The Efficiency of UTAUT2 Model in Predicting Student's Acceptance of Using Virtual Reality Technology

https://doi.org/10.3991/ijim.v17i12.36951

Ghaliya Al Farsi
College of Graduate Studies, Univiersiti Tenaga Nasional, Kajang, Malaysia
Al Buraimi Univirsity College, Al Buraimi, Oman
galfarsi@buc.edu.om

Abstract—In this research paper, the impact of the theory Unified Theory of Acceptance and Use of Technology UTUAT2 in virtual reality System (VRS) was discussed. Virtual reality (VR) has emerged as a major tool in this field of research and education development. This study integrates UTAUT2 and the learning value architecture to extend the UTAUT2 framework and provides a new perspective on predictions of students' behavior intentions towards and use of VRS. Quantitative Method used in this research as an approach in this study by using a closed questionnaire to collect data from many differences Omani universities. The students who have previously used a virtual reality system. The results of the descriptive analysis showed that the factors that used from UTAUT2 improve student outcomes and raise their educational as it was tested and evaluated with satisfactory results using advanced (PLS-SEM) tools and SPSS analysis program.

Keyword—UTAUT2, technology learning, virtual reality system, students' performance

1 Introduction

The applied study includes an applied research problem facing the administration or the rest of the participants. Regarding the management of the Moodle system at the universities, the decision problem facing the students is represented in the low acceptance of students for the Moodle virtual reality system, and based on this problem, it can be reformulated in the language of scientific research as follows (Determining the factors affecting students' behavior of the Moodle virtual reality learning system). Questions and Objectives of the Study Several theories and models have emerged related to determining the factors that affect users' acceptance of technology, the most prominent of which is the Unified Theory of Acceptance and Use of Technology UTUAT ,which describes it that It has the ability to give the full picture of the determinants of technology acceptance, but the current study adopts the UTUAT2 model, which is able to identify the determinants of technology acceptance among both teachers and students and is characterized by a high predictive power that reached in the original study of the model . The study questions were described using the UTUAT2

theory in line with the study problem. This study aims to. Determining the extent to which students accept the Moodle virtual reality learning system at the Universities. Determining the direct effects of the UTAUT2 model variables on the intention behavior and use the Moodle virtual reality learning system [1] [2].

Determining the level of efficiency of the UTAUT2 model in predicting student acceptance of the virtual reality learning system. Moodle Determine the effect of the interactive variables of a mode UTAUT2 in accepting the virtual reality learning system. Blackboard, also called "online learning management system" is a customizable online learning tool that can act as a substitute or supplement to the traditional face-to-face learning process in a school, university or any other classroom. It is worth noting that every function in the traditional learning process has a corresponding board equivalent, allowing students and teachers to simulate every element of the physical classroom experience. Board technology can be used as a complete alternative to the learning process, and in this case the entire learning process takes place on the Internet. Where the teacher uploads the educational material digitally, communicates with students online, and provides an opportunity for discussion and dialogue via the Internet [3] [4].

On the other hand, one of the most important board applications comes in the form of a supplement to the learning process. The students and the teacher meet on the ground a few times, and later on, board activities are used to complete the learning process. A third way to use Board technology is through the Web-enhanced learning model where the teaching is face to face (in the traditional way) and teachers post online support materials, assignments or discussions on the Board Learning Management System. Board hosts many virtual and digital learning tools, but the system revolves mainly around the main component, which is the lessons or training courses. The courses in the Board system are accessed through a special account that the student opens on the Board platform, where he can view them by clicking on "My Courses" in the main interface of the system. These courses (or lessons) are supported by different tools, each of which focuses on a specific aspect of the classroom experience and includes the following: 1- Content Teachers can publish content including: files, texts, audios and videos on the platform, and then arrange it using templates Learning Models, folders, or lesson plans. To help students navigate through lessons and courses, teachers can add an outline of the syllabus that includes a description of the course (or syllabus in general), assignments, the grading system and any other information they may find useful for their students. Other forms of content that you may find on the Board platform include opinion polls, tests and homework [5] [6].

