I Wayan Eka Dian Rahmanu – Lokman Altun

Spherical video-based virtual reality (svvr) study: 360°-video implementation in English learning materials at polytechnic education

Introduction

The combination of multimodal, including audio-visuals, text, and internet technology, is suitable for adult learners (Rahmanu et al., 2020). The specific type of audio-visual employed for education nowadays is 360°-degree video, and this tool is usually designed to improve learners' particular abilities. Dalgarno and Lee summarize five learning benefits (Dalgarno & Lee, 2010):

- Spatial knowledge representation involves the contents that require spatial understanding and can benefit from three-dimensional visualizations in the virtual learning environment (VLEs). This tool also leads the experiential learning, which means learning through experimenting with and experiencing 3D-VLEs provides a better understanding of the subject matter. Engagement is another benefit that includes learning tasks in 3D VLEs, which can foster intrinsic motivation and engagement with the learning content.
- Contextual learning follows a constructivist view, and learning is always situated within a broader context.
- Three-dimensional learning environments resemble real-life situations in which the learning contents can be applied.

The last advantage is collaborative learning, which provides environments where learning can happen through collaboration and social interaction.

With regards to the synchronous and asynchronous learning in teacher education, developing spherical video was another brilliant option to scaffold professional learning in teacher education. These virtual experiences are significant equipment to elevate the professional however the facilitator's support must assist it. The 360° video seems to us to be a tool to generate skills and comprehension in education (Roche & Rolland, 2020). Related to this area, to develop a full picture, future studies of VR goggles should consider investigating the perception of ESP students and the factors influencing their perception. Besides, with the lack of rich ESP virtual videos and difficulties finding some related to Psychology, Child development, and Counselling content, more ESP 3D videos and guidance are required to enhance the use of VR headsets. (Madini & Alshaikhi, 2017). Similarly, another ESP area that should be underpinned by this tool is the Polytechnic education system.

Literature Review

English Learning Materials

Learning materials are applied to assist the learners in gaining the knowledge given by the teachers. English learning materials should be prepared to underpin the process of transferring the comprehension to the students. This potentially escalates learners' English language skills, including writing, reading, listening, and speaking ability. The teachers must prepare the English learning tools to espouse the English language teaching in the classroom. The goal of English language teaching is to make students communicate using the target language, in this case, English (Sukarno, 2012). In other words, the learning media is essential for the teachers and learners to evoke the learning objective. The systematic and appropriate learning media can improve the students' ability to learn English.

Video-360°

Some experts indicated that this medium is applied for many different purposes. This tool is used for destinations and tourism businesses field, and the results show that 360° videos increased positive feelings and willingness to travel regardless of watching with a tablet or VR glasses (Pasanen et al., 2019). This means that the tool is aimed to urge people to organize the trip; the customer is provided with the visual environment using 360°-videos. Similarly, the benefits of spherical video utilization to end-users include seeing eye contact between all the interlocutors acting in the video clips and getting to know about professional mannerisms, including how to interrupt during formal discussions from looking at the whole situation in the meeting room. The students can comprehend the importance of bodily gestures and facial expressions during professional communication, leading to their ability to communicate more effectively and professionally in the workplace as the experience of watching 360° or spherical videos is similar to the actual situation (Adnan, Ahmad, Yusof, et al., 2019). The advantage of this strategy is that the students can significantly absorb essential knowledge of the business environment before facing a real situation. The 360° videos were immersed in the four-year medical program. This fulfills the project's main objective, verifying that the immersive experience facilitates the teaching-learning experience by effectively removing the barrier between the student, the lecturer, and the machine. Most students felt spatially present in the surgery room, thus perceiving the scene as if they were there at the moment of the surgical intervention (Guervós et al., 2019). Involving spherical video based on medical education, the learners have presented the virtual medical sphere, which will actively enhance learners' understanding. The spherical video-based technology was also employed in the construction field, aiming for mobile safety education. The researcher generated Virtual Field Trip System (VIFITS) system, which provided an interactive learning environment for bringing construction field trips to the classroom to improve students' practical experience and safety knowledge. Preliminary results reveal that VIFITS was a powerful pedagogical method for effectively providing students practical experience and safety knowledge and improving construction safety education (Pham et al., 2018). It can, therefore, be assumed that the virtual field trip system leads to a sophisticated impression for the users. A clear learning objective will certainly be gained by generating the learners' urge to learn the subject. Creating interactive educational content is paramount to grabbing the attention of today's learners, whose attention span is easily dissolved into thin air. If we keep forcing them to learn using the traditional style such as teacher-led 'chalk-and-talk', reading from dry textbooks, and keeping teachers as the center of the class, we are doing these undergraduates a disservice in the long run. Grabbing learners' attention will result in authentic learning and knowledge acquisition (Adnan, Ahmad, Mohd Kamal, et al., 2019). One of the interactive learning tools is 360°-video or spherical video-based virtual reality, which shifts students' behavior towards the face-to-face and remote learning system.

