



EXPLORING EDUCATION IN THE DIGITAL AGE: INNOVATIONS, INTERSECTIONS AND INSIGHTS

PREFACE

Dear esteemed readers and contributors,

It is with great pleasure and excitement that I extend a warm welcome to you all to this special edition of our journal, dedicated to exploring the diverse and dynamic themes shaping the landscape of education in the digital era. As we embark on this journey of discovery, each theme serves as a guiding beacon, illuminating the innovative intersections of technology and pedagogy.

Our first theme, Teaching based on Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), sets the stage for our exploration by delving into the transformative potential of intelligent technologies in education. From personalized learning experiences to predictive analytics, AI, ML, and IoT hold the promise of revolutionizing traditional teaching methods and unlocking new pathways to knowledge acquisition.

Theme 2 invites us to immerse ourselves in the realm of 360 Learning, Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Here, we witness the fusion of physical and digital worlds, as learners embark on immersive journeys that transcend the confines of the traditional classroom. Through experiential learning and interactive simulations, VR, AR, and MR technologies redefine the boundaries of education, offering unprecedented opportunities for engagement and exploration.

In Theme 3, we explore the power of Collaborative Teaching, Global Learning, and innovative practices such as Gamification, Maker-Space, and Maker Lab initiatives. This theme underscores the importance of collaboration, cultural exchange, and hands-on experimentation in fostering creativity, critical thinking, and problem-solving skills among learners worldwide.

Theme 4 sheds light on the paradigm shift towards Open and Distance Learning (ODL), Self-Instructional Materials (SIM), and the utilization of Big Data Analytics in Learning. Here, we witness the democratization of education, as learners gain access to high-quality resources and personalized learning experiences irrespective of geographical constraints. Big Data analytics further enhance the educational landscape by providing insights into learner behavior and preferences, enabling educators to tailor instruction to individual needs.

In Theme 5, we explore the evolving role of Social Media Learning as a catalyst for knowledge dissemination, collaboration, and community building. From online forums to multimedia platforms, social media offers a dynamic space for peer-to-peer learning, digital literacy development, and the cultivation of virtual learning communities.



Theme 6 invites us to embrace Design Thinking for new Learning Delivery, emphasizing the importance of user-centered design principles in creating innovative and inclusive learning experiences. Through empathetic design, educators can reimagine learning environments that foster creativity, adaptability, and lifelong learning skills.

In Theme 7, we delve into Andragogy in technology-based learning, Instructional Design, and Best Practices in e-learning. This theme highlights the importance of learner-centered approaches, effective instructional design strategies, and the dissemination of evidence-based practices to optimize learning outcomes in the digital age.

Finally, Theme 8 explores the Development of e-learning systems, materials, and mobile technologies, including the emergence of MOOC-based mobile learning materials. Here, we witness the evolution of educational technologies, as mobile devices and online platforms redefine the boundaries of access and engagement in education.

As we navigate through these diverse themes, let us embrace the spirit of inquiry, collaboration, and innovation that defines our scholarly community. I extend my deepest gratitude to all the contributors who have enriched this journal with their insights and expertise. May this edition inspire new ideas, spark fruitful discussions, and contribute to the ongoing dialogue surrounding the future of education.

Thank you for your dedication and commitment to advancing the frontiers of knowledge in the field of education.

PROFESOR MADYA DR. ZAINUDDIN IBRAHIM

Guest Chief-Editor

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Theme 1: Teaching based on Artificial Intelligence (Ai)/ Machine Learning (ML)/ Internet of Things (IoT)

1. Factors influencing the Internet of Things (IoT) implementation in fieldwork courses
2. Exploring the Potential of Artificial Intelligence in Chemical Engineering Education

Theme 2: 360 Learning/Virtual Learning Virtual Reality/Augmented Reality & Mixed Reality

1. Interactive 360-Degree Virtual Reality: The Acceptance among Educators and Learners in Public Higher Education in Malaysia
2. Post pandemic conceptual study on virtual learning method (VLM) in chemical engineering related courses

Theme 3: Collaborative Teaching or/and Global Learning/A.D.A.B in Teaching and Learning/ Gamification in Teaching and Learning/Maker-Space/ Maker Lab