Here it is worth noting that opinion polls are highly customizable as they may come in the form of multiple choices, or they may be temporary and may include written questions answered by the student. Announcements & Calendars Board offers several ways for students and educators to stay on track throughout the semester. Teachers can post announcements and alerts about any changes to the syllabus, the due dates of reports and assignments, exam schedules and schedules, and more. Students can view all these alerts through the home page of their personal account on the Board platform. Interaction & Discussion Teachers can set up discussion boards in their virtual board classroom, where both students and teachers can start a new discussion or respond to

the main discussion topic. Students can also send private messages directly to each other by clicking on the "Messages" option in their lesson menu [7].

Not only that, teachers can also create groups for their students so that they can complete joint projects, discuss and share assignments and references. Students can also contact their teachers in person and submit assignments for them to be graded and graded. Finally, Board technology provides the ability to hold video conferencing, which is called Board Collaborate, as this service allows the possibility of holding virtual group or individual discussions to enhance the overall educational experience. Board Ultra is a cloud service somewhat similar to Google Workspace or Dropbox, which allows modifications and changes to the original files instead of having to download and modify them and then re-upload them. Board mobile applications You can take advantage of the Board through its mobile application to facilitate the learning process [8].

in other words, you can study from anywhere and at any time as long as your smartphone is with you. All Board applications including Board and Board Instructor are compatible with Android and iOS platforms. Once you download the app, you will be asked to enter the name of your educational institution and your personal Board account information to start using it right away. Accessibility Tools Educators can improve the accessibility of study materials on Board by designing content to suit the needs of people with hearing or mobility impairments or even those with learning disabilities. The Board application provides many quick access features such as the ability to browse through Voice-over navigation, increase the font size and visual elements, and color filters. Which is easy to use by everyone with different abilities or problems they suffer from.

The need to encourage the higher management of the learning institution and colleges to use the virtual reality learning system [9]. Developing the technological infrastructure at the school and universities in order to expand the scope of the intranet service and work to increase its speed within the school corridors and universities [10]. Spreading the culture of using the constructivist theory in education, which was adopted as a basis for designing the virtual reality learning system. It leads to attracting users towards using the system. Work to increase students' use of the virtual reality learning system in the size that makes them get used to using it automatically, by encouraging the use of virtual reality learning applications such as Moodle and board, which are available free of charge on smart phones. The need to pay attention to students who are ready to use.

2 Literature review

The use of technology and the Internet environment in teaching is one of the modern pillars that have captured a lot of research worldwide in general. In this study, will address some studies that reviewed the use of technology in general in education and the Board system in university education in particular.

[11] made an exploration on how VR technology influences consumers' brand perceptions and their purchasing intentions. Study 1 which uses a real brand, showed

that consumers tend to make stronger self-brand relationships and purchasing decisions when they see themselves reviewing a product in a simulated mirror - rather than watching professional models wearing a product. Meanwhile Study 2 utilized a fictitious brand, revealing that narcissistic participants reported positive effects of self-examination while contrastingly, non-narcissistic participants reported attenuated effects [11].

Not to be forgotten, [12] discussed on the Knowledge transformation (KT) effect of conditions impacting the implementation of VR and identified the treatment needs of therapists. The hypotheses are that the approach will be associated to improvements in the perceived ease of use and self-efficiency of physicians as well as a consequential improvement in the intention to use VR. KT methods included the potential to target therapists' perceptions of low self-efficiency and ease of use of this technology. Multiple evaluations and multi-phased preparation programmers were carried out to address the demands of practitioners over time, changes in future problems, facilitators, and goals of counselling post-test treatment.

One of the first studies that dealt with the use of the electronic information network in supporting university teaching is a study, where the researcher designed educational materials on the Internet, which included the course and office hours he was studying, and he communicated with his students via the Internet as electronic office hours. The study concluded that the use of such this style of teaching that supports and supports traditional teaching improves the way the subject is taught, makes it easier for students and increases their understanding.

Among the studies that dealt with the subject is the study which dealt with the experience of e-learning as an evaluation study to find out the extent of benefit from this experience for female students and the extent of female teachers' readiness and qualifications for this, and to determine the opinions of female and male teachers about the advantages and disadvantages of e-learning. In this study, the researcher used the descriptive approach, as the sample included female teachers and female students. The most important finding of the results in this study is that there are relatively minor differences in favor of the electronic method in comparison with the achievement of students between traditional and electronic. The study also proved the positive opinions of female teachers and students regarding electronic learning. The study showed that the e-learning contributes to increasing the teacher's ability to communicate information to the students in an easier way, thus reducing dependence on textbooks and traditional illustrative aids. The views of the students also increased that e-learning contributes to increasing the student's comprehension of the course and raises the students' enthusiasm for discovering knowledge.