Spherical Video-Based Virtual Reality (SVVR)

VR is a new media technology that provides three-dimensional (3D) simulations of natural scenes or recordings of real environments. VR technology can create artificial sensory experiences, involving individuals at an emotional and attentional level and allowing real-time interaction (Jung & Dieck, 2018). Moreover, it has an interactive and spherical presentation that makes the experiencers feel as if they are in a natural scene (Wu et al., 2021) and (Chien et al., 2020). VR can be categorized into three parts based on previous research:

- desktop VR (low-immersive VR desktop environments), which creates use of computer 3D modeling to generate a 3D landscape, and which users can view and experience through a computer and smartphone;
- cave-based VR, which provides a panoramic sensory experience in a confined space;
- and the fully immersive VR system, which achieves immersion through VR equipment (Wu et al., 2021), (Chien et al., 2020), (Portman et al., 2015), and (Smith, 2015).

The vast development of VR technology has also resulted in significant possibilities for classroom teaching.

The lack of technology immersion in the learning materials leads the learners unavailable to follow the lesson properly in the State Polytechnic of Bali. The tendency of the students nowadays is to have a different learning experience, and this can be discovered in many learning sources. In addition, the learning tools are still prepared for traditional techniques, such as PowerPoint, slides, and conventional video, potentially decreasing learners' eagerness to learn the lesson. Based on the gap discovered, this research concerns on Spherical Video-Based Virtual Reality (SVVR) study: 360°-Video Implementation in English Learning Materials at Polytechnic Education. This paper presents preliminary results of a case study in generating the 360°-degree video for the English learning material in the business education department.

- What is the students' perception of the use of Spherical Video-Based Virtual Reality (SVVR) used in the State Polytechnic of Bali?
- Is there any performance expectancy (PE) on the Spherical Video-Based Virtual Reality (SVVR) used in the State Polytechnic of Bali?
- Is there any effort expectancy (EE) on using Spherical Video-Based Virtual Reality (SVVR) in the State Polytechnic of Bali?

