Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8
Open Access

A Research To Analyze Student Educational Assessment Using Virtual Reality Technologies

Qiu Jun 1st , Muhantha Paramalingam 2nd

Cite this paper as: Qiu Jun, Muhantha Paramalingam (2024) A Research To Analyze Student Educational Assessment Using Virtual Reality Technologies". *Frontiers in Health Informatics,* (8), 5382-5390

ABSTRACT

The overarching objective of this study is to synthesize existing studies on the topic of student internet usage and its effect on academic achievement. The primary goal of this research was to identify the elements that influence children's online behavior. Additionally, this study aims to assess the breadth of students' online activity and the variety of ways they use the internet. A number of academic articles were combed through by the investigator. The online actions of students are crucial to each of the aspects that have been studied. In nine of the research, the frequency of students' internet usage was examined, whereas fourteen studies examined the means by which students gained access to the internet. Only publications addressing matters directly relevant to universities were taken into consideration for inclusion. Thanks to online resources, students may now easily access academic publications and articles that were previously unavailable via traditional library methods. Students' scholastic success improved significantly when their internet use increased. Children who spend too much time on social media may struggle to concentrate on their studies, according to research. Consequently, it was suggested that the school's leadership implement specific rules to assist pupils in managing the difficulties they have while engaging with data found online.

Keywords*:* *Internet, Impact, Learners, Digital Technologies, Academic Outcomes, Beneficial Factors, Detrimental Aspects, Social Networking and Education, Educational Assessment.*

1. INTRODUCTION

According to (Natale et al., 2020), this research aims to provide evidence of the many VR uses in the realm of education. It aids in understanding the current level of practice and the state of the art by providing examples of systems that are both employed in real-world applications and those that are still being studied and developed. In order to determine what could be taught, how major obstacles were addressed, and if the technology was beginning to reach its full potential, this study also looks at how professors and instructors rated VR educational applications. Many researchers and teachers believe that virtual reality (VR) technology may greatly boost classroom instruction. The central question for some was whether or not VR can support constructivist pedagogical approaches. There was some discussion of possible other methods of teaching that may work for various kinds of students, including those who learn best visually. Some have argued that the greatest advantage was the opportunity for teachers and students to work together in a virtual classroom regardless of their geographical locations. Students were often taught via assimilation in conventional classrooms. As an example, listening to a teacher or instructor talk about a topic could be a great way for pupils to

learn about it. New information is better acquired, retained, and used when students actively engage in its production in a learning-by-doing environment, according to the prevalent educational paradigm. There was a school of thought within pedagogy known as constructivism, and its followers had different opinions on how to implement it in the classroom. There are those who think it may be a good supplement to the traditional telling-based method of instruction, and some who think kids should be allowed to reevaluate the whole curriculum via the use of gently guided exploratory learning (Mäkinen et al., 2022).

2. BACKGROUND OF THE STUDY

Nyakwende claims that as a direct consequence of globalization, there is a mixed bag of benefits and drawbacks for college students who use ICTs, such as the internet. Doing a quick Google search might help students finish their assignments and find solutions to any challenges they may be experiencing with their coursework. Despite their physical separation, they maintained open lines of communication and shared ideas and information. Modern technology has made this a reality. A major player in the information and communication technology that caused a dramatic change in the structure of the world's information landscape was the Internet. The proliferation of the internet was the driving force behind this change. Students were able to get new insights into a subject by exchanging stories about their own learning experiences within the context of problem-solving strategies. Students are given the chance to learn about other perspectives in this way. Hello Mr. Siraj. Hsieh claims that students' increased happiness while in class is mostly attributable to the moderating effect of online education. According to Akin Ademola, the original intent of the internet was to make it easier for individuals of all ages to take part in all kinds of social events. The ability to do this was a primary motivation for creating the internet. The proliferation of the internet and related technologies has had a profound impact on every facet of people's lives. Educational institutions began using the internet as a tool to enhance students' learning experience during the middle of the 1990s, according to Ngoumandjoka's research. Many individuals rely on the internet for many purposes, and each of those uses need a unique kind of support (Lorenzo et al., 2019).

3. PURPOSE OF THE RESEARCH

Virtual reality (VR) technology has changed the way schools evaluate their pupils' progress, and Students research team set out to find out. The primary goal of this study was to identify any ways in which VR may improve the usability, relevance, and reliability of student evaluations across a range of educational contexts. This study sets out to answer the question, "How can virtual reality (VR) be integrated into assessment methods to enhance educational productivity, student motivation, and learning outcomes in different classroom contexts?" by investigating various VR applications in the lecture hall.