Among the factors that can further improve student outcomes and raise their educational level. The distance learning system where used the distance learning system at government schools [13] [14], to study some demographic characteristics such as age and gender, and to show the extent to which they are related to the level of benefit from distance learning, and after conducting the study and analyzing the data, it was found that the level of satisfaction Flexibility in time and place is very high while studying courses in the distance learning system. The study also did not find any statistical

significance in the demographic characteristics that are related to the level of benefit from this method of learning [15] [14] [16].

Among the studies that dealt with the subject is a study [14], which summarized the point of view of students and university professors in evaluating the use of e-learning. The results of this study showed that there is an improvement in the level of performance of students and there is a desire among professors to use distance learning in other subjects they teach, as is the case with students.

many studies aimed at investigating the tendencies of students, and the results of the study proved the existence of statistically significant differences in students' attitudes due to the study variables as a whole. and proved that the attitudes of female students are higher than male students, and also students with experience in dealing with virtual reality learning are higher than students with less experience. Moreover, indicated that students who own a personal computer have higher positive attitudes towards e-learning.

3 Methodology

The current study will use Descriptive analysis includes measures of central tendency and dispersion using SPSS, and in partial least squares modeling (PLS) through partial least squares (SEM \ SmartPLS program that is preferred to be used when predicting and identifying influencing factors and is characterized by its ability to analyze complex models. For the purpose of assessing the quality of the scale and testing hypotheses. For me, there is currently only one reliable criterion for the quality of the PLS path model match, which is the standard root mean square R^2, when its value is 0, it indicates a perfect match , while the acceptable value for it when it is less than 0.70 and using SmartPLS software, the SRMR value was 0.70 which is an acceptable value.The evaluation of the quality of any measure includes reliability testing And the validity. Measurement model evaluation includes testing for internal consistency and validity of the Validity Construct variable, which includes two types: proximity honesty and discrimination honesty. The next step is to build a structural model using SmartPLS software which includes an evaluation of the structural model, examining the predictive ability of the model and the relationships between variables, the following are the necessary steps for evaluation. collinear relationship. Evaluation: Limits linear correlation when there is a significant correlation between two independent variables. The 500 students fill the survey that distributed through the google form software. All this samples students from universities that used virtual reality technology.

4 Finding and discussion

Quantitative Method used in this research as an approach to our study by using a closed questionnaire to collect data from many Omani universities. The students who have previously used a virtual reality System. The study polled 500 students and analyzed the results with advanced (PLS-SEM) tools. As shown in the table.

Table 1. Sample Study Response Rate

Questionnaire response	Frequency	Rate (%)
Number of questionnaires distributed	500	100

Table 2. Demographic Profile of Respondents

Demographic Factor	Category	Frequency	Percent
Degree of Scientific	Diploma	182	39
	Bachelor	318	61
Gender	Female	339	63
	Male	161	37

The results of the descriptive analysis showed acceptance of the virtual reality learning system, as the responses of the respondents are limited to the agreement regarding the variable of intention to behavior and the variable of use of the virtual reality learning system. In addition, the factors of ease and intention to behavior have a positive significant effect on the use of the behavior learning system for students. The factors affecting the adoption of the virtual reality learning system included the intention to behavior, and the others factors that includes in UTAUAT2 keeping pace with technology. And the applicability of the using UTAUT2. This study's statistics reveal that each of the variables evaluated has a good level of acceptance. with sginficante value as in reliable criterion for the quality of the PLS path model match, which is the standard root mean square R^2, when its value is 0, it indicates a perfect match , while the acceptable value for it when it is less than 0.70 and using SmartPLS software, the SRMR value was 0.70 which is an acceptable value. These investigations on the use of VR in a variety of educational areas yielded positive results and empirical evidence for its potential applications in the classroom. As a result of these investigations into the use of virtual reality in a variety of educational fields, positive results and empirical evidence for its potential applications in the classroom are encouraged. We encourage its continued use in the future. According to [17], calculating the mean, variance, and standard deviation can give researchers with a wealth of information about their research participants as well as responses. These assessments are mostly classified as descriptive statistics. In light of this, the descriptive analysis performed in this study explained and summarised the primary data set's essential aspects.