Method

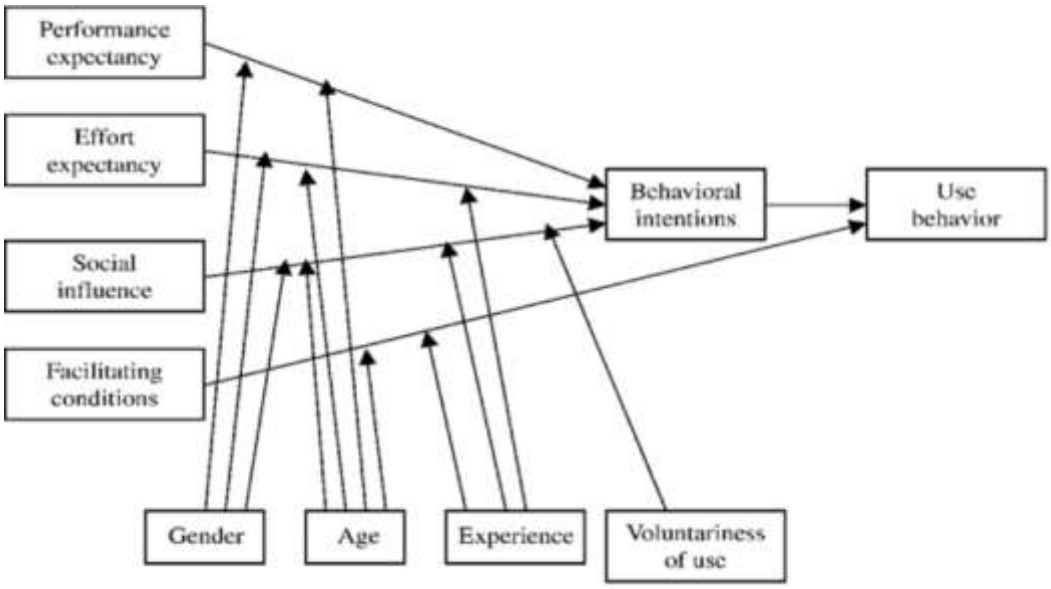
Participants

According to the study, 169 State Polytechnic of Bali adult learners who learned the English language in the Business Administration Department were involved in providing perception on the SVVR 360°-video. The age range of participants was from 18-20. They were in the second semester and obtained the English lesson at the State Polytechnic of Bali. The Indonesian language was the learners' first language; all of them had a smartphone for study. All participants had participated in the study voluntarily.

Data Collection

The concept of the unified theory of acceptance and use of technology (UTAUT) (Vankatesh, 2016) was applied to collect the data process. The use of UTAUT theory assists this research in evaluating the spherical video-based virtual reality benefit for the learners in the Business Administration program. The theory consists of performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), behavioral intension (BI), and use behavior (UB). Performance expectancy (PE) measures the properness and usefulness of the device. This also means the degree to which an individual believes that technology conduces learners or users to gain knowledge in the learning process, while effort expectancy (EE) evaluates the simplicity of technology use, stress-free interaction, and importance of use. Social influence (SI) involves the usefulness for the users whereas facilitating conditions, whereas facilitating conditions (FC) evaluate the availability of the system and knowledge to operate the system (Venkatesh et al., 2016). This study focused on measuring performance expectancy (PE) on the positive impact and the usefulness of the device and effort expectancy (EE) on ease of technology use and importance of use for Bali State Polytechnic students who learn English in the Business Administration department.

Figure 1. UTAUT (unified theory of acceptance and use of technology)



(Venkatesh, 2016)

For quantitative data, The digital questionnaire was deployed as the instrument to receive the participants' data based on 5-point Likert Scale, ranging from 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree. The questionnaire items consisted of five topics concerned with the trend of multimodality in English instruction.

Data Analysis

The researchers developed the questionnaire items based on the *unified theory of acceptance and use of technology* (UTAUT). After development, factor analysis was applied to this questionnaire by conducting a pilot study (Table 1).

Table 1.: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			,909
Bartlett's Test of Sphericity		Approx. Chi-Square	1151,725
		df	45
		Sig.	,000

Based on KMO and Bartlett's Test results, the questionnaire was found ready to analyze the data set, and a significant result was found. 2 factors specified in this research were clarified according to the total variance results (*Table 2*). The variance result was found as 71,875, which is highly acceptable.

Table 2.: Total variance results

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6,034	60,338	60,338	6,034	60,338	60,338	5,238	52,378	52,378
2	1,067	10,668	71,006	1,067	10,668	71,006	1,863	18,628	71,006
3	,623	6,232	77,238						
4	,512	5,116	82,354						
5	,493	4,926	87,280						
6	,328	3,278	90,558						
7	,316	3,163	93,721						
8	,270	2,705	96,426						
9	,206	2,055	98,481						
10	,152	1,519	100,000						

Extraction Method: Principal Component Analysis.

After that, the researchers clarified whether the items were analyzing these two factors or not by searching the matrix table after factor analysis. One item was excluded as it did not serve the target factor in the study (*Table 3*), and a total of 9 items were conducted for the target participants of this study.

