

Use of Virtual Reality as Teaching and Learning Tool in Selected Private Secondary Schools in the Philippines

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Abstract

Virtual Reality (VR) is a modern teaching and learning tool which helped improve learners' knowledge and skills. However, its use in traditional teaching landscape becomes a recent discussion in the field of education where teachers and learners may not appreciate its value if they would only rarely experience its use as a learning tool. With this view, this study was conducted to describe and examine the use of virtual reality as a teaching and learning tool in the traditional teaching landscape. Utilizing mixed method design, the study gathered 150 randomly selected private secondary school teachers and 100 learners among selected private basic education institutions in the Philippines as respondents. Results showed that teachers and learners found the use of VR as an effective tool specially in teaching and learning the instructional contents of the subjects. The use of VR was also found relevant to cater with the learning needs of learners in the form of providing substantial experiences even without leaving the class. In addition, VR helped teachers provide more engaging and active interactions during instructional process. Meanwhile, there was a significant difference when responses are grouped according to the responses of teachers and learners. Teachers found the use of VRs as an effective tool for the delivery of instruction, providing relevant approaches in the teaching and learning process and helped them established engaging and active instructional environment. Challenges encountered by teachers and learners on the use of VR were expensive and highly technological.

Keywords: virtual reality, teachers, learners, teaching landscape, teaching tool, learning tool, instructional content



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INTRODUCTION

The prevalence of highly advanced technology in all sectors of society is evident as individuals today utilize technology, including modern devices, gadgets and applications for common purposes. One of the apparent uses of technological advancements is for educational purpose where technological devices and applications are integrated in the teaching and learning process. In the realm of modern teaching and learning, within the technological landscape, teaching and learning process becomes more advanced as teachers and learners use diverse types of devices, gadgets and application which help them create effective instructional process. One of these technologies is virtual reality (VR). Commonly, VR is utilized to create highly interactive classroom amidst the traditional practices of teachers in the teaching and learning process.

Virtual Reality (VR), a modern tool in the teaching and learning process and widely used to effect immersive learning experiences, contains features that allow learners to experience actual conditions, situations or events by means of using other devices such as smart televisions and computers. Teachers use VR for the purpose of instituting learners' actual experiences. The introduction of VR in the Philippines has revolutionized the education system as students experienced exciting virtual simulations and interactive experiences, going beyond the constraints of traditional teaching approaches. By incorporating VR, learning becomes more engaging and bridges the gap between theoretical knowledge and real-world applications (Kumar, 2023). With this, they can be able to experience the content of the topics under a certain subject with immense direct encounter through technological features.

Virtual reality is a modern application and tool which creates an entire digital environment. Thus, virtual reality demonstrates a 360-degree immersive user experience that feels real (American University, 2020). In addition, virtual reality encourages learners to interact with what they see as if subjects are really there. In this line, virtual reality provides immersive experiences for the learners where they can actually see objects and conditions in real forms and shapes through the graphical contents presented by technological applications and software. The use of virtual reality in a normal classroom setting help learners to feel actual situations depicting the topics under the subject matter. Virtual reality increases the learning experiences of learners as they are provided with proper intervention to increase their memorization and visualization exercises leading to the comprehensive understanding and increasing the interest and engagement (Tan & Waugh, 2013). In addition, virtual reality offers learners experience they might not have with other learning tools which include reality-based experiences and immersive exposure (Cooper et al., 2019). Perceptions in the use of virtual reality emphasize all dimensions for effective learning which significantly include social influence to learning, facilitating conditions to real-based learning experiences and develop interactions among learners (Bower et al., 2020). Virtual reality practices help learners increased their interest in learning, developed their creativity, allowed them to take virtual trips, increased motivation, and developed technological literacy (Yildirim et al., 2020).

While virtual reality serves as modern learning tool in the teaching and learning process, its value and significance may only be practical and effective in a highly digitalized and modernized classroom settings. As the researcher observed, use of virtual reality in traditional teaching landscape becomes a recent discussion in the field of education where teachers and learners may not appreciate its value if they would only rarely experience its use as a learning tool. The escalation in the use of virtual reality in the traditional teaching environment serve as supplementary learning

tool that becomes a substantial element to increase learners cognitive and psychomotor skills (di Lanzo et al., 2020). As observed by the researcher in the traditional teaching set-up, teachers and learners commonly diverted into lectures, discussions and other types of activities in the learning process which less emphasize the value of creation of meaning and knowledge through traditional teaching and learning tools. In this line, this study described and examined the use of virtual reality as a teaching and learning tool in the traditional teaching landscape.