Table 3 contains information about the descriptive analysis tests' results. According to the table, all of the variables' mean values result ranging from 3.6252 to 3.4958 and the descriptive analysis revealed standard deviations ranging from 0.72121 to 0.80251. This study's statistics reveal that the variables evaluated has a good level of acceptance.

Table 3. Descriptive Statistics

Variables	Mean	Std. Deviation
intention to behavior	3.6252	.80251
Virtual reality	3.4958	.72121

5 Conclusion

This study uses a case study to focus on understanding the foundation and structures of VR applications being adopted in several universities in Oman. The results of the descriptive analysis showed that the factors that used from UTAUT2 improve student outcomes and raise their educational as it was tested and evaluated with satisfactory results using advanced (PLS-SEM) tools and SPSS analysis program. The development taking place in information and communication technology is more complex than the developments. And the world of tomorrow is a world.as well based on biting the bite, and reliant on approved continuous. The world of yesterday and the world of today. On the rapid shifts in learning and its quality in an environment characterized by intense competition, and rapid progress in science. Technology and the exchange of knowledge and information. Therefore, the query must be questioned about learning today to prepare a generation. Good by searching for Standards Educational, where the development of the application of standards appropriate to the requirements of life at the present time is on the list of priorities to improve an element of learning basically and renewal of the educational system. Thus, learning standards became an element and its quality. And because the style of our life today is clear, the role of advanced technology based on science is evident. as a critical factor in social and economic change. As a result of these investigations in this study into the use of virtual reality in a variety of educational fields, positive results and empirical evidence for its potential applications in the classroom are encouraged. We encourage its continued use in the future.

6 References

[1] M. Halaweh, "Model of Emerging Technology Adoption(META): Virtual Reality as a Case Study," Journal of Information & Knowledge Management, pp. 1 -18, 2019. https://doi.org/10.1142/S0219649219500205

[2] N. H. Hussin, J. Jaafar and A. G. Downe, "Assessing educators' acceptance of Virtual Reality (VR) in the classroom using the Unified Theory of Acceptance and Use of Technology (UTAUT)," Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), pp. 216-225, 2011. https://doi.org/10.1007/978-3-642-25191-7_21

[3] E. Tzagkaraki, . S. Papadakis and M. Kalogiannakis, "Exploring the Use of Educa-tional Robotics in primary school and its possible place in the curricula.," in Education in & with Robotics to Foster 21st Century Skills. Proceedings of EDURO-BOTICS 2020, Online Conference February 25-26, 2021, 216-229, Switzerland, Cham: Springer., 2021. https://doi.org/10.1007/978-3-030-77022-8_19

[4] T. A. Alrawashdeh, M. I. Muhairat and S. M. Alqatawnah, ". Factors affecting acceptance of web-based training system: Using extended UTAUT and structural equation modeling," International Journal of Computer Science, Engineering and Information Technology (IJCSEIT), pp. 1205,1904, 2012. https://doi.org/10.5121/ijcseit.2012.2205

[5] K. Samaila, K. Abdulfattah and A. F. Amir, "Learning Management System Usage with Postgraduate School: An Application of UTAUT Model," International Journal of Education and Evaluation, pp. 38-49, 2017.

[6] M. Kalogiannakis, G. Nirgianaki and S. Papadakis, "Teaching magnetism to preschool children: The effectiveness of picture story reading," Early Childhood Education Journal, vol. 46, no. 5, pp. 535-546, 2018. https://doi.org/10.1007/s10643-017-0884-4

[7] R. M. R. A. B. b. A. A. R. &. A. R. A. S. Tawafak, "Assessing the Impact of Technology Learning and Assessment Method on Academic Performance.," Journal of Mathematics, Science and Technology Education, vol. 14, no. 6, p. 2241*, 2018. https://doi.org/10.29333/ejmste/87117

[8] R. M. Tawafak, A. B. R. Awanis and M. AlSinani, "E-learning system of UCOM for improving student assessment feedback in Oman higher education," Education and Information Technologies, vol. 1, no. 25, 2018. https://doi.org/10.1007/s10639-018-9833-0

[9] W. S. Alhalabi, "Virtual reality systems enhance students' achievements in engineering education," Behaviour & Information Technology, pp. 919-925,35,11, 2016. https://doi.org/10.1080/0144929X.2016.1212931

