotheses for this study are as follows:

1. Web based instruction does not significantly affect students Motivation in Computer Education
2. Web based instruction does not significantly affect students' Engagement in Computer Education.

Related Literature Review

Concept of Motivation

According to Artino (2016), motivation is the propensity for a person to attain their goals in line with a predetermined set of norms. It also refers to the internal and external factor that drives a person to learn. Motivation can be intrinsic or extrinsic. Academic motivation, which is at the uncontrolled end of the motivation spectrum, is characterized by a person's sense of helplessness, inadequacy, and lack of direction. According to Artino (2016), the action that initiates and sustains goal-directed activity is motivation. It was also emphasized how crucial it is for students' learning objectives, values, and sense of self-efficacy to affect how they build and alter their conceptions. In other words, students who are driven to work hard and interested in changing their mental understanding would select gait competency as their learning objective. This is because they are confident in their abilities. The conceptual change initiatives are worthwhile Academic qualifications, professional standards, and student teaching techniques, learning environment and each student's particular learning goals are significant elements that boost students' academic motivation.

Concept of Engagement

According to Fedricks et al. (2004), the general consensus is that students are enthusiastic and invested in their own learning. However, definitions can differ and even conflict with one another. As a result, Engagement isn't defined in a way that is universally agreed upon, and various people may have different opinions about what engagement includes. One of the more thorough definitions breaks engagement down into conduct, emotion, and cognitive components. This might make judging engagement simpler, especially when looking for indications of involvement.

Engagement Theory

The engagement theory idea was first presented by Greg Kearsley and Ben Shneiderman in 1999^[16]. However, according to them, "technology can facilitate engagement in ways which are difficult to achieve otherwise" (Kearsley & Shneiderman 1999)^[16]. According to this theory,

constructivist and problem-based learning approaches in particular share many traits with engagement theory and other theoretical frameworks for learning. The engagement theory claims that students learn best when they are actively involved in tasks that "involve cognitive processes such as creating, problem-solving, reasoning, decision-making, and evaluation" and are "motivated to learn due to the meaningful nature of the learning environment and activities" (Kearsley & Shneiderman, 1999) [16].

Engaging online learners: The Effect of Web-Based Instruction Technology on College Student Engagement

Chen and Dumford conducted the 2010 study *Engaging Online Learners: The Impact of Web-based Instruction Technology on College Student Engagement*. The use of the Web and other Internet technologies in postsecondary education has grown significantly during the past 15 years. In order to examine the effects of Web-based learning technologies on student engagement and self-reported learning outcomes in face-to-face and online learning environments, the researchers employed a series of questions developed by the National Survey of Student Engagement (NSSE). Multiple regressions and the hierarchical linear model (HLM) were employed. The results show a typically favorable association between student engagement, learning outcomes, and the use of instructional technology. We also discuss the possible effects it may have on minority and part-time students because they are more prone to engage in online courses. This study support the present study because they both investigate the effect of web based instruction on students' engagement, however, they differ in the tool used in measuring the engagement level as the present study used engagement rating scale in measuring students' engagement. Computer-based technology and student participation was the subject of research by Schindler, Burkholder, Morad & Marsh (2017). This study was a critical examination of literature that has permeated many spheres of life and industry but has received little attention in higher education, despite its relationship to a variety of positive academic results. Its use to increase student engagement has not been fully examined. The purpose of this article is to offer a critical assessment of research from the previous five years on how online games, blogs, wikis, and social media sites like Facebook and Twitter affect student involvement. We provided a full explanation of the ideas and criteria for student involvement prior to presenting the data, which demonstrated that engagement can take three various, forms (behavioral, emotional, and cognitive). These responsibilities served as the cornerstone for our categorization of articles. According to our research, Facebook and online conferencing rank second and third, respectively, in terms of the impact they have on various forms of student communication. Wikis, blogs, and Twitter have received less research in the last five years; therefore, conclusions concerning them are less clear. Overall, the findings provide some preliminary evidence in favor of the concept that computer-based technology affects student engagement, but further research is needed to confirm and build on these findings. We present a list of practicing suggestions at the end of the paper to help readers' better grasp how computer-based technology may be strategically employed to obtain the maximum gains in student engagement. This study aligns with the present study in the sense that they both investigate the effect of web based instruction on students' engagement.

2019 saw the completion of a study by Chiang, Hii, Ong, Lim, Tiong, & Nurzulaikha with the goal of boosting classroom engagement through the use of web-based interactive technologies. Students from Generation Z have grown up with technology in their daily lives, thus it is becoming more common in learning environments. Online surveys for the study were completed by undergraduates from the Chemical and Environmental Engineering Department and foundational engineering students. It investigated the value of web-based interactive technologies (WIT) as seen by University of Nottingham Malaysia (UNM) students. Key findings show that the WIT tools were successful in sustaining students' interests and encouraging participation in the learning process. The importance of leveraging WIT technologies to raise the standard of student learning in the classroom and promote student participation was also highlighted in this study. The study aligns with the present study because they both investigate the effect of web based instruction of students' engagements but differs from the present study in the tool used in measuring engagements as well as the study area.