Statement of the Problem. This study described and examined the use of virtual reality as teaching and learning tool in the traditional teaching landscape among selected private schools in the Philippines. Specifically, it answered the following questions:

1. How may the use of virtual reality as a teaching and learning tool in traditional teaching landscape be described by teachers and learners in terms of:
 - 1.1 instructional content;
 - 1.2 relevance;
 - 1.3 interaction and engagement; and,
 - 1.4 assessment?
2. Is there a significant difference in the use of virtual reality when responses are grouped according to teachers and learners?
3. What are the challenges encountered by the respondents in using virtual reality in the traditional teaching landscape?

METHODS

The study utilized mixed method design in order to describe and examine the use of virtual reality in the traditional teaching landscape among the selected private schools in the Philippines. The quantitative aspects of the study fall from the use of virtual reality as a teaching and learning tools in terms of instructional content, relevance, interaction and engagement and assessment as well as in determining if significant difference in the use of virtual reality in the traditional teaching

landscape exist when respondents are grouped as teachers and learners. Meanwhile, the qualitative aspect emphasized the challenges encountered by the respondents in using virtual reality as a teaching and learning platform.

There were two (2) research instruments used in the study. A researcher-made survey-questionnaire, with 4-point Likert scale served as the main instrument of the study while guide questions served as the secondary instrument. The developed survey-questionnaire was validated by experts in the field of education and subjected to reliability testing. The same obtained a Cronbach alpha result of .845 which signified that the instrument was **reliable**. Meanwhile, guide questions for the qualitative aspect of the study were arranged inductively and were validated by experts in the field of education.

The study selected the participation of 150 private secondary school teachers and 100 learners from the Philippines who were randomly chosen. Selection of the teacher-respondents was based on the following: 1) currently employed as full-time basic education teachers; 2) implemented the use of VRs in their teaching process; and, 3) attended seminars and trainings in the use of VRs. On the other hand, student-respondents were selected based on the following: 1) those who have experienced using VRs as their learning tool; and, 2) those who were exposed in VR technologies as used by their teachers and/or provided by their schools.

In gathering the quantitative data, a letter of request was sent to the school administrators of the selected private schools. Upon receipt of their approval, actual administration of the survey-questionnaire followed. An informed consent and short orientation were provided. On the other hand, in gathering the qualitative aspect of the study, the researcher selected the participation of ten (10) teachers and (10) learners. Focus-group discussions (FGDs) were conducted in order to solicit narrative responses relating to the challenges they encountered in the use of virtual reality as a teaching and learning tool in the traditional

teaching landscape. Hence, qualitative responses were encoded and transcribed.

Mean and general weighted mean were used in order to describe teachers and learners' practice on the use of virtual realities. In addition, regression analysis was used in order to examine if there would be a significant difference in the use of virtual reality when responses are grouped according to teachers and learners.

Further, thematic analysis was used in order to determine the challenges encountered by teachers and learners in the use of virtual reality in instructional process. The results on the qualitative analysis extracted the challenges encountered by teachers and learners as they use virtual reality in instructional process.

RESULTS AND DISCUSSION

Use of Virtual Reality as a Teaching and Learning Tool as Described by Private School Teachers and Learners. As shown in Table 1, the overall mean of 3.69 implies that teachers strongly agree that VR provides immersive experiences and simplifies complex concepts. This reveals that the VR is viewed by teachers as an effective tool for enhancing instructional content. On the other hand, the use of virtual reality in terms of relevance obtained an overall mean of 3.70 which is verbally described as "Strongly Agree." This implies that the relevance of VR directly responds to learners' needs. Teachers viewed that the use of VR as a teaching and learning tool effectively fill the gaps between application of theoretical knowledge to real life contexts whereas learners are also provided with real-life exposure though without leaving their class. In this regard, teachers also treat the use of VR as a substantial teaching and learning platform that emphasize novelty in the spheres of modern education. Lastly, in terms of interaction and engagement, VR obtained overall mean of 3.71 ("Strongly Agree") indicating that this technology enhances student interaction and collaboration and increases learner engagement. With the use of

VR learners are highly engaged and motivated to learn as they are directly exposed to virtual realities where they can practically apply their acquired learning.