[10] N. Vidakis, A. K. Barianos, A. M. Trampas, S. Papadakis, M. Kalogiannakis and K. Vassilakis, "Generating Education in-Game Data: The Case of an Ancient Theatre Seri-ous Game," in Proceedings of the 11th International Conference on Computer Supported Education (CSEDU), 2019. https://doi.org/10.5220/0007810800360043

[11] T. H. Baek, C. Y. Yoo and S. Yoon, "Augment yourself through virtual mirror: the impact of self-viewing and narcissism on consumer responses," International Journal of Advertising, vol. 37, no. 3, pp. 421-439, 2018. https://doi.org/10.1080/02650487.2016.1244887

[12] D. Levac, "A knowledge translation intervention to enhance clinical application of a virtual reality system in stroke rehabilitation," BMC Health Services Research, pp. 1-11, 16, 2016. https://doi.org/10.1186/s12913-016-1807-6

[13] A. Pregowska, K. Masztalerz, M. Garlińska and M. Osial, "A Worldwide Jour-ney through Distance Education From the Post Office to Virtual, Augmented and Mixed Realities, and Education during the COVID-19 Pandemic," Education Sciences, vol. 11, no. 3, p. 118, 2021. https://doi.org/10.3390/educsci11030118

[14] G. ALFarsi, J. Jabbar and M. ALSinani, "Implementing a Mobile Application News Tool for Disseminating Messages and Events of AlBuraimi University College," International Journal of Interactive Mobile Technologies (iJIM), vol. 12, no. 7, 2018. https://doi.org/10.3991/ijim.v12i7.9484

[15] G. ALFARSI, K. A. M and M. ALSINANI, "A RULE-BASED SYSTEM FOR ADVISING UNDERGRADUATE STUDENTS," Journal of Theoretical and Applied Information Technology, vol. 95, no. 11, 2017.

[16] G. AlFarsi and M. ALSinani, "Developing a Mobile Notification System for AlBuraimi University College Students," International Journal of Information Technology and Language Studies(IJITLS), vol. 1, no. 1, 2017.

[17] U. Sekaran and R. Bougie, "Research methods for business: A skill building approach," john wiley & sons., 2016.

[18] N. Alalwan, L. Cheng, H. Al-Samarraie, R. Yousef, A. Alzahrani and S. M. Sarsam, "Challenges and prospects of virtual reality and augmented reality utilization among primary school teachers: A developing country perspective," Studies in Educational Evaluation, pp. Baabdullah, A. M., Alsulaimani, A. A., Allamnakhrah, A., Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2022). Usage of augmented reality (AR) and development of e-learning outcomes: An empirical evaluation of students'e-learning experience, 2020. https://doi.org/10.1016/j.stueduc.2020.100876