1. The Implementation of Service-Learning Malaysia-University for Society (SULAM) Programme at Universiti Teknologi MARA Perak Branch, Malaysia
2. Group Conflict: Exploring Forming and Storming in Group Work
3. Incorporating the Concept of A.D.A.B into Curriculum Design: A Reflection Journey
4. Digital Game-Based Value Learning Model for Management Students in Malaysian Higher Education Institutions
5. A Systematic Literature Review of the Sustainable Transformational Leadership Practice and Relevant Impacts on School Teachers' Organisational Health
6. Exploring Optometry Students' Perspectives on Satisfaction within the Clinical Learning Environment
7. Exploring the Potentials of Robotic Inclusive Education in Supporting Students with Disabilities

Theme 4: Open and Distance Learning (ODL)/Self Instructional Materials (SIM)/Big Data Analytics in Learning

1. Adaptive Learning in the Age of COVID-19: Exploring Psychomotor and Cognitive Impacts on Open and Distance Learning (ODL)
2. Programme Outcomes Attainment towards Psychomotor Skill Development during Open Distance Learning in Engineering Laboratory Courses

Theme 5: Social Media Learning

Theme 6: Design thinking for new Learning Delivery

1. Leading the Way: Self-Directed Learning and Leadership in University Student-Leaders

Theme 7: Andragogy in technology-based learning/Technology in learning/Instructional design in learning/Best practices in e-learning

1. Challenges and Innovations: Adapting Practical Culinary and Foodservice Subjects for Distance Learning during COVID-19
2. Exploring Tertiary Education ESL Learners' Dependency on the Internet, Internet Sources, and Internet Source Reliability

Theme 8: Development of e-learning system/Development of e-learning materials/Development of mobile systems in Learning/Development of MOOC-based mobile learning materials

1. Student Acceptance with the Usage of Padlet in Guiding Research Statistics Analysis
2. MOOC Courses Development: Guidelines for GLAM MOOC

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Interactive 360-Degree Virtual Reality: The Acceptance among Educators and Learners in Public Higher Education in Malaysia

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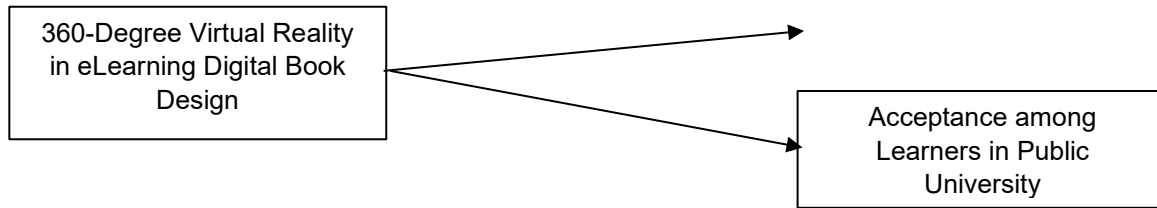
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ABSTRACT

Due to a lack of resources, tools, and expertise among Malaysian educators, it is challenging to prepare software and applications for studying digital design content. Additionally, despite the completion of the knowledge transfer, there is still scepticism about its acceptance among instructors and students. As a result, the current study intends to investigate whether educators and students in public higher education in Malaysia are accepting of eLearning in digital book design. In the current study, a structured interview will be used, and participants will include educators from three (3) public universities in Malaysia: Universiti Teknologi MARA (UiTM), Universiti Pendidikan Sultan Idris, and Universiti Malaysia Kelantan (UMK). Between the instructors and students, there are 12 informants. Following the transcription process using the informants' data, the keywords used by the informants will next be categorised according to internal and external parameters. To accomplish this, all of the information gathered from the informants was analysed using thematic analysis. The study discovered challenges in using 360-Degree in virtual reality to teach the subject because of the accessibility of 360 software, the lack of supportive infrastructure,





The development of digital media technology has aided in the electronic evolution of educational resources, which is evident in the inclusion of original digital content that seamlessly combines text, images, music, videos, animations, and virtual reality (VR) components (Ran & Jinglu, 2020). The use of computers and other intelligent terminals, such as mobile phones and tablets, has led to a substantial increase in the level of engagement between learners and e-learning materials. The acquisition of knowledge in digital design includes educational encounters utilising augmented reality. The learner's experiences vary according to three distinct aspects, namely technology, software, and content (Ismail et al., 2023). Thus, it is expected that educators and learners will improve in these areas.