Table 1
Mean Distribution on the use of virtual reality as a teaching and learning tool as described by private school teachers

Items	wm	Verbal description
Instructional Content		
1.VR provides immersive experience	3.67	Strongly Agree
2.VR simplified complex concepts	3.82	Strongly Agree
3.VR support the relevant attainment of learning goals	3.61	Strongly Agree
4.VR provides access to resources and environment	3.74	Strongly Agree
5.VR delivered more engaging instructional content	3.63	Strongly Agree
Overall Mean	3.69	Strongly Agree
Relevance		
1.Integration of VR in teaching address the relevant needs of the learners	3.62	Strongly Agree
2.VR tools bridge gap between theoretical knowledge and practical application	3.73	Strongly Agree
3.Use of VR in the class prepare learners for future technological advancements	3.65	Strongly Agree
4.VR experiences are highly relevant to real-world scenarios	3.83	Strongly Agree
5.Use of VR in education reflects nature of technology and relevant learning	3.71	Strongly Agree
Overall Mean	3.70	Strongly Agree
Interaction and Engagement		
1.VR increases student interaction and collaboration	3.71	Strongly Agree
2.Learners are engaged and motivated to learn	3.82	Strongly Agree
3.VR facilitates hands-on learning experiences enhancing learners' participation	3.56	Strongly Agree
4.Interactive nature of VR encourages learners to take active roles in learning	3.63	Strongly Agree
5.VR create more stimulating learning environment	3.84	Strongly Agree
Overall Mean	3.71	Strongly Agree

Legend: 4.00-3.25-Strongly Agree (SA), 3.24-2.50-Agree (A), 2.49-1.50-Disagree (D), 1.00-1.75-Strongly Disagree (SDA)

The use of VR emphasizes a stronger creation of meaningful learning experiences as a way to transform knowledge on a practical platform. Strong agreement of teachers with the use of VR in terms of instructional content, relevance and interaction and engagement shows that teachers and learners effectively create meaning that lead to retentive learning experiences. This is supported by the study of Fitria (2023) which reveals that VR as a modern technological tool help learners understand the realities outside the class as they formally apply their gained knowledge including principles, theories and concepts effectively.

In Table 2, an overall mean of 3.49 ("Strongly Agree.") was yielded. This shows that learners strongly agree that VR supports the attainment of their learning goals and effectively facilitates easy access to resources. Thus, the result

shows that learners find VR not only as educational tool but also a medium that increases their motivation and engagement on the basis that learners are also highly inclined with technological devices and applications. On the other hand, the use of VR as described by learners in terms of relevance obtained an overall mean of 3.68 ("Strongly Agree."). This implies that learners expressed their strong agreement that they have learned effectively when VR is utilized in the teaching and learning process.

Table 2
Mean distribution on the use of virtual reality as a teaching and learning tool as described by private school learners

Items	wm	Verbal description
Instructional Content		
1.VR provides immersive experience	3.56	Strongly Agree
2.VR simplified complex concepts	3.27	Strongly Agree
3.VR support the relevant attainment of learning goals	3.45	Strongly Agree
4.VR provides access to resources and environment easily	3.57	Strongly Agree
5.VR delivered more engaging activities	3.63	Strongly Agree
Overall Mean	3.49	Strongly Agree
Relevance		
1.Integration of VR helps us understand the concept easily	3.67	Strongly Agree
2.VR allows us to practically apply our learnings	3.71	Strongly Agree
3.Use of VR prepare us for the real-world context	3.82	Strongly Agree
4.VR responds to our needs and interests for learning	3.63	Strongly Agree
5.VR provides more relevant activities	3.61	Strongly Agree
Overall Mean	3.68	Strongly Agree
Interaction and Engagement		
1.VR develops our active participation	3.69	Strongly Agree
2.VR directly engaged us in actual learning	3.67	Strongly Agree
3.VR facilitates hands-on learning experiences	3.71	Strongly Agree
4.VR provides interactive activities	3.73	Strongly Agree
5.VR poses creative activities that enable us think critically	3.73	Strongly Agree
Overall Mean	3.70	Strongly Agree

Legend: 4.00-3.25-Strongly Agree (SA), 3.24-2.50-Agree (A), 2.49-1.50-Disagree (D), 1.00-1.75-Strongly Disagree (SDA)

In addition, the result shows that learners view VR as an aid and highly effective learning tool that prepare them for the real-world contexts considering the practical application of knowledge along with their practical skills. Lastly, in terms of interaction and engagement, VR obtained an overall mean of 3.70 ("Strongly Agree") suggesting that the learners perceived VR as an efficient tool to promote active participation and offer hands-on learning experiences. In addition, learners express that in the use of VR, they learn concepts while emphasizing the development of higher order of thinking skills.