[19] X. Yang, L. Lin, P. Yu Cheng, X. Yang, Y. Ren and Y. Min Huang, "Examining creativity through a virtual reality support system," Education Tech Research Dev, pp. 1231-1254, 2018. https://doi.org/10.1007/s11423-018-9604-z
[20] A. S. Won, J. Bailey, J. Bailenson and C. Tataru, "Immersive virtual reality for pediatric pain. Children," Mind-Body Medicine in Children and Adolescents, pp. 4(7),52, 2017. https://doi.org/10.3390/children4070052
[21] W. Winn, "A conceptual basis for educational applications of virtual reality," Human Interface Technology Laboratory of the Washington Technology Center, Vols. 93-9, 1993.
[22] C. wen shen, J. tsung Ho, P. T. Minh Ly and T. chang kuo, "Behavioural intentions of using virtual reality in learning: perspectives of acceptance of informationn technology and learning style," Virtual Reality, spriger, 2018. https://doi.org/10.1007/s10055-018-0348-1
[23] M. Suomalainen, A. Q. Nilles and S. M. LaValle, "Virtual reality for robots," in International Conference on Intelligent Robots and Systems (IROS), 2020. https://doi.org/10.1109/IROS45743.2020.9341344
[24] C. W. Shen, J. tsung Ho, P. T. Minh Ly and T. chang kuo, "Behavioural intentions of using virtual reality in learning: perspectives of acceptance of informationn technology and learning style," Virtual Reality, spriger, 2018. https://doi.org/10.1007/s10055-018-0348-1
[25] C. W. Shen, J. T. Ho, T. H. Luong and T. C. Kuo, "Behavioral intention of using virtual reality in learning," in 26th International World Wide Web Conference, 2017. https://doi.org/10.1145/3041021.3054152
[26] C. G. Schin and D. Rusu, "Increasing Academic Brand Awareness through Virtual Reality," Management Comparat Internațional, pp. 171-182 , 18(2), 2017.
[27] G. Santamaría-Bonfil, M. Blanca Ibáñez, M. P. Ramírez, G. Arroyo-Figueroa and F. Martínez-Álva, "Learning analytics for student modeling in virtual reality training systems: Lineworkers case," Computers & Education, .elsevier, pp. 1-19, 2020. https://doi.org/10.1016/j.compedu.2020.103871
[28] S. M. Reeves, K. J. Crippen and E. D. McCray, "The varied experience of undergraduate students learning chemistry in virtual reality laboratories," Computers & Education, vol. 175, p. 104320., 2021. https://doi.org/10.1016/j.compedu.2021.104320
[29] H. Polina, H. Victor and O. Jivka , "Teaching Methodology for Virtual Reality Practical Course in Engineering Education," in International Conference on Virtual and Augmented Reality in Education, 2013.
[30] Peng Wang, Peng Wu, Jun Wang and Hung-Lin C, "A Critical Review of the Use of Virtual Reality in Construction Engineering Education and Training," International Journal of Environmental Research and Public Health, vol. 15, 2018. https://doi.org/10.3390/ijerph15061204
[31] V. S. Pantelidis, "Reasons to Use Virtual Reality in Education and Training Courses and a Model to Determine When to Use Virtual Reality," vol. 2, no. Special Issue, Pages 59-70, 2010.
[32] V. S. Pantelidis, "Virtual reality in the classroom," Educational Technology, vol. 33, no. 4, pp. 23-27, 1993.
[33] F. U. E. Moses Okechukwu Onyesolu, "Understanding Virtual Reality Technology: Advances and Applications," Advances in Computer Science and Engineering Source: InTech, pp. 53-70, 2011. https://doi.org/10.5772/15529
[34] Mehryar Nooriafshar, Ron Williams and Tek Narayan Marasen, "The use of virtual reality in education," in Seven Annual International Conference , Cairns,Astralia , 2004.
[35] S. Mandal, "Brief Introduction of Virtual Reality & its Challenges," International Journal of Scientific & Engineering Research, vol. 4, no. 4, pp. 304-309, 2013.

[36] S. M. C. Loureiro, . J. Guerreiro, S. Eloy, D. Langaro and P. Panchapakesan, "Understanding the use of Virtual Reality in Marketing: A text mining-based review," Business Research, pp. 100, 514-530, 2019. https://doi.org/10.1016/j.jbusres.2018.10.055

[37] S. M. C. Loureiro, J. Guerreiro, S. Eloy, D. Langaro and P. Panchapakesan, "Understanding the use of Virtual Reality in Marketing: A text mining-based review," Journal of Business Research, pp. 100, 514-530, 2019. https://doi.org/10.1016/j.jbusres.2018.10.055

[38] M. J. Kim, K. L. Choong and J. Timothy , "Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model," Journal of travel research, vol. 59, no. 1, pp. 69-89, 2020. https://doi.org/10.1177/0047287518818915

[39] S. Kavanagh, A. Luxton-Reilly, B. Wuensche and B. Plimmer, "A systematic review of virtual reality in education," Themes in Science and Technology Education, pp. 10(2), 85-119., 2017.

[40] D. Kamińska, T. Sapiński, N. Aitken, Della Rocc, M. Barańska and R. Wietsma, "Virtual reality as a new trend in mechanical and electrical engineering education. Open Physics,," Open Physics, vol. 15, no. 1, pp. 936-941, 2017. https://doi.org/10.1515/phys-2017-0114

[41] R. A. Junior and A. Bodzin, "immersive virtual reality design considerations to promote learning for English language learners," in International Conference of the Immersive Learning Research Network (iLRN), 2020. https://doi.org/10.23919/iLRN47897.2020.9155141

[42] H. R. Jung, W. P. Jin, S. N. Francis , T. J. Young, Y. O. Ah, J. L. Hak and H. K. Jin, "The Effect of Gamification through a Virtual Reality on Preoperative Anxiety in Pediatric Patients Undergoing General Anesthesia: A Prospective Randomized, and Controlled Trial," Journal of clinical medicine, pp. 1-8, 2018.