4. LITERATURE REVIEW

The majority of students' experiences with virtual reality (VR) in the classroom have been using pre-existing VR software. For instance, with the aid of these applications, students may study various historical periods or get an understanding of fundamental ideas by independently exploring a virtual environment. Conversely, teachers may let their students show off their expertise in both STEM and non-technical areas by having them create their own virtual environments. This may be a great tool to help kids with their studies, comprehension, and presenting skills. The data visualization exercise of comparing the proportions of pre-developed, student-developed, and multiuser VR was intriguing. The ratio was around 13:7:1, with 40 applications under development, 21 student-development initiatives, and 3 multiuser apps. Presumably, most virtual reality apps are already made, which is understandable given that they serve as entry points for both students and teachers to familiarize themselves with the technology and to ask fundamental concerns about its potential educational uses. Research is at the heart of most of the activities that fall under this category. It may come as a surprise that students are engaged in the creation of virtual worlds in so many endeavors, considering the level of technical expertise required and the facts mentioned above. The great majority of these sorts of endeavors are really carried out by only two organizations. The combined efforts of these two categories explained around two-thirds of the instances. Overall, virtual reality technology is still in its infancy, and this is seen in the limited number of uses for multiuser, distributed VR. Studies on how virtual reality, networking, and communications may all operate together were in their infancy. Although there are currently just three works in this category, creators of existing VR apps have expressed their ambition to create networked versions of their programs with numerous users in the future. (Kuleto et al., 2021) noted that this objective was brought up many times over the course of the discussion.

5. RESEARCH QUESTIONS

- What is the impact of workload on educational assessment?

6. RESEARCH METHODOLOGY:

6.1 Research design:

The analysis of quantitative data was conducted using SPSS version 25. The direction and degree of the statistical association were evaluated using the odds ratio and the 95% confidence interval. Researchers identified a statistically significant threshold at $p < 0.05$. A descriptive analysis was used to ascertain the primary features of the data. Data acquired by surveys, polls, and questionnaires, or by modifying existing statistical information using computing tools, is often assessed mathematically, numerically, or statistically through quantitative methods.

6.2 Sampling:

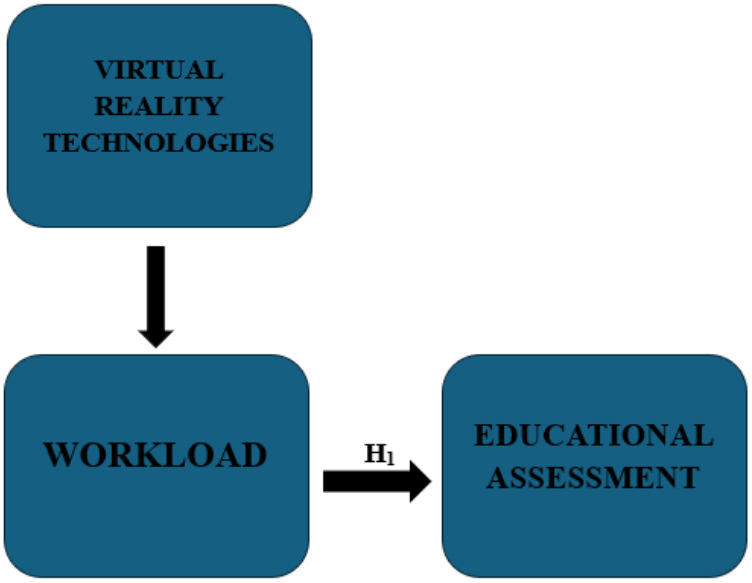
After pilot research with 40 Chinese researchers, 1380 Rao-soft pupils were included in the final researcher. Male and female researchers were picked at random and then given a total of 1,635 surveys to fill out. A total of 1435 questionnaires were used for the calculation after 1500 were received and

65 were rejected due to incompleteness.

6.3 Data and Measurement:
The main tool for data gathering in the study was a questionnaire survey. Part A of the survey requested essential demographic information, while Part B asked respondents to assess various aspects of online and offline channels on a 5-point Likert scale. Secondary data was gathered from many sources, mostly emphasizing online databases.

6.4 Statistical Software: The statistical analysis was conducted using SPSS 25 and MS-Excel.
6.5 Statistical Tools: To grasp the fundamental character of the data, descriptive analysis was used. The researcher is required to analyze the data using ANOVA.

