

Community Assistance to Improve the Ability to Use Basic Unity and Virtual Reality

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Abstract

During the pandemic of Corona Virus Disease 2019 (COVID-19) that hit Indonesia, all activities were very limited. Electrical Engineering Study Program of Universitas Kristen Maranatha was motivated to share knowledge especially in the field of science about "Basic Unity and Virtual Reality (VR)" to the public. This has been realized through community service activities pursued by students and lecturers. VR refers to computer simulations that create images of the world that appear in human senses, in the same way as humans perceive the real world in reality. This community service used the Participatory Action Research (PAR) approach. From the results of a survey of community service activities that have been carried out, it is concluded that the success in providing mentoring to improve the ability of the community to use Basic Unity and VR online, is shown by the results of an increase in the score from an average of 5.85 before the activity, to 7.58 (from a total score of 10) after the activity. The community service committee team's service during the activity was also considered very good and worthy of being maintained in subsequent activities. Meanwhile, the implementation of providing teaching materials, the readiness of the trainers, and the implementation of organizing activities online, still need to be re-evaluated and improved in the future for better results.

Keywords: basic unity, COVID-19, participatory action research, virtual reality

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Introduction

The Corona Virus Disease 2019 (COVID-19) pandemic that has hit Indonesia has forced all people's physical activities to be carried out with strict restrictions. One of the steps taken by the Government of the Republic of Indonesia was to issue Government Regulation Number 21 of 2020 concerning Large-Scale Social Restrictions (*Pembatasan Sosial Berskala Besar*, PSBB) on March 31, 2020. The purpose of PSBB is to limit certain activities of residents in an area suspected of being infected with COVID-19 in such a way to prevent the possible spread of COVID-19. This PSBB is a restriction on the movement of people and goods for one particular province or district/city, at least covering school and workplace closures, restrictions on religious activities; and/or restrictions on activities in public places or facilities (Peraturan Pemerintah RI, 2020).

With the PSBB, all kinds of direct face-to-face activities were reduced and even temporarily stopped. Conditions like this caused limited community activities to be carried out at home and activities for learning and self-development were also limited. The role of the university as an educational institution is to carry out one of the tasks to carry out the *tridharma* of higher education. One of the *tridharma* of higher education is community service. The Electrical Engineering Study Program at Universitas Kristen Maranatha carries out community service activities to share knowledge with the community.

The main difference between online and onsite learning is that online participants do more reading and writing activities compared to onsite participants who do more speaking and listening activities. Types of online learning are divided into two types, namely synchronous and asynchronous. Synchronous learning is learning where the presenter and participants are online at the same time, the presenter delivers the material in real-time. Meanwhile, asynchronous learning is the opposite of synchronous learning (Bowman, 2010).

One of the fields of knowledge that students and lecturers of the Electrical Engineering Study Program are currently pursuing is Basic Unity and Virtual Reality (VR). Unity is a game engine (game maker software) that can create 2D or 3D games. Unity also provides various platforms such as mobile apps, PC/Mac, VR, Augmented Reality (AR), and others. VR and AR are emerging technologies at the moment. VR or virtual reality refers to computer simulations that create images of the world that appear to the human senses, in the same way that humans view

the real world in reality (Craig et al., 2009). VR is a medium consisting of interactive computer simulations that can perceive the positions and actions of participants (users) and then provide synthetic feedback to one or several senses that give the feeling of being present in the simulation (Craig et al., 2009). VR applications exist in various fields such as medical, education, arts, entertainment, military, and others (Burdea & Coiffet, 2003).

With the development of Basic Unity and VR technology being applied in various fields (driving simulators, operation simulators, visualization of building designs, tourism, simulating sports matches, mental training, etc.), the need for information dissemination of the use of Basic Unity and VR is becoming clearer. For children nowadays, making games also attracts attention and is needed in game development as well as in the learning process, so this technological capability will really become a necessity in the future. This is the basis for the community service process of developing the ability to use Basic Unity and VR in society.

Methods

This community service activity utilized a Participatory Action Research (PAR) approach. PAR is a participatory approach to action-oriented research. PAR involves researchers and participants working together to test problem situations, or actions to make changes for the better (Wadsworth, 1998). PAR has three main pillars namely the research dimension, the action dimension, and the participation dimension. The goal is to encourage transformative action or change (Z et al., 2021). PAR is not only used as a research method but is also referred to as an approach to community empowerment and development (Soedarwo et al., 2022). The PAR method also provides an opportunity for the assisted object to carry out empowerment with a model scheme offered by activity implementers for assistance, monitoring, and development to be carried out later (Setyaningsih & Asnawi, 2021).