Research Methodology

This study used a quasi-experimental design with pretest and posttests for its two groups, one receiving standard teaching as the control group and the other receiving web-based instruction. According to Nwankwo (2007), a quasi-experimental study is one in which some threats to validity cannot be adequately managed due to circumstances linked with the study that cannot be avoided. The researcher designed an instructional package using the ASSURE Model and Richard Mayer principle of multimedia which was only tested on the experimental group. The population of this study consisted of 1,113 students' in the Faculty of Education taking computer education course. Purposive sampling technique was used to select the department to be used in carrying out the study. 95 students of intact class served as the sample size. The instruments used were motivation scale questionnaire and engagement rating scale which was validated by experts in the field of measurement and evaluation. Cronbach alpha was used to obtain a reliability coefficient of 0.73 and 0.76. Pre-test and post test was administered to the control and treatment group to ascertain the motivation and engagement of students. The post test was administered after a period of two weeks and analyzed. Research questions were analyzed using mean and Standard deviation. Hypotheses were tested using t-test at 0.05 significant level.

Analysis and Interpretation

Research question 1: Is there any effect of web based instruction on student's motivation in Computer Education?

Table 1: Mean & standard deviation analysis of effect of web based instruction on student's motivation in Computer Education

Motivation	N	Mean	Std. D	Std. Error
Pre-Motivation	34	27.20	3.88	.6659
Post-Motivation	34	30.20	5.92	1.016

Table 1. Displays how web-based instruction affects students' motivation. The pre-motivation group consisted of 34 individuals and had a mean score of 27.20 and a standard deviation of 3.88. According to their responses, which were

closely clustered around the mean score, the students exhibited a small degree of desire before the implementation of web-based instruction, which is what this shows. The post-motivation group, which also included 34 participants, had a mean score of 30.20 and a standard deviation of 5.92. This demonstrates that the usage of web-based instruction increased the students' motivation, as indicated by the responses being more uniformly distributed than those from the pre-motivation group. The rise in the mean score from the

pre-motivation group to the post-motivation group suggests that web-based instruction increased students' motivation in computer Education. Overall, the study's findings show that web-based instruction had positive effect on students' motivation in computer education.

Hypothesis 1: Web-based instruction does not significantly affect student's Motivation in Computer Education.

Table 2: Dependent samples t-test analysis of Web-based instruction of significant effect on student's motivation in Computer Education

Motivation	N	\bar{x}	SD	Df	T	Sig.	P	Decision
Pre & Post Motivation	34	3.00	.405	33	2.362	.000	0.024	Reject Ho1 P<0.05

Table 4.4 shows that $t(33) = 2.362$ $p > 0.5$, or $p = .024$ is less than 0.05, is statistically significant at the chosen alpha level of 0.05. Web-based instruction therefore significantly affects students' motivation in Computer Education. There is a sizable distinction between pre- and post-mean motivation. The alternative is accepted, and the null hypothesis that there is no significant difference in students' Motivation in computer Education using web based is rejected.

Research question 2: What is the effect of web based instruction on student's Engagement in Computer Education?

Table 3: Mean & standard deviation analysis of effect of web based instruction on student's Engagement in Computer Education

Engagement	N	Mean	Std. D	Std. Error
Pre-Engagement	34	34.83	4.83	.8297
Post-Engagement	34	36.61	3.42	.5880

Table 2 presents the results of the effect of web-based instruction on students' engagement in computer education. The study involved an experimental group that received web-based instruction, and data was collected on their engagement level before and after the instruction was given. The table provides information on the mean and standard

deviation of pre-engagement and post-engagement scores for the experimental group, as well as the standard error. The pre-engagement mean and standard deviation values represent the level of engagement of the participants before the instruction was given, while the post-engagement mean and standard deviation values show the level of engagement after the instruction.

Looking at the results, it is observed that the pre-engagement mean score for the treatment group was 34.83, with a standard deviation of 4.83. This indicates that the initial level of engagement among the participants in the experimental group was moderate, with some variability in the scores within the group. After the web-based instruction was given, the post-engagement mean score increased to 36.61, with a standard deviation of 3.42. This represents an improvement in engagement level, which is also reflected in the difference in the means.

Based on these results, it can be concluded that the web-based instruction had a positive effect on students' Engagement in computer education.

Hypothesis 2: Web-based instruction does not significantly affect student's Engagement in Computer Education.

Table 4: Dependent samples t-test analysis of Web-based instruction of significant effect on student's Engagement in Computer Education

Engagement	N	\bar{x}	SD	Df	T	Sig.	P	Decision
Pre & Post Engage	34	4.05	.910	33	4.458	.000	0.05	Reject Ho1 P<0.05

The table 2, shows that $t(33) = 4.458$ $p < 0.5$, i.e. $p = .000$ is less than 0.05 and this is statistically significant at the chosen alpha level of 0.05. Therefore, there is a significant effect of web based instruction on student's engagement in Computer Education. The difference that exists between the pre mean and post mean engagement is significant. The null hypothesis of web based instruction not significantly affecting the engagement of student in Computer Education is rejected and the alternate is accepted.

Conclusion

Based on the findings in this study, web based instruction has an effect on students' motivation and engagement. This can be as a result of the asynchronous approach deployed and also the Richard Mayer principle used in designing the course content.

Recommendations

This study on the impact of web-based instruction on students' motivation and engagement in computer Education

has shown that web-based instruction is, in fact, a cutting-edge technique of instruction that will improve students' engagement. The suggestions are as follows:

1. Asynchronous methods of instruction delivery, which provide students the opportunity to learn at their own pace and convenience, should be given more attention by teachers.
2. Course designers should focus more on producing rich and captivating content to maintain online learners' interest.
3. When building courses for learners, course designers should work hand in hand with subject matter experts.
4. Teachers should encourage students to use application software like Google Classroom, Whatsapp, etc. for constant communication and instruction.
5. Instructors should provide students projects that will necessitate frequent internet use for independent research.
6. Teachers should assign students tasks and objectives that will enable them to study on their own time and at their

own pace.

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