7. CONCEPTUAL FRAMEWORK



8. RESULT

- **Factor Analysis**

A common use of Factor Analysis (FA) is to ascertain the presence of latent variables within observable data. In the absence of readily discernible visual or diagnostic indicators, it is customary to use regression coefficients to provide ratings. In FA, models are crucial for success. The objectives of modelling are to identify errors, detect intrusions, and establish evident correlations. A method to evaluate datasets generated by multiple regression analyses is using the Kaiser-Meyer-Olkin (KMO) Test. They confirm that the model and sample variables are representative. The data exhibits duplication, as shown by the figures. Reduced proportions facilitate comprehension of the data. The output for KMO is a value ranging from zero to one. If the KMO value ranges from 0.8 to 1, the sample size is deemed sufficient. These are the allowable limits, as per Kaiser: The subsequent

approval requirements established by Kaiser are as follows:
A regrettable 0.050 to 0.059, inadequate 0.60 to 0.69
Middle grades often span from 0.70 to 0.79.
Demonstrating a quality point score ranging from 0.80 to 0.89.
They are amazed by the spectrum of 0.90 to 1.00.
Table 1: Examination of Sampling Adequacy using KMO and Bartlett's Test Results from the Kaiser-Meyer-Olkin test: 0.90. This is what Bartlett's sphericity test came up with: At the 0.000 level of significance, the chi-square degrees of freedom are around 190. This proves that claims made for the sake of sampling are genuine. Researchers used Bartlett's Test of Sphericity to determine the significance of the correlation matrices. A Kaiser-Meyer-Olkin rating of 0.980 indicates that the sample is adequate. Bartlett's sphericity test yields a p-value of 0.00. A favorable result from Bartlett's sphericity test indicates that the correlation matrix is not an identity matrix.

Table: KMO and Bartlett's

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.980
Bartlett's Test of Sphericity	**Approx. Chi-Square**	3252.968
	df	190
	Sig.	.000

Using Bartlett's Test of Sphericity further established the general relevance of the correlation matrices. For Kaiser-Meyer-Olkin sampling, an adequate value is 0.980. The researchers obtained a p-value of 0.00 using Bartlett's sphericity test. The correlation matrix was shown to not be a correlation matrix by a significant test result from Bartlett's sphericity test.

- **INDEPENDENT VARIABLE**
- **Virtual Reality Technologies**

Designing a virtual reality (VR) experience revolves on making the user feel as if they are interacting with real-life items and scenes in a computer-generated environment. One may experience this environment with the use of Virtual Reality (VR) headgear. The term "virtual reality" (VR) refers to a technology that allows users to temporarily suspend their sense of perception in favor of an artificially created, three-dimensional (3D) environment. Users may be asked to wear protective gear such as goggles, headphones, or bodysuits in addition to the computer hardware and software that creates the environment. Immersed in a virtual reality (VR) environment, people are more inclined to accept

things at face value, no matter how ridiculous they seem, since they progressively lose track of reality. In order to realize its potential as a medium for the accurate expression of a wide range of emotions, virtual reality still has a ways to go. However, virtual reality has come a long way in providing genuine sensory experiences, and it has great economic promise in several industries. The acronym "VR" refers for "virtual reality," a technology that creates an artificial environment from scratch or one that is purposefully meant to surround the user. Everything is visible all the time, including medical education, video games, and more (Hamilton et al., 2021).

- **FACTOR**
  - **Workload**

The entire amount of work that a machine, employee, or team is capable of or predicted to complete is called their workload. Everyone seems to have their own interpretation of what the word "workload" means. The authors Guillén-Gámez et al. (2022) defined workload as "the perceived relationship between the amount of mental processing capability or resources and the amount required by the task." It could also mean the link between a group or an operator's needs and those of a specific task. Basically, it's the quantity of work that's expected of a person. Achieving a reasonable workload distribution and avoiding overload or underload is the major objective of workload evaluation and forecasting. The quantity of work done in a given time frame (as measured by hours worked or course assignments), the degree of production, or the degree to which the task poses mental or physical challenges (e.g., communicating with someone whose native language is different from the student's own) are just a few ways to put a number on it (González-Zamar et al., 2020).

- **DEPENDENT VARIABLE**
  - **Educational Assessment**

Assessment provides a structured framework for drawing conclusions on pupils' learning and growth (Fragkaki et al., 2020). Information literacy is the process of enhancing students' learning and development via the following steps: defining, choosing, creating, collecting, analyzing, understanding, and applying information. The goal of assessment for learning (AFL) is to help students grow as learners by providing them with constructive criticism on their work. Students develop self-assurance in their ability to learn and the level of difficulty associated with certain topics when they actively participate in class. A common term in educational settings, "assessment" refers to an evaluation of some kind, with one kind of assessment being to gauge students' level of knowledge and understanding. One kind of evaluation tool is the term paper or test.

- **Relationship between Workload and Educational Assessment**

Poor academic performance, inability to absorb and retain information, and lack of motivation to study might be the outcome of excessive stress and effort. Prolonged stress may lead to a variety of mental health issues, including anxiety and depression. Up to a certain degree, the research found that workload directly correlates with increased productivity per employee; beyond that point, the

relationship between effort and performance takes an inverted U-shaped structure. But at that point, it falls significantly. Part and parcel of education is assessment, the goal of which is to collect, organize, and evaluate information about how well pupils have learned and performed. The effectiveness of classroom assessment procedures is directly related to the level of student accomplishment. Time spent studying, grades, questions covered, and extracurricular activities are the most critical factors in determining academic achievement. The purpose of this study is to identify the relative importance of these variables in predicting students' academic performance in the future (Fernández-Arias et al., 2023).