Several community service activities that had been carried out using the PAR approach are community service activities to provide knowledge, competence, and skills, especially in the field of Internet of Things (IoT) technology, to *Karang Taruna* Haur Galur Sukagalih, Bandung City. The training showed an increase in the percentage of knowledge of all participants (Sartika et al., 2020). Another community service activity utilizing PAR is the activity of assessing the extent of community participation in development programs carried out by the government for the Bagan Deli Village, especially the National Community Empowerment

Program (*Program Nasional Pemberdayaan Masyarakat*, PNPM) for urban independence. Through PAR, formulas can be produced that are in accordance with the conditions of the community in carrying out community empowerment efforts (Rahmat & Mirnawati, 2020). Another activity that also uses PAR is the presentation of the stages of empowerment and development of tourism villages in Indonesia, namely Ngadas Village. This village is an agricultural village that has not been managed and developed properly due to limited village facilities and infrastructure. The results of this activity contribute to the development of local tourism in developing countries, especially in Indonesia (Soedarwo et al., 2022).

This community service activities had been carried out online using the Whatsapp application media and the Zoom application, was carried out for three hours. The Whatsapp application was used to facilitate communication between participants because before the activity was carried out a few days before, information had been distributed regarding guidelines for installing applications needed during community service activities. If there were obstacles/problems, participants could contact the committee so that when the activity is carried out it can run smoothly and effectively.

Community service activities were carried out using the Zoom application which was guided by presenters and assisted by a moderator as well as student assistants and lecturer assistants with a total of 10 people. The number of participants who attended was 55 people. The comparison ratio between presenters and participants was around 1:11. At the beginning of community service activities, participants were given a pre-test to test their abilities before the activity was carried out. The material for community service activities is divided into 3 sessions. Session 1 was an introduction to Unity, Unity Editor, and Game Objects. During session 1, as long as the presenter delivers the community service material, participants must practice directly using the Unity application and participants can directly ask the speaker or committee. Each assistant was responsible for immediately helping participants if there were problems. Assistance was provided via Zoom media chat, or chat and calls via Whatsapp.

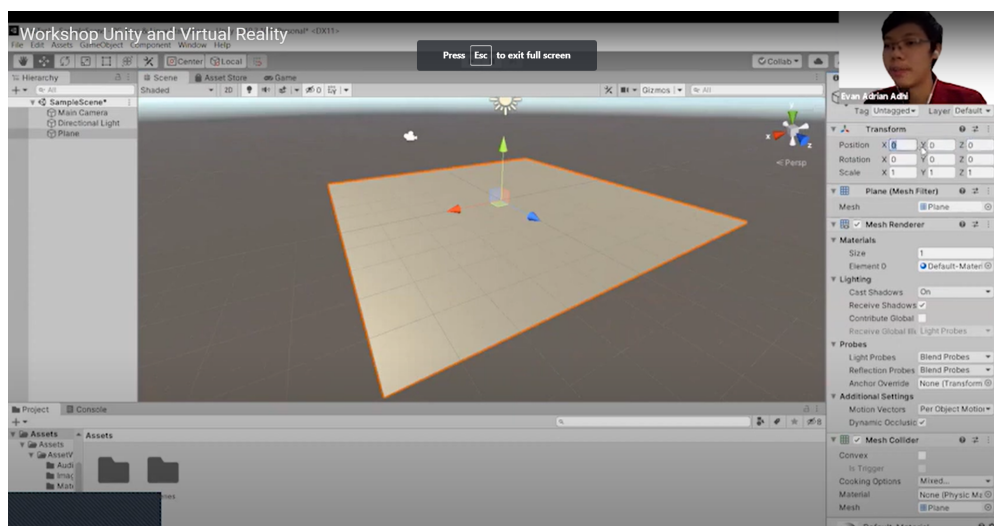


Fig. 1. Documentation of activities during session 1

In session 2, the completion of the given project/case was carried out. In this session, participants were given cases/projects related to the Unity program, participants were challenged to make a tank games. Session 2 was the same as session 1 where assistants and presenters gave tutorials directly to participants. After the case/project had been completed, the community service material was continued with an explanation of the User Interface of the application being made.