Table 3.: Component Matrix

	Component	
	1	2
VAR00001	,849	-,175
VAR00002	,866	-,135
VAR00003	,826	-,172
VAR00004	,853	-,103
VAR00005	,573	,640
VAR00006	,804	-,038
VAR00007	,779	-,155
VAR00008	,810	-,117
VAR00009	,804	-,003
VAR00010	,519	,728

After the factor analysis process, the reliability of the final questionnaire was found (*Table 4*). Using SPSS, descriptive statistics of the questionnaire were calculated to answer the research questions.

Table 4.: Reliability Statistics

Cronbach's Alpha	N of Items
,925	9

Procedures

The main scene of the video-360° was divided into 5 parts: introduction, audio-visual room, meeting room, office lab, and computer lab, which were explicitly elaborated. The speaker elucidated every part of the scene using the English language. The 360° camera was used to record the activities and was put 1,5 meters from the speaker. In addition, a tripod also was installed to put the camera properly. By setting the smartphone into the VR view, the picture will be split into two parts, but the extra tool was demanded to enjoy the environment virtually. In this research, the option of using VR was not chosen to simplify the process of English language instruction. Instead, this study applied Spherical Video-Based Virtual Reality (SVVR) to compact the classroom activities because the learners could use their hands to move the devices safely.

Figure 2.: Introduction

In the introduction scene, the presenter of the video introduced the departments available at the Polytechnic State of Bali, and the speaker explained the 6 departments, including Business Administration, Tourism, Engineering, Electro Engineering, Accountancy, and Civil Engineering. The text and logo of the Polytechnic State of Bali were added and placed beside the speaker. The setting was in front of the Administration building, close to the Tourism and Accountancy building departments. The research elaborated and explained the Business Administration Department building.

Figure 3.: Audio-visual room

In the audio-visual room, the viewers were referred to some green chairs, whiteboard projectors, a red floor, speakers, and a table. The speaker elaborated on the room generally to provide a chance for the learners to understand this scene. The camera is set approximately 2 meters from the speakers; as a result, the students saw the view widely. In the end session of this scene, the learners were allowed to analyze the room and provided 3 questions that should be responded to accurately. This occasion was beneficial for students to discuss and answer the questions with their classmates, enriching their idea, vocabulary, and understanding of the audio-visual room.

Figure 4.: Meeting room

The learners had a chance to see the meeting room's environment; specifically, this room's situation proposed learners' knowledge and vocabularies, especially in the business meeting room. The viewers noticed several tools related to the meeting room in this area, for example, cabinet, folder, chairs, long table, board, projector, speaker, and internet connection. In this part, the presenter explained the room's function and allowed the learners to observe the environment by moving the device or sweeping the smartphone screen. Subsequently, the questions (about what?) were displayed on the whiteboard to let the students answer and analyze a particular part of the area.

Figure 5.: Office lab

On the second floor of the building, the Business Department provides an office lab and can be applied by the lecturers to practice the business lesson. In the scene of this 360°-video, the viewers were

guided by the presenter to reach the room. Before entering the office lab, the learners would see the lecturers' office, department office, administration office, lobby, and server room. This room is situated near to computer lab and server room. The students could observe various office tools, for example, books, files, cabinets, computers, printers, copy machines, tables, telephones, and chairs. These types of equipment underpin learners' activity in practicing the administration responsible. The presenter must explain the room analysis because the students intended to answer and respond to the question provided at the end of the session.

Figure 6.: Computer lab

Another room on the second floor introduced by the speaker was the computer lab, and the students commonly use this area to conduct the keyboarding skill, media technology, digital business, and mailing system. In this part, the presenter opened the door and started explaining the computer lab's function. After that, the speaker provides several times for the students to analyze the room. A computer system, including monitors and CPU, is dominated, and the viewers must focus on these items because, in the last session, the questions about the total number of computers were deployed. At the end of the scene, the presenter provoked the learners to practice English through this application as this can be applied for General English lessons and English for specific purposes, especially in the Digital Business Program.