- ***$H0_1$: There is no significant relationship between Workload and Educational assessment.***
- ***H_1: There is a significant relationship between Workload and Educational assessment.***

Table 2: H_1 ANOVA Test

ANOVA					
Sum					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	39588.620	622	5655.517	618.883	.000
Within Groups	492.770	812	5.356		
Total	40081.390	1434			

Important findings will be derived from this research. The p-value of.000 (less than the.05 alpha threshold) approaches significance with an F-value of 618.883. A rejection of the null hypothesis and acceptance of ***"H1: There is a significant relationship between Workload and Educational assessment"*** is accepted, is accepted and the null hypothesis is rejected

9. CONCLUSION:

The purpose of this research was to systematically examine previous studies that examined the correlation between students' internet use and their academic performance. Therefore, students should be responsible for their own internet use and teachers should help students overcome the challenges they face while studying online. According to studies, students' learning results improve when they have access to the internet. On the other hand, there are a number of negative impacts that might lead to a decrease in students' learning outcomes. The widespread and easy availability of technology has led many to see individuals and communities as reliant on it. Considering how ubiquitous online social networks are become, this is particularly the case. Students' capacity to collaborate efficiently and rapidly has been substantially improved by the advent of online networking. Online networking may help a business succeed in many ways, such as increasing annual sales and facilitating the achievement of set objectives. Regularly, teenagers interact with many forms of media. While social

media does have many positive aspects, it also has many negative aspects that might hurt users. An organization's training efforts can take a hit from inaccurate information, its bottom line can take a hit from poorly targeted ads, users' privacy can be violated by social media companies abusing their power, and young people exposed to irrelevant content may develop an appreciation for violence and other criminal behaviors. Taking use of social media's good features while avoiding its bad ones was crucial if everyone was to reap the benefits of these innovative innovations (Duarte et al., 2020).

REFERENCES:

- Duarte, M. L., Santos, L. R., Guimarães, J. B., & Peccin, M. S. (2020). Learning anatomy by virtual reality and augmented reality. A Scope Review. Morphologie, 104(347), 254–266.
- El-Miedany, Y. (2019). Virtual reality and augmented reality. In Y. El-Miedany (Ed.), Rheumatology teaching (pp. 403–427). Cham: Springer.
- Fernández-Arias, P., Antón-Sancho, Á., Sánchez-Jiménez, M., & Vergara, D. (2023). Statistical analysis of professors' assessment regarding the didactic use of virtual reality: Engineering vs. Health. Electronics, 12, 1366.
- Fragkaki, M., Mystakidis, S., Hatzilygeroudis, I., Kovas, K., Palkova, Z., Salah, Z., Hamed, G., Khalilia, W. M., & Ewais, A. (2020). Tpack instructional design model in virtual reality for deeper learning in science and higher education: from "apathy" to "empathy". 12th Annual International Conference on Education and New Learning Technologies (pp. 3286–3292). Virtual Conference: EDULEARN20.
- González-Zamar, M.-D., & Abad-Segura, E. (2020). Implications of virtual reality in arts education: Research analysis in the context of higher education. Education Sciences, 10, 225.
- Guillén-Gámez, F. D., Cabero-Almenara, J., Llorente-Cejudo, C., & Palacios-Rodríguez, A. (2022). Differential analysis of the years of experience of higher education teachers, their digital competence and use of digital resources: Comparative research methods. Technology, Knowledge and Learning, 27, 1193–1213.
- Hamilton, D., McKechnie, J., Edgerton, E., & Wilson, C. (2021). Implementing immersive virtual reality in higher education: A qualitative study of instructor attitudes and perspectives. Innovative Practice in Higher Education, 4(2), 206–238.
- Kuleto, V., Stanescu, M., Ranković, M., Šević, N. P., Păun, D., & Teodorescu, S. (2021). Extended reality in higher education, a responsible innovation approach for generation Y and generation Z. Sustainability, 13, 11814.
- Lorenzo, G., Lledó, A., Arráez-Vera, G., & Lorenzo-Lledó, A. (2019). The application of immersive virtual reality for students with ASD: A review between 1990–2017. Education and Information Technologies, 24, 127–151.
- Mäkinen, H., Haavisto, E., Havola, S., & Koivisto, J.-M. (2022). User experiences of virtual reality technologies for healthcare in learning: An integrative review. Behaviour & Information Technology, 41(1), 1–17.

- Natale, A. F. D., Repetto, C., Riva, G., & Villani, D. (2020). Immersive virtual reality in K-12 and higher education: A 10-year systematic review of empirical research. British Journal of Educational Technology, 51(6), 2006–2033.