The use of VR is perceived as a valuable teaching and learning tool that enable learners to create and establish understanding to the real-world context because they are provided with real-based activities. The development of their knowledge and skills are brought by their strong exposure to real-world situations provided by the VR. The efficiency and proper utilization of VR directly attracts learners to engage in meaningful learning experiences. The findings are affirmed by the study of Walker (2022) which concludes that VR-based environment represents real-life situations and allow learners to be trained and test their skills relevant to real-world context. On the other hand, virtual reality exists in many forms which has been used for more than decades already. The spread of affordable virtual reality technology affected the vast majority of the population ranging from education and work to entertainment leisure. Thus, the study also concludes that exposure of the learners to this technological advancement in the education system prepared them to use productively outside their conventional learning conditions. Hence, this tool creates more practical and retentive learning experiences for teachers and learners.

Difference in the use of virtual reality when responses are grouped according to teachers and learners. Based on Table 3, in terms of instructional content, the t-statistic (9.01) indicates a significant difference between the means of teachers and learners which implies that teachers perceive the practical and effective use of VR in terms of instructional content. In addition, the result implies that teachers see the use of VR more positively about the instructional quality, content and the applicability of instructional settings.

Table 3
Difference in the use of virtual reality when responses are grouped according to teachers and learners

Category	Mean (Teachers)	Mean (Learners)	Mean Difference	t-Statistic	Degrees of Freedom
Instructional Content	3.69	3.49	0.20	9.01	248
Relevance	3.70	3.68	0.02	0.90	248
Interaction and Engagement	3.71	3.70	0.01	0.45	248

On the other hand, in terms of relevance and interaction and engagement, both groups obtained a consensus on the significance of VR in the applicability and effectiveness of the tool in the teaching and learning process. Although virtual reality can improve learners' knowledge and skills more efficiently, learners and teachers experienced fun and exciting learning. Hence, novel pedagogical form is being introduced with the use of virtual reality in the teaching and learning process (Irons, 2023). Virtual reality as teaching aid help teachers and learners develop their knowledge and skills which highly facilitate real-world based situations and activities (Alfalah, 2018).

Challenges Encountered by the Respondents in Using Virtual Reality in the Traditional Teaching Landscape. Table 4 presents the themes and sub-themes formed from the qualitative data. Based from the teachers' accounts, acquisition of VR is found to be expensive which hampers the strong adoption of virtual reality in educational settings. As shared by teachers, the school finds it difficult to acquire and maintain the use of VR in instructional process consistently. Hence, the economic value of VR requires sufficient amount of funding which commonly prevent institutions to consistently use it.

Table 4
Major themes and sub-themes relative to the challenges encountered by teachers and learners in the use of virtual reality

Major Themes	Subthemes
Expensive	- Financial constraints in purchasing the application - Usage requires highly technical skills in technological operations
Highly Technological	Difficulty in activating navigation tools

Further, since VR is costly expensive, there is an obvious inequality to access its use on the basis that only learners who can afford in purchasing the application and the device can use the same in the teaching and learning process while those who cannot afford hardly use and access its application. Meanwhile, VR demonstrates highly technical skills where

teachers and learners find it difficult to navigate its settings before they can properly use the device. With an apparent difficulty on the use of VR's navigation tools and requires highly technical skills to operate it, teachers and learners experience disengagement. While VR can improve learners' academic performance, teachers encountered challenges like availability of equipment and trained staff in using the device. This creates strong hindrance to effectively use VR in the teaching and learning process (Alalwan et al., 2020).

Conclusion. Virtual Reality is a modern teaching and learning tool which helped improve learners' knowledge and skills. Teachers and learners found the use of VR as an effective tool specially in teaching and learning instructional content of the subjects. The use of VR was found relevant to cater with the learning needs of learners in the form of providing substantial experiences even without leaving the class. In addition, VR helped teachers provide more engaging and active interactions during instructional process.

Meanwhile, there was a significant difference when responses are grouped according to the responses of teachers and learners. Teachers found the use of VRs as an effective tool for the delivery of instruction, providing relevant approaches and process in teaching and learning process and helped them establish engaging and active instructional environment. Challenges encountered by teachers and learners on the use of VR were expensive and highly technological.

Recommendation. The use of VR should be integrated in the teaching and learning process consistently. Though a bit expensive in terms of price, school administrators are encouraged to support the acquisition and use of VR for use in their respective schools. In addition, VR should be communicated with parents so that they would be able to understand its advantageous effects on their children's learning process. Meanwhile, teachers should attend trainings and workshops as to the proper use of VR in the teaching and learning process.

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