Result

A. The Students Perceptions on the SVVR 360˚-video

To answer the first research question (RQ), frequency of students' responses was clarified and, it was believed that Spherical Video-Based Virtual Reality (SVVR) 360º-Video had a positive impact on the teaching and learning process in the classroom. From 169 responses, it was seen that the users tend to agree to utilize this tool in escalating the urge in learning English. The simplicity of this learning kit was another consideration for learners to use during the instruction.

Table 5.: Students Perception on the SVVR 360°-Degree

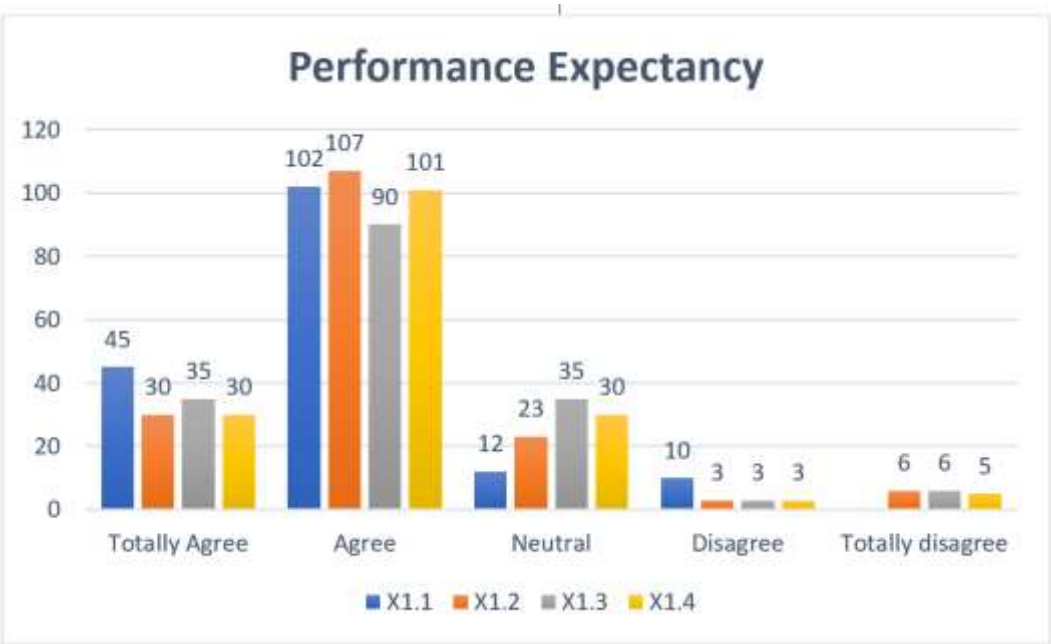
		X1.1	X1.2	X1.3	X1.4	X1.6	X1.7	X1.8	X1.9	X1.10	Total_X1
N	Valid	169	169	169	169	169	169	169	169	169	169
	Missing	0	0	0	0	0	0	0	0	0	0
Mean		4.08	3.90	3.86	3.88	3.66	3.83	3.75	3.69	3.48	37.80
Median		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	39.00
Mode		4	4	4	4	4	4	4	4	3	40
Std. Deviation		.756	.836	.888	.825	.793	.737	.772	.839	.839	6.280
Sum		689	659	652	655	619	648	633	623	588	6389

According to the performance expectancy (PE), the data on X1.1 showed a positive experience using the SVVR. Based on the data, the mean = 4.08, median = 4.00, and mode = 4 indicated that the learners tended to agree that using SVVR in studying English provided a new experience. Item X1.2 represented the learners' arguments on the influence of SVVR in increasing the desire to learn English. The data mentioned the mean = 3.90, median = 4.00, and mode = 4; in other words, this medium evoked learners' urge to learn English. Similarly, item X1.3 explained the role of SVVR in assisting the students in learning English during the instruction. The mean = 3.86, median = 4.00, and mode = 4 implied the students' belief in the benefit of this contemporary medium in absorbing English knowledge. Finally, the item on X1.4 described a new learning method employing SVVR for the English lesson. The result of mean = 3.88, median = 4.00, and mode = 4 indicated the exciting video provided by SVVR through the teaching and learning process.

