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AN EMPIRICAL STUDY ON THE ADOPTION AND UTILIZATION OF A VIRTUAL LEARNING ENVIRONMENT AMONG STUDENTS IN HIGHER EDUCATION

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Abstract

The adoption and utilisation of (VLEs) in education have revolutionized the way educators deliver content and students engage with their learning. With the dawn of the digital era, institutions recognized the need to transition from traditional teaching methods to more adaptable and flexible platforms, enabling learning beyond the confines of a physical classroom. VLEs, such as Moodle, Blackboard, and Canvas, offer students 24/7 access to course materials, interactive forums, and personalized feedback. These platforms support diverse teaching strategies, facilitate global collaborations, and provide robust analytical tools, allowing educators to monitor progress and tailor interventions. However, while VLEs have significantly enhanced the educational landscape, they also pose challenges. Some educators face steep learning curves, and students without reliable internet access can be at a disadvantage. Yet, as technology continues to advance and institutions invest in training and infrastructure, the potential of VLEs in enriching higher education is immense. In summary, virtual learning environments have positively impacted students by offering greater flexibility, diverse resources, personalization, and opportunities for global collaboration. These advantages have made online education an increasingly popular and effective mode of learning for students of all ages and backgrounds.

Keywords: Digitalization, adoption, virtual learning environment and higher education

Introduction

Virtual learning environments are integrated throughout educational institutions. Hence, it appears inconsequential to inquire on their level of acceptability. Nevertheless, transforming these challenges into a significant enhancement in pupils' academic performance poses a considerable difficulty [3]. Numerous factors exert an influence on students' academic performance, rendering it very challenging to comprehensively identify and evaluate the individual impact of each variable on learning outcomes. The utilisation of learning analytics in higher education is not a new concept, since the industry has historically depended on comprehensive datasets. However, the current analytical systems has the capability to gather significant volumes of data in a centralized and standardized fashion [17]. Furthermore, these systems have the capability to expedite the analysis of data and promote the distribution of analysis results in easily understandable formats. Furthermore, the progress made in the field of learning data mining techniques, along with enhancements in data storage and processing capacities, has facilitated the surpassing of conventional retrospective reports [11]. The advancements made thus far have established a foundation for a hypothetical future whereby it becomes feasible to forecast learning outcomes for potential students, particularly with regards to the likelihood of attrition, obstacles pertaining to assimilation, and impediments encountered during the learning process.

Theoretical overview of the study

Learning analytics plays a crucial role in the realm of virtual learning, providing educators and institutions with valuable insights into student performance and engagement. In virtual learning environments, data is generated at an unprecedented scale, including information about students' interactions with digital resources, participation in online discussions, completion of assignments, and assessment results [14]. Learning analytics harnesses this data to help educators make informed decisions about curriculum design, teaching strategies, and individualized support.By analyzing patterns in student behavior, learning analytics can identify at-risk students early in their virtual learning journey. This proactive approach allows educators to intervene and provide targeted assistance, ultimately improving retention rates and student success. Additionally, learning analytics can offer personalized recommendations to learners, suggesting relevant resources or adaptive learning paths tailored to their individual needs and preferences. Furthermore, institutions can use learning analytics to continuously evaluate and refine their virtual learning programs. Data-driven insights enable educators to identify areas for improvement, optimize course materials, and enhance the overall learning experience [2]. As virtual learning continues to evolve, learning analytics becomes an indispensable tool for both educators and institutions, empowering them to adapt and thrive in the digital age. Interaction is a vital element within virtual learning environments; nevertheless, there exists a dearth of understanding on the precise kind of interactions that facilitate effective learning. The primary objective of this study is to examine interaction data obtained from (VLEs) by employing data extraction and data mining methodologies [8]. The purpose of this study is to ascertain linkages, extract relevant information, and get insights into the learning processes. The emergence of learning analytics as a discipline may be attributed to the convergence of two significant themes. One prominent trend is to the increasing utilisation of virtual learning environments (VLEs) inside educational

establishments. The data is obtained through the acts and activities carried out by the several stakeholders inside the educational institution [5]. The utilisation of analytical tools encompasses theoretical frameworks that analyze the behaviour shown by various stakeholders within the educational setting, and the subsequent influence of these behaviour on educational results. The technologies comprise both physical and virtual elements, encompassing analytical algorithms, reports, and visualization tools that are accessible in many formats. External limitations encompass many customs, practices, and legal obligations that pertain to the realm of data privacy. Finally, internal constraints refer to the competencies and capacities of the many players involved in the learning analytics endeavour.