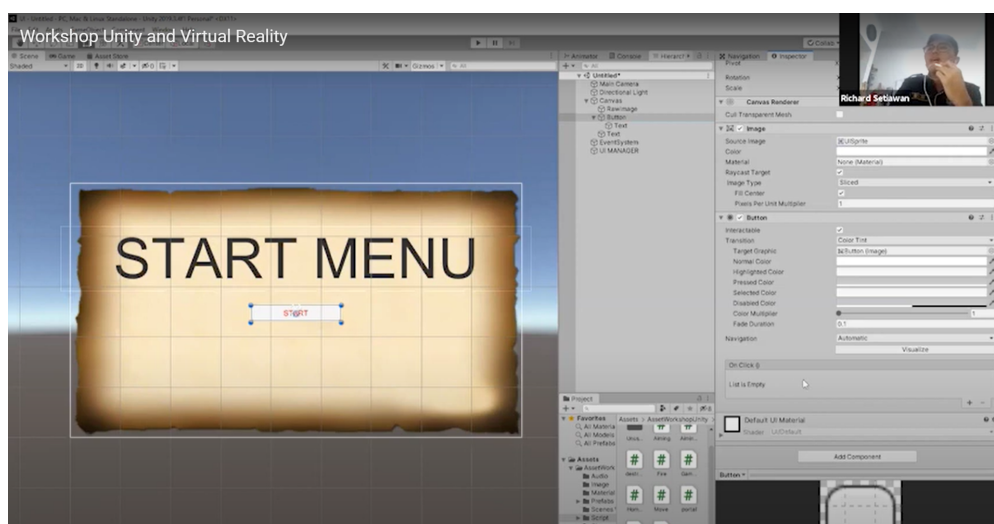


Fig. 2. Documentation of activities during session 2

The end of this community service activity was session 3 where a VR demo was held. In this session, a demo was carried out regarding Unity projects/cases that had been worked on and then integrated into VR devices. The tank game project that has been made is then

demonstrated by an assistant using VR. Demonstrations from assistant when using VR and the display of unity being played can be seen by community service participants.

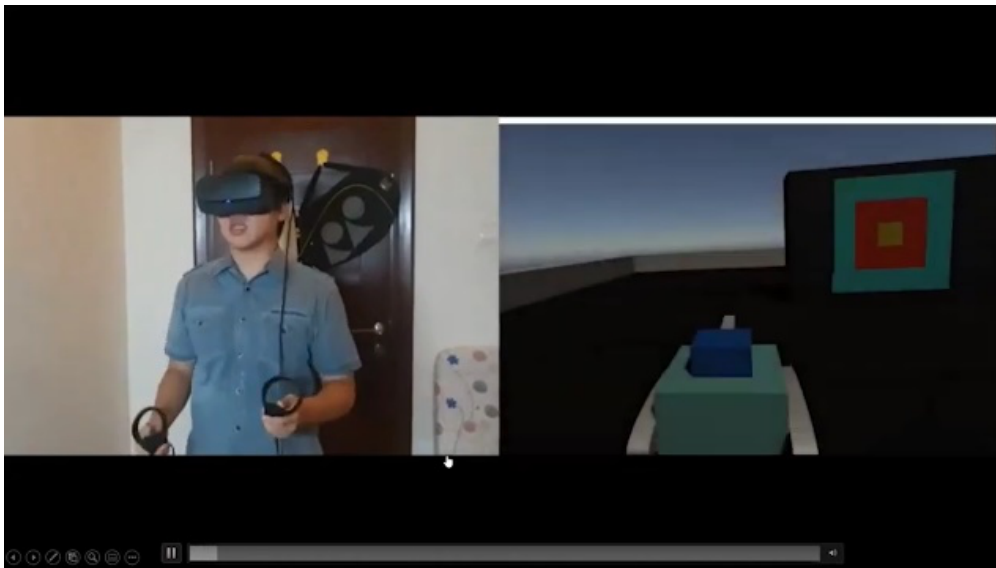


Fig. 3. Documentation of activities during session 3

After session 3 was over, participants were asked to show the results of projects/cases that had been worked on. For participants who successfully showed their projects, appreciation would be given to motivate other participants. At the end of the session, a post-test was given to measure the understanding of all participants.



Fig. 4. Documentation of participants in community service activities

Results and Discussions

In this community service, participants are given a pre-test and post-test, the pre-test measures the participants' initial abilities before being given community service, then the post-test is also given the same questions (consisting of 10 questions) to participants after the community service process society is done. From the results of the pre-test and post-test, the results were obtained in the form of the percentage of correct answers from the participants for each category of questions given. The results of the percentage of participants' answers is exposed in Figure 5. From each category of questions, there was an increase in the correctness of the participants' answers. More detailed percentages can be seen in Table 1.