On the other hand, there were 5 questions based on the effort expectancy (EE) employed in this research. The question on X1.6 referred to the simplicity of SVVR use. based on table 1, the mean of this question was 3.66, while the median and mode were 4. The learners believed that this medium was conveniently applied through teaching and learning. Related to the data on X1.7, the question was about the compatibility of this tool with the learners' smartphones. The result of the data on the mean was 3.83, whereas the score of median and mode were 4. The tendency of students to use a smartphone during the teaching and learning process could be seen saliently. The learners agreed to employ smartphones specifically in operating the SVVR 360°-video. The data on X1.8 elaborated the easy access to the video for the English lesson. According to the data, the mean score was 3.75, while the result of median and mode were 4. It could be elaborated that most of the students agreed on the simplicity of SVVR video use. The students have a different experience as the device could be moved to watch the environment on the video. This was underpinned by the data on X1.9 that explain the chance of users to move the device or smartphone to watch the sphere. In the data, the mean score was 3.69, and the median and mode scores were similar at 4. It means the learners are assured that this medium brings a new impression to learning English. Based on the students' argument on the video quality, it is interesting for the writer to understand that the resolution of the video was not equitable when the learners faced a low internet connection. The result for the question on X1.10 represented the fear of the internet trouble when operating the SVVR video in the teaching and learning instruction. The recommendation to run the program smoothly was in the higher resolution, which is sometimes difficult for several students to organize.

B. The performance expectancy (PE) on the Spherical Video-Based Virtual Reality (SVVR) used in the State Polytechnic of Bali

Table 6.: Students perception on the Spherical Video-Based Virtual Reality (SVVR)