Technologies are one prominent aspect of using 360-Degree virtual reality. The selection of a particular device has a direct impact on the suitability of software and content. Desktop systems possess larger screens and enhanced processing capabilities. Using e-learning in the field of digital design necessitates the utilisation of substantial hardware resources, including desktop computers and high-resolution screens. Therefore, in order to realise e-learning, the facilities of one institution must be at par and meet the requirements to ensure smooth delivery. Moreover, software plays a crucial part in 360-Degree virtual reality. Adobe Package is well recognised as the predominant programme utilised in the field of learning design for educational purposes. This software is considered to be the most user-friendly software in the field of design, and learners are able to comprehend its usage well while utilising the Adobe package. Nevertheless, the utilisation of 360-Degree virtual reality poses significant challenges due to the lack of specific software designed specifically for this purpose.

Unified Technology Acceptance and Use of Technology (UTAUT)

The unified theory of acceptance and use of technology (UTAUT) is a technology acceptance model which was used widely among researchers in identifying factors of acceptance of one new technology and its use behaviour (Venkatesh et al., 2012). Therefore, the present study also adopted UTAUT as a theory to guide the present study. The use of UTAUT is not limited to studies that employ the quantitative method; it is also widely used in qualitative research to explore factors that contribute towards technology acceptance and use. A study conducted by Ustun et al. (2023) on the acceptance and use of virtual reality technology among university students shows positive acceptance among them, followed by Alotaibi (2023) on the wide use of VR technology in the education and training field. This evidence shows the relevance of the theory used in measuring the acceptance of virtual reality in the context of the education field. Thus, it also signifies factors used in the interview questions employed in the present study.

Educators and Learners Acceptance in 360 Degree Virtual Reality

The acceptance of 360-Degree virtual reality among educators and learners in Malaysia specifically has been a prominent topic discussed in much research in recent years. Due to its potential to transform education by providing an immersive and engaging learning experience to both learners and educators, it has actively been discussed (Pirker & Dengel, 2021). This is supported by its positive impact on learners, which allows them to explore complex concepts and scenarios. Thus, it encourages educators to embed this in their teaching, which later has resulted



in positive outcomes in terms of learner engagement and comprehension among the millennials and future alpha generation (Ziatdinov & Cilliers, 2021). The positive impacts have been challenged with a few challenges faced by the educators. Due to the generation gap between educators and learners, educators are required to be equipped with training in order to use the technology effectively.

Learning new technology can be time-consuming and can have other technical constraints (Blattgerste et al., 2021). Scholars found that the educators' acceptance of 360-Degree virtual reality has elicited mixed reactions. Some educators embrace new technology enthusiastically while others are skeptical and resistant. The resistance to adopting new technology, as educators are accustomed to traditional teaching methods, presents challenges that need to be addressed. Meanwhile, some educators resist adopting it due to doubt on its effectiveness. Learners in higher institutions among the millennial generation are excited about the prospect of using 360-Degree VR technology, and they found that the technology helps them as it is memorable for their in-study grasp (Pirker et al., 2020). However, similar to learners, they found that some students face barriers and issues related to accessibility to technology. This will also affect their acceptance of 360-Degree VR in education as the drawbacks of the technology can be expensive to implement, and not all subjects or topics are suited for 360-Degree VR experiences.

In conclusion, the acceptance of 360-Degree virtual reality in university settings depends on various factors, including the readiness of educators and learners, the availability of resources, and the alignment of 360-Degree VR with pedagogical goals. As technology continues to advance and educators gain more experience with 360-degree virtual reality, its acceptance and integration into higher education are likely to continue to evolve.