Purpose of scoping Review

The most pertinent factors are linked to the domain of virtual space, temporal considerations, allocation of resources, and strategic approaches [3]. Virtual Learning Environments provide educational institutions the advantage of accessing substantial amounts of material and effectively managing its dissemination to members, ensuring simplicity, quality, and validity. Virtual Learning Environments (VLEs) include distinct characteristics and capabilities that render them conducive to the exploration, advancement, and facilitation of novel, meticulously designed instructional and educational approaches [1]. It is recommended to consistently observe the dynamic nature of resource utilisation and the accompanying changes, as this enables them to be regarded as a contextual framework for the development of learning processes.

Virtual learning environments have brought about several positive impacts on students, transforming the way they engage with education. Here are some of the key benefits:

1. **Flexibility and Accessibility**: Virtual learning environments provide students with the flexibility to access educational materials and resources at their own convenience. This is especially valuable for those who have busy schedules or other commitments, as it allows them to learn at their own pace.

2. **Diverse Learning Resources**: Online platforms offer a wide array of multimedia resources, such as videos, interactive simulations, and e-books. This diversity of materials caters to different learning styles, making it easier for students to grasp complex concepts.

3. **Self-Paced Learning**: Virtual learning environments often support self-paced learning, allowing students to progress through materials as they master them. This empowers learners to take control of their education and spend more time on challenging topics while moving quickly through familiar ones.

4. **Enhanced Engagement**: Many virtual learning platforms incorporate gamification elements, quizzes, and interactive activities that make the learning process more engaging and enjoyable for students. These elements can boost motivation and participation.

5. **Personalization**: Virtual learning environments can use data analytics to tailor the learning experience to each student's needs. They can recommend additional resources, highlight areas where students need improvement, and adapt content to suit individual learning styles.

6. **Global Learning Communities**: Online learning enables students to connect with peers from around the world, fostering a global perspective and cultural understanding. Collaborative tools and discussion forums facilitate interaction and the exchange of ideas.

7. **Skill Development**: Virtual learning often encourages the development of digital literacy, time management, and self-discipline, which are valuable skills in today's technology-driven world.

8. **Cost-Efficiency**: Online courses and virtual learning environments can be more cost-effective than traditional in-person education, as they eliminate the need for commuting and physical infrastructure.

9. **Accessibility**: Virtual learning can accommodate students with disabilities more effectively. It can provide various assistive technologies and features to make learning accessible to all.

10. **Environmental Impact**: Virtual learning reduces the need for commuting and the use of physical resources like paper, leading to a lower carbon footprint and contributing to environmental sustainability.

Virtual Learning Environments

Virtual learning environments have shown to be highly crucial in facilitating and enhancing formal education, since they are employed within educational institutions to implement the specified educational standards and curriculum of various nations [10]. The current meaning of the term "Innovation" in modern society implies a need for change, revitalization, or the exploration of new activities. The researchers utilised a regression model in order to create a correlation between the amalgamations of data derived from nine degree programmes that are being given at an educational institution in Australia. The study's results revealed that the variables of log count, forum activity count, and resource utilisation were the sole predictors of students' academic achievement that exhibited statistical significance [7]. Prior to employing data logs for the purpose of constructing predictive models regarding students' academic achievement, it is crucial to thoroughly contemplate the discrepancies in technology utilisation, specifically with regards to the way in which students interact with Virtual Learning Environments (VLEs).

Challenges and Concerns:

1. **Technological Barriers**: Not all students have access to high-speed internet or personal devices, leading to digital divides.

2. **Learning Curve**: Both educators and students need to acquaint themselves with the platform, which might be daunting for some.

3. **Engagement**: Keeping students engaged in a virtual environment can be challenging, especially if the content isn't interactive or if students feel isolated.

4. **Assessment Integrity**: There are concerns about the authenticity of online submissions and the potential for academic misconduct in virtual environments.

5. **Over-reliance**: There's a potential risk of educators becoming overly dependent on the VLE, neglecting in-person interactions or other forms of pedagogy.

Future Trends:

1. **Immersive Learning with AR/VR**: As AR and VR technologies become more accessible, VLEs might integrate these tools for a more immersive learning experience.
2. **AI-driven Personalization**: Using AI, VLEs can adapt in real-time to a student's needs, offering resources or exercises tailored to their current level.
3. **Greater Emphasis on Social Learning**: Incorporating more social media elements and gamification can help improve engagement and foster a sense of community.

Significance statement

The rapid advancement of technology has persisted, prompting the current concern over the dissemination of enhanced technologies throughout many application domains [8]. Concurrent with the rapid advancements in technology, there has been a corresponding rise in the integration of technology inside educational practices [3]. Therefore, there has been a growing emphasis on research that examines the adoption and integration of new technologies, especially among student populations [7]. The main aim of this study is to analyze several models documented in the existing literature that pertain to the adoption and usage of information systems.