[43] N. Jeremy, Y. Nick, B. Jim, B. Andrew C, L. Nicole and J. Michael , "The Use of Immersive Virtual Reality in the Learning Sciences: Digital Transformations of Teachers, Students and Social Context," THE JOURNAL OF THE LEARNING SCIENCES, pp. 102-141, 2008. https://doi.org/10.1080/10508400701793141

[44] L. Jensen and F. Konradsen, "A review of the use of virtual reality head-mounted displays in education and training," Education and Information Technologies, pp. 23(4), 1515-1529, 2018. https://doi.org/10.1007/s10639-017-9676-0

[45] G. Fransson, J. Holmberg and C. Westelius, "The challenges of using head mounted virtual reality in K-12 schools from a teacher perspective.," Education and Information Technologies, vol. 25(4), no. 3, pp. 3383-3404., 2020. https://doi.org/10.1007/s10639-020-10119-1

[46] G. Fransson, J. Holmberg and C. Westelius, "The challenges of using head mounted virtual reality in K-12 schools from a teacher perspective," Education and Information Technologies, pp. 25(4), 3383-3404, 2020. https://doi.org/10.1007/s10639-020-10119-1

[47] H. Eva and B. Benedikt, "ESCAPING REALITY: EXAMINING THE ROLE OF PRESENCE AND ESCAPISM IN USER ADOPTION OF VIRTUAL REALITY GLASSES," in 25th European Conference on Information Systems, 2017.

[48] U. Erdem, U. Hakan, C. Turhan and U. llhan, "Effects of Using a force feedback haptic augmented simulation the attitudes of the gifted students towards studying chemical bonds in virtual reality environment," BEHAVIOUR & INFORMATION TECHNOLOGY, pp. 540-547, 2017. https://doi.org/10.1080/0144929X.2016.1264483

[49] H.-A. Elliot and L. Joey J, "Virtual Reality in education: a tool for learning in the experience age," Int. J. Innovation in Education, pp. 215-226, 2017. https://doi.org/10.1504/IJIIE.2017.10012691

[50] Z. Cao, J. Jerald and R. Kopper, "Visually-induced motion sickness reduction via static and dynamic rest frames," in IEEE conference on virtual reality and 3D user interfaces (VR), , 2018. https://doi.org/10.1109/VR.2018.8446210
[51] G. Baxter and T. Hainey, "Student perceptions of virtual reality use in higher education," Journal of Applied Research in Higher Education, 2019. https://doi.org/10.1108/JARHE-06-2018-0106
[52] S. F. Alfalah, "Perceptions toward adopting virtual reality as a teaching aid in information technology," Education and Information Technologies, pp. 2633-2653, 2018. https://doi.org/10.1007/s10639-018-9734-2
[53] R. Albert A., S. Maria and K. Kimberly A, "Analysis of assets for virtual reality applications in neuropsychology," NEUROPSYCHOLOGICAL REHABILITATION, pp. 14 (1/2), 207–239, 2004. https://doi.org/10.1080/09602010343000183
[54] A. Raman and Y. Don, "Preservice teachers' acceptance of learning management software: An application of the UTAUT2 model," International Education Studies, pp. 6(7), 157-164., 2013. https://doi.org/10.5539/ies.v6n7p157
[55] R. M. R. A. B. &. A. R. B. A. Tawafak, "Continued Intention to Use UCOM: Four Factors for Integrating with a Technology Acceptance Model to Moderate the Satisfaction of Learning," 2018.
[56] R. M. M. M. N. A. R. B. A. S. M. &. M. V. Tawafak, "1. Technology enhancement learning reflection on improving Students' Satisfaction in Omani Universities," Advanced Science Letters, vol. 24, no. 10, pp. 7751-7757, 2018. https://doi.org/10.1166/asl.2018.13012

7 Author

Ghaliya AlFarsi, She is working in AlBuraimi University College with experience of more than 15 years. Currently, she is a Ph.D. candidate in Malaysia. She published more than 50 papers between Scopus journals and peer-reviewed conferences.

Article submitted 2022-11-20. Resubmitted 2023-01-20. Final acceptance 2023-03-23. Final version published as submitted by the author.