METHODOLOGY

The data for this study was obtained through the use of a structured interview. This study examines the perception of virtual reality as a learning tool among both learners and educators. The study would involve the inclusion of educators from three public universities in Malaysia, namely Universiti Teknologi MARA (UiTM), Universiti Pendidikan Sultan Idris (UPSI) and Universiti Malaysia Kelantan (UMK). There are a total of 12 informants, comprising both instructors and learners. A structured interview, in its primary manifestation, entails an individual posing a series of pre-established inquiries to another individual, pertaining to meticulously chosen subjects. The investigation was carried out based on the research topic, and all informants were presented with identical questions in a consistent manner. The research methodology under consideration exhibits a high degree of standardisation and possesses the potential to serve as a robust tool for formative assessment. Structured interviews are a valuable method for delving into the perspectives of respondents, which researchers aim to investigate in greater depth.

The formulation of the question was derived from two primary study objectives, with two corresponding questions for each specific detail. The questions were adapted from a previous study that focused on the acceptance of technology. The sampling method employed in this study is purposive sampling, similar to a previous study on the use of VR to its specific informant in the tourism industry (Çolakoğlu et al., 2023). The researchers first determine the necessary



information and subsequently seek out individuals who possess relevant expertise to provide that information. Therefore, the current investigation centered on educators possessing over five years of professional experience and expert knowledge of editing and design. This approach enhances the understanding of the provided data and systematically organises the concepts expressed by the informants.

In this phase, the thematic analysis will be conducted using a procedural framework consisting of six steps. According to Braun and Clarke (2006), the initial part of thematic analysis involves familiarising oneself with the data. The research process consists of several phases. Phase 2 involves the generation of initial codes, while Phase 3 focuses on the search for themes. In Phase 4, the identified topics are reviewed, and in Phase 5, they are defined and named. Finally, Phase 6 involves the production of the research report. Thematic analysis is a research approach that involves identifying, classifying, and providing an understanding of recurring patterns of significance or themes within a given dataset (Jnanathapaswi, 2021). Moreover, the utilisation of thematic analysis enables the researcher to comprehend and depict the underlying meanings and experiences by directing attention toward the intentions present within a given dataset (Braun & Clarke, 2006).

Table 1. Interview Questions for Educators / Learners

Items	Questions	Sources
Q1	As an educator/learner do you find 360-Degree virtual reality easy to use in the classroom?	Venkatesh et al. (2012)
Q2	Does using 360-Degree virtual reality enable you to educate/learn design quickly in the classroom?	Venkatesh et al. (2012)
Q3	Do you think that using 360-Degree virtual reality offers stability of interaction in educating and learning?	Dalim et al. (2017)
Q4	Does curriculum and workshop have been offered to you to upgrade your skills as an educator/learner?	Venkatesh et al. (2012)
Q5	Do you find the necessary assets within the faculty to efficiently use the 360-Degree virtual reality?	Venkatesh et al. (2012)

FINDINGS



ROI: To explore factors contributing to the acceptance of 360-Degree virtual reality in eLearning Digital Design among educators in public universities in Malaysia.

Incorporating virtual reality technology into educational settings is indeed a commendable proposition. However, the facilities must be modernised and designed for enhanced usability. According to numerous educators, learners express acceptance of the incorporation of virtual reality technology in the pedagogical and learning processes. However, due to a lack of framework and skills, the learning process is limited. The educators expressed their willingness to incorporate virtual reality into their instructional practices, albeit not as the primary focus of the learning experience. In order to acquire proficiency in design, individuals must possess a comprehensive understanding of the sequential stages involved in the design process, as well as the practical skills necessary for its execution. This knowledge and hands-on experience significantly facilitate the learning of design principles.

The integration of 360-Degree virtual reality technology has the potential to enhance the interactivity and engagement of the teaching and learning process. Instructors and learners would be inclined to utilise this system within their classroom, provided that the necessary hardware and software are adequately provided in the future. From the educator's perspective, the facilitation of virtual reality necessitates a significant amount of effort. Most educational programmes or subjects require a preparation period of at least six months to one year before they can be implemented in the classroom. The creation of this system necessitates the involvement of multiple individuals.