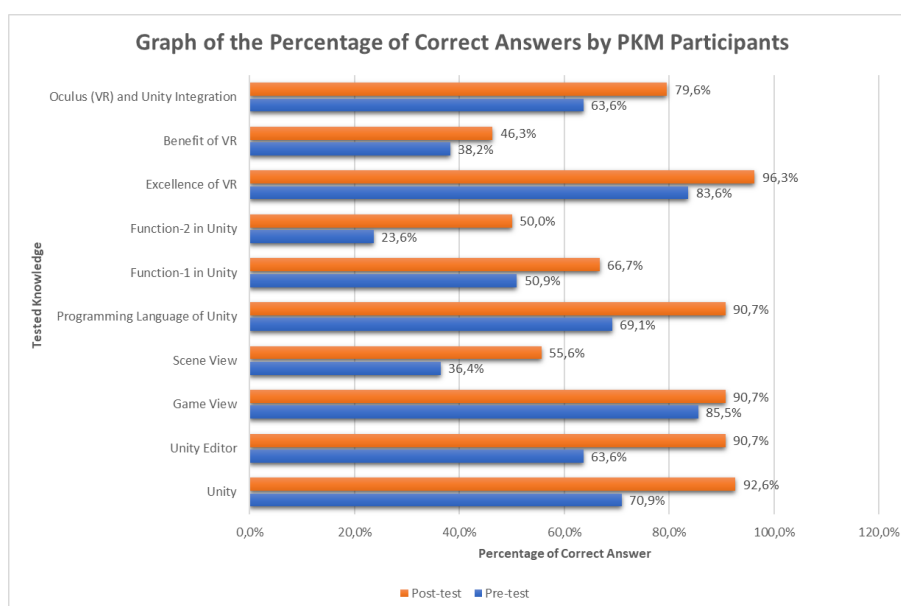


Fig. 5. Graph of the percentage of participants' correct answers

Table 1. Table of the percentage increase in correct answers by participants

Knowledge about	Pre-test	Post-test	Increase
Unity	70.9%	92.6%	21.7%
Unity editor	63.6%	90.7%	27.1%
Game view	85.5%	90.7%	5.2%
Scene view	36.4%	55.6%	19.2%
Programming language of Unity	69.1%	90.7%	21.6%
Function-1 in Unity	50.9%	66.7%	15.8%
Function-2 in Unity	23.6%	50.0%	26.4%
Excellence of VR	83.6%	96.3%	12.7%
Benefit of VR	38.2%	46.3%	8.1%
Oculus (VR) and Unity integration	63.6%	79.6%	16.0%

When viewed from the total score of the participants, there was an increase from the pre-test results with the average test score is 5.85 (out of a total score of 10), and after the post-test, the average score was increased into 7.58 (out of a total score of 10). So, from all the participants who attended, there was an increase in score of 17.8%.

Figure 6 shows the graph of the pre-test results tends to be on the score on the left (low scores towards high scores), shifts to the post-test graph to the right (medium scores towards high scores)

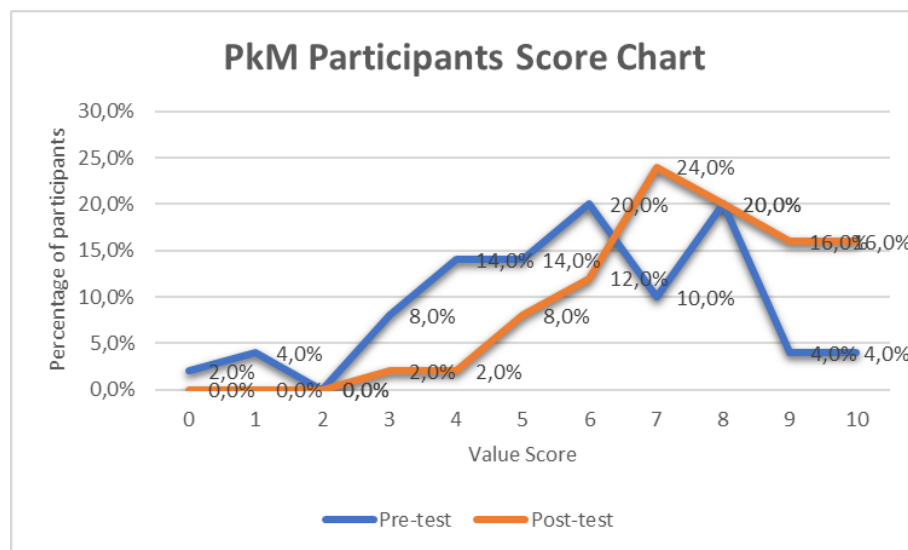


Fig. 6. Graph of participant scores

The readiness of participants in this community service activities to participate in activities is very high. As many as 92.7% of participants have installed the Unity application program which can be seen in Figure 7.