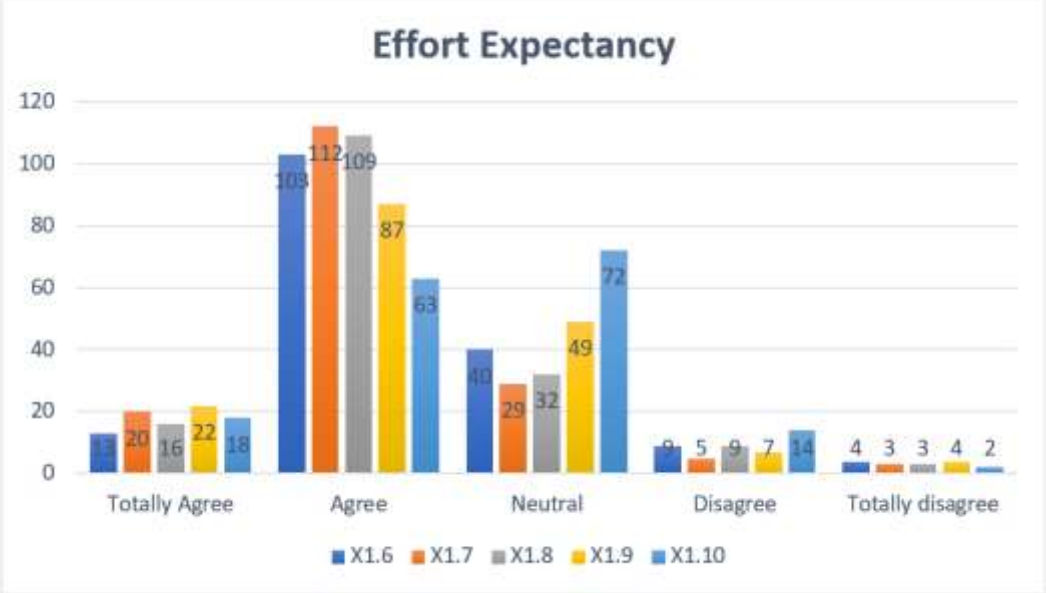


RQ2 aspires to the performance expectancy (PE) side of SVVR. In terms of the learners' opinion on the Spherical Video-based Virtual Reality (SVVR) use in the language instructional in the Polytechnic education system, the students believe that this medium positively impacts the learning process. This is in line with PE in UTAUT theory which measures the users' satisfaction. Offering a positive experience is the benefit of using this media as a learning kit. The lecturers can instruct the learners to watch the video directly using the smartphone or additional equipment, namely a VR tool. However, the users are recommended to wear the VR tool for the appropriate time, for example, 10-15 minutes, to avoid the inappropriate effect of the VR tool use. Unlike VR learning, this study selected a more accessible, more convenient SV-IVR and then expanded a landscape architecture SV-IVR learning system to assist the instructional in landscape architecture education (Wu et al., 2021). Both of these media are compatible with smartphones viewing the video. Using the smartphone as an instrument to run the spherical video-based virtual reality leads to simplicity during the classroom learning process.

Additionally, the SVVR evokes the learners' desire to learn the English language. Several media were introduced and employed by the lecturers to teach English, for example, Games, Kahoots, Quizzes, Google Classroom; these 'supplements' assist the teacher in running the lesson in the classroom. These applications contribute to the delivery of the lessons conducted by the lecturers in synchronous, asynchronous, face-to-face, and remote learning.

C. The effort expectancy (EE) on the use of Spherical Video-Based Virtual Reality (SVVR) used in the State Polytechnic of Bali

Table 7.: Students perception on the Spherical Video-Based Virtual Reality (SVVR)



Lastly, RQ3 addressed the effort expectancy (EE) point of SVVR. In the EE aspect, the simplicity of the application exertion appeared during the 360°-video utilization. The learners were sent the link by the lecturer, which was directly connected to Youtube. To run the 360°-video appropriately, this application would work properly using Youtube as this application had a specific and compatible component for 360°-video. It led the learners to feel convenient in running the SVVR. Besides, in terms of employing an online learning platform, the learners thought it was effective since it saves effort (Cakrawati, 2017). Likewise, the spherical video utilization offered simplicity through exertion. The tendency to choose a smartphone to operate the application resulted in the students' keenness to learn English. The intelligent smaller device, smartphone offer handy, small, and compatible for any situation; for instance, the device was recommended to reduce the rigidity in operating the SVVR.

Furthermore, every learner had access to a mobile phone which brought simplicity to running the 360°-video. Another component that the teacher and learners must consider is the internet connection. These assist the classroom in implementing the SVVR during the English language instruction. Having mobile technology and internet facility in hand, English language learners these days are open to many learning resources (Hidayati & Diana, 2019). Concerning the see the sphere, the viewers encourage to have a visual environment. The students could move the device to analyze the surrounding that supports them in obtaining new experience.

Discussion

The students understand and agree with the significance of contemporary kits nowadays for English language learning in the ESP classroom. This situation is underpinned by the fact that the young learners are familiar with the technology. The screenagers were born when the technology was developing, which means that they have been using it since they were early and were able to use technology meaningfully (Putra & Santosa, 2020). The positive side of this phenomenon is the avoidance of technology rigidity received by the millennials. This also may be dominantly influenced by the age of the users; the digital technology has been improved massively since a decade ago. Consequently, young generations do not feel strange about technology development as they engage

in it frequently. Similarly, education ought to immerse technology in the teaching and learning process in the classroom, but this argument must be evidenced by further research.

The previous study also believed that learners have a very positive perception of the use of Kahoot! in learning, and these results include a positive effect on attention, motivation, concentration, satisfaction, and confidence (Wang, & Tahir, 2020). Similarly, the role of SVVR as a tool provides an exciting impression in learning the English language. By engaging multimodal concept, which includes video, image, text, and audio as the learning material, students are keen to study the English language. This learning tool enhances language learning by providing immersive learning, improving motivation, creating interaction, and reducing learning anxiety (Huang et al., 2021). The presence of the visual, spatial, and gestures make the learners desire to get involved in the teaching and learning process. The 360°-video allows the learners to analyze and study English language skills involving speaking, writing and listening. The discussions are divided into 4 room which has a different environment. The students obtain a chance to explain the rooms using the English language by having a variety of spheres. The interaction will appear because the presenter on the video allows the viewers to analyze and answer the questions displayed in each room. The use of SVVR as the new English learning kit for Polytechnic education assign a specific understanding that this 360°-video is suitable for English lesson in the higher education system. On the other hand, playing the video from the Youtube program results in high demand on the internet band-witch. Receiving the high-quality 360°-video requires a high resolution that can be set from the smartphone.