“Yes, we already started using virtual reality in classes, but it was just for simple topics. I dedicated nearly a year to the development of a single subject for instructional purposes because I have a limited capacity for module preparation in terms of teaching design. Skills and knowledge will be the biggest factor in accepting virtual reality”. Informant 1

“It is not easy. The application is widely known in name, but applying the teaching aspects of it is quite hard. Most students that I have thought never encountered or used the most basic virtual reality”. Informant 2

“Yes, universities do provide some classes for educators, but the main concern about virtual reality is that the devices and hardware are still lacking. Not all faculties are able to have their own devices and hardware”. Informant 4

Table 2. Thematic Analysis - ROI



RO 1: To explore factors contributing to the acceptance of 360-Degree Virtual Reality in eLearning Digital Design among educators in Public Universities, in Malaysia.

General Theme	Subtheme	Numbers of Informants
Knowledge	Skills	5
	Theory	1
Total Number of Informants		6
Module	Curriculum	3
	Framework	3
Total Number of Informants		6
Technology	Hardware	4
	Software	2
Total Number of Informants		6

RO2: To explore factors that contribute towards acceptance of 360-Degree Virtual Reality in eLearning Digital Design among learners in Public universities in Malaysia.

The findings indicate that a majority of the learners derive acceptance from utilising virtual reality but there are a few obstacles that they need to face using this technology. The majority of the participants indicated that they encounter several challenges when utilising 360-Degree virtual reality. These challenges include experiencing both positive and negative feedback.

Through the use of 360-Degree virtual reality, the learner feels a sense of enjoyment in the educational process. The learning process becomes easier to understand when 360-Degree virtual reality gives the learners an experience. Due to their youth, the process of adapting to technology is considerably easier. Motivation is the key determinant for utilising 360-Degree virtual reality technology. Since their educators motivate and expose them to technology from a young age, they typically have no trouble embracing it in the classroom. The concept of 360-Degree virtual reality can be deemed accessible to those who have grown up with technology and are considered digital natives. Conversely, individuals who have adapted to technology later in life, otherwise known as digital immigrants, may find the concept more challenging to comprehend.

On the contrary, it appears that many of the courses provided by the faculty fall short of providing students with a comprehensive understanding of this particular technological field. Although the faculty does encourage the use of such technology, the devices provided are often

insufficiently prepared for the task at hand. As a result, many learners find themselves struggling to engage with the material at hand fully.

“I enjoy using Virtual reality for educational purposes. But somehow, I don't have access to software or devices. It can only be used in our smart classroom”. Informant 1

“The instructor often suggests using virtual learning to explore new topics and ideas. But, I understand that it can take a while to learn how to use the software and hardware needed for virtual learning”. Informant 2

“I guess not all subjects are suitable for using Virtual Learning. I prefer to have face-to-face communication while engaging with my instructors”. Informant 3

Table 3. Thematic Analysis-RO2

RO 2: To explore factors contributing to acceptance of 360-Degree Virtual Reality in eLearning Digital Book Design among learners in Public Universities, Malaysia.

General Theme	Subtheme	Numbers of Informants
Motivation	Easy to use	1
	Stability of usage	5
Total Number of Informants		6
Learning Process	Easier	0
	Harder	6
Total Number of Informants		6
Technology	Hardware	6
	Software	0
Total Number of Informants		6

DISCUSSION AND CONCLUSION

The utilisation of 360-Degree virtual reality has gained acceptance among educators and learners; nonetheless, there are certain deficiencies in its implementation. The instructor should establish a framework and basis for teaching and learning 360-Degree virtual reality to ensure that learners can effectively acclimatise to this technology. In addition to the pedagogical framework, the cultivation of skills is also a crucial component in effectively instructing students. Educational professionals must demonstrate readiness to embrace technological advancements and have a willingness to further enhance their skill sets in the forthcoming years (Abdeldayem & Aldulaimi,



2020; Dhanpat et al., 2020; Salmon, 2019). Besides, it is necessary for universities to establish a learning atmosphere that is conducive to the development of knowledge pertaining to 360-Degree virtual reality, as this particular technology necessitates the utilisation of a designated spatial setting (Chen & Liao, 2023; Chiu et al., 2023; Eiris et al., 2020).

The utilisation of 360-Degree virtual reality technology remains relatively novel within the realm of educators and students. To gain a comprehensive understanding of design through the use of virtual reality, it is imperative to acknowledge that both instructors and learners may encounter problems. However, instructors can overcome these problems and effectively prepare themselves for the future through the development of their skills and knowledge in the field of education.

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