Design and Methods

The present study employs a quantitative methodology, utilizing a desk review as the major means of data collection [2]. The data was obtained from databases that are connected to student registration system. The collection and retrieval of data were conducted in accordance with the privacy policy of the institution, which encompassed authorization, data access, and confidentiality. Data was collected from 150 students through google form. Simple random technique was used for the study. VLEs are instrumental in facilitating global collaboration, broadening horizons for students and staff alike [6]. Analytical tools embedded within these systems provide educators with real-time insights into student progress, enabling timely interventions and personalized learning experiences [4].

Analysis, Results and discussion of theme

The importance of (VLEs) in higher education cannot be overstated. In a rapidly evolving digital age, VLEs stand as a testament to the power of technology to enhance learning. These platforms offer unprecedented flexibility, allowing students to access course materials and participate in learning activities irrespective of time or geographic constraints. They cater to diverse learning styles through multimedia content, interactive quizzes, and discussion forums, thus promoting inclusivity. Moreover, Furthermore, VLEs play a pivotal role in ensuring continuity of education in unforeseen circumstances, such as during global pandemics or natural disasters. In essence, VLEs are reshaping the

contours of higher education, making it more accessible, engaging, and adaptive to the needs of the 21st-century learner.

Table 1: The adoption and utilisation of a virtual learning environment among students

Variables	Mean	Std. Deviation	Mean Rank
Digital Revolution	3.01	1.031	4.07
Accessibility & Flexibility	3.96	1.273	4.21
Enhanced Pedagogy	2.81	1.124	3.98
Collaboration & Interaction	2.95	1.359	3.19
Tracking & Analytics	3.33	1.216	3.76
Standardization & Scalability	3.06	1.242	4.09
Integration with Other Tools	3.21	1.314	3.07

Acceptance and use of a virtual learning environment is Accessibility & Flexibility ranked first (4.21). Standardization & Scalability is rated at 4.09, which is followed closely by Digital Revolution rated at 4.07. **Digital Revolution**: With the advancement of digital technology, there has been a paradigm shift in the way we access and share information. Students are now digital natives, and educators recognize the need to meet students in their digital realm. **Accessibility & Flexibility**: VLEs allow students to access course materials, resources, assignments, and feedback from anywhere at any time. This flexibility is especially important for non-traditional students, those working while studying, or those in different time zones. **Enhanced Pedagogy**: VLEs support a wide range of teaching strategies, from discussion forums to quizzes, multimedia content, and simulations. They cater to different learning styles and can be used to flip the classroom, allowing for more interactive in-person sessions. **Collaboration & Interaction**: Discussion boards, collaborative wikis, and group assignments are much easier to coordinate within a VLE, facilitating interaction among students and between students and instructors. **Tracking & Analytics**: Educators can monitor student progress, assess participation, and identify at-risk students. This data-driven approach helps in providing timely interventions and personalizing learning experiences. **Standardization & Scalability**: Institutions can standardize the delivery of specific courses across departments or even campuses. This aids in quality assurance and scalability, especially in large institutions. **Integration with Other Tools**: Modern VLEs can integrate with a plethora of third-party tools, from plagiarism detection software to virtual laboratory simulations. The statistical significance of the ranking result is assessed using Kendall's W test, as outlined below.

Table 2: Kendall's Coefficient of Concordance

N	150
Kendall's CC	0.011
Chi-Square	16.392
difference	6
Asy. Sig.	0.021

The Chi-Square test yielded a computed value of 16.392 for a degree of freedom of 6, which is deemed statistically significant at the 5% level. Therefore, it may be inferred that there is a considerable correlation between uses of a virtual learning environment among students.

Conclusion

The popularity of online learning has increased due to its capacity to offer flexible access to educational information and teaching, unrestricted by time or location [8]. The primary objectives often involve (a) enhancing access to educational opportunities for individuals who are unable or opt not to participate in conventional in-person courses, (b) optimizing the cost-effectiveness of creating and distributing instructional materials, or (c) enabling educators to accommodate larger student populations while ensuring that the quality of learning outcomes remains on par with those achieved through comparable face-to-face instruction [2]. The progress in computer technology has enabled the electronic modelling of many learning contexts. The benefits of virtual learning environments (VLEs) outweigh the limitations for both students and educational institutions [3]. The use of context-rich guided learning strategies allows students to acquire knowledge in a meaningful and immersive manner, fostering the development of problem-solving skills that can be effectively utilised in practical situations. Nevertheless, it is crucial to evaluate the impact of the Virtual Learning Environment on the educational outcomes and identify the requisite approaches to augment its efficacy [12]. (VLEs) serve a broader purpose than mere information dissemination, since its objective is to foster an interactive and collaborative learning atmosphere for students. Virtual Learning Environments (VLEs) have a crucial impact on the creation of training courses that concentrate on fundamental occurrences within safe and controllable environments [14]. However, it is crucial that students are given the opportunity to experience the same stimuli that they would encounter in a genuine professional setting.

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