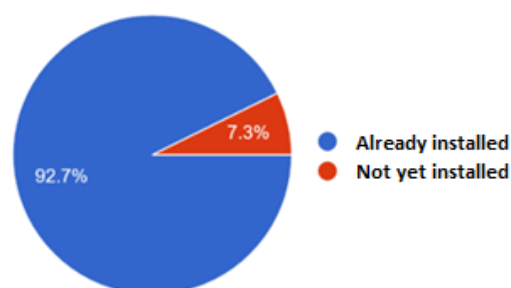


Fig. 7. Graph of participants' readiness to install the Unity program

The enthusiasm of the participants in participating in this community service activities was very high. As many as 90.4% of the participants took part in the activity from start to finish, which can be seen in Figure 8. This large percentage was made possible because ready-to-download software and software installation guides were provided to activity participants before the activity was carried out.

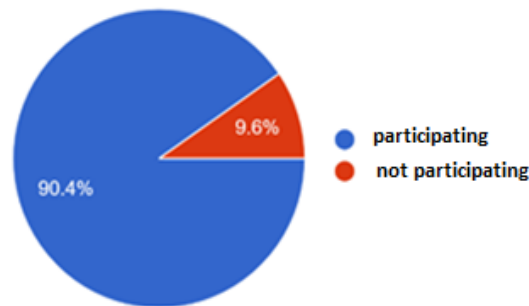


Fig. 8. Graph of participants' level of participation in working on project until the end session

The response from participants in this community service activities to the committee's services was considered very good.

Based on the evaluation of the results of the questionnaire, for the material presented meet participants' expectations (86.9% agreed, see Fig. 9), the readiness of the presenters (91.8% agreed, see Fig. 10), and the implementation of the online community service activities can be further improved though on average the participants rated it quite well (88,5% agreed, see Fig. 11), there is still room for improvements.

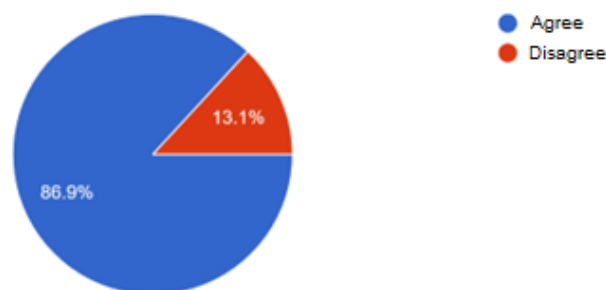


Fig. 9. Graph of material presented meet participants' expectations

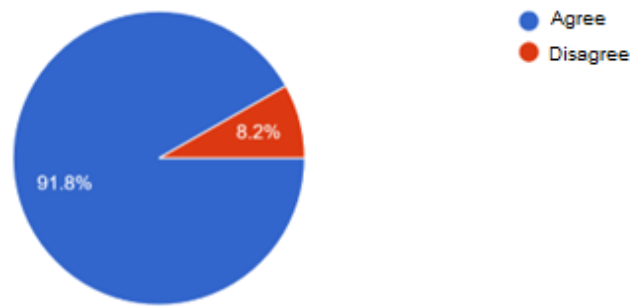


Fig. 10. Graph of the readiness of the presenters

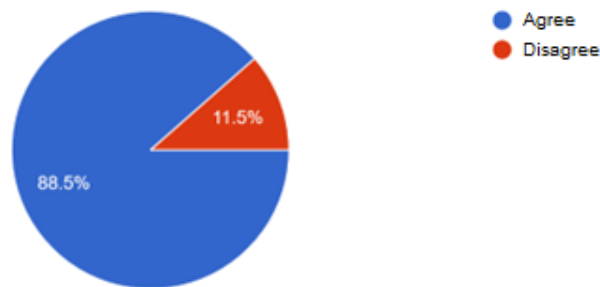


Fig. 11. Graph of the implementation of the online community service activities

Conclusion

The community service activities that had been carried out have succeeded in providing community assistance to improve online Basic Unity and VR skills. From an average value of 5.85 (out of a total score of 10), it increased to 7.58 (out of a total score of 10, there was an increase in score of 17.8%). This means an increase in understanding with community service participants. It is hoped that increased knowledge and skills can be further improved in future community services in the form of onsite meetings.

The committee's service during the activity has been very good and must be maintained. Meanwhile, the implementation of community service activities in terms of material, the readiness of the presenters, and the implementation of online community service activities must be evaluated and improved so that further activities can be even better. The continuation of the dedication to using Basic Unity and VR will be the initial basis for developing research that requires Basic Unity knowledge and participants who are accustomed to using VR so that it can assist in its application in everyday life.

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