Based on the SVVR video provided by the researcher, the scene started outside the Business Department building. From this area, the learners can see and analyze the environment by moving the smartphone or sweeping the device screen. Likewise, the learners could observe the object and environment in the audio-visual room, meeting room, office lab, and computer. Besides that, viewers are allowed to interact with other classmates to escalate their English language ability. On the other hand, to relish the 360°-video with better performance, the screen resolution should be escalated; the demand to set the smartphone screen resolution into high quality often complicates the learners. Moreover, the high quality requires high internet access to run the 360°-video. This circumstance inclines to debilitate the students who have a low internet connection.

Conclusion

The performance expectancy (PE) involving the device's positive impact and usefulness can be attained by employing Spherical Video-Based Virtual Reality (SVVR) in the classroom. The usefulness of the SVVR leads the learners to study English more efficiently. Employing multimodal including (Spherical Video-Based Virtual Reality 360°-video, text, audio, and image) as learning tools potentially encourage learners to study more in absorbing the knowledge. This learning kit also underpins the learners' desire, especially in learning the target language. The tendency of the new medium, which offers different experiences, positively impacts the students learning objective.

Similarly, the students seem to support and favor the effort expectancy (EE), including the ease of technology use in this video. By having this learning tool, learners incline to be convenient to watch the 360°-video through the smartphone. The learners tap the link uploaded to Youtube by the lecturer and start to watch the video. The viewers can also move the smartphone to see the environment or spherical, leading to a new way to learn the materials. Engaging the Business Administration's building environment as the setting of this video assists the students in virtually understanding the campus sphere. This contributed to the learners' ability to explain the environment using English during the lesson activities. In line with that, the virtual building surrounding significantly encouraged the learners' study during remote learning. The compatibility of the learning medium for online learning will be beneficial for the remote learning system. Students can play the 360°-video from home using their smartphones.

This learning tool can be fruitful for the lecturers who teach General English and English for Specific Purposes in the Polytechnic education system. By providing and generating the new model of learning

tool, the lecturers can quickly deliver the knowledge to the students. The SVVR is a substantial learning kit for lecturers who desire to escalate learner eagerness and ability to engage in the English language. The combination of internet, video, audio, and text is known as multimodal and can be the criterion in creating the learning kits. The opportunity of generating the learning materials based on the multimodal concept can be the nutrition and supplementary for the learners in absorbing the English language learning. It means digital technology and multimodal are the fundamental concepts for building learning media during asynchronous, synchronous, face-to-face, and remote learning in the digital era. Immersing Spherical Video-based Virtual Reality is the new trend for classroom teaching and learning activities, which ought to be applied frequently by the lecturer and students in the English language lesson.

However, the shortcoming ought to be decreased to optimize the use of this medium in the classroom. One of the procedures is allowing the learners to select the average video quality during online or remote learning. Students who cannot access the video with high resolution are recommended to apply the medium quality; as a result, it can significantly reduce the barrier to watching the video during the lesson. As previous research points out, VR is not always shown to be the most effective way to impact perception, depending on the metric used (Lindquist et al., 2020). The shortcoming of this medium can be a barrier for the learners to use and apply it through the instructional. The expensive hardware and low internet access decrease the students' urge to experience this tool. It is vividly seen that lost and low internet access can be a massive barrier for the students to play the 360°-video that must be solved in the future. Another substantial focus is that this study was not exercising the social influence (SI) and facilitating conditions (FC) which are another part of UTAUT theory that can be explored in future research.

Conflict of interests

The authors declare that they have no conflict of interest.

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