Training on Making 3D Models of Augmented Reality Based Hydrology Education Tools for Teachers

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Abstract

Augmented reality in its development in Indonesia has been used as an auxiliary medium classroom teaching for learning to become more interactive between teacher and student. Students get study independent with an observed tool developed augmented reality display without need guided. However, sadly still how difficult development augmented reality application, making not yet how many teachers can develop application based on augmented reality. On the basis of such, he did activity devotion to public in form training creation of 3D models based on augmented reality followed by representatives from teachers from all over Palopo as many as 15 teachers. Activity training is shared into 3 sessions, ie session first through method lecture, session second guided tutorial methods and sessions final with practice. Result of implementation training This is a capable teacher making augmented reality application for free independent and capable tool display hydrology based on augmented reality that can be used for enrich classroom learning.

Keywords: Community Service, Augmented Reality, Hydrology

Introduction

Augmented reality technology is one innovation that can create digital illusion where as if normal 3D objects exist in the digital world and present interact in the real world (Azuma, 2017; Moore et al, 2020). Presence digital objects in the real world facilitate the learning process, where students can in a manner directly interact, observe and experiment with objects (Hardianto et al, 2020; Zamzuri et al, 2020). This impacts positively in developing deep student knowledge manager information (Wójcik, 106; Vaughan et al, 2017). However, for can produce a teaching products based on augmented reality very difficult specifically for teachers, because technology this still belong new so that still a little developer can control technology this. Though, a lot very benefits that can generated from technology this like tool display based on augmented reality tools on the introduction of the solar system, tools learning hydrology and tools display education others of course can developed by teachers with variety eye lessons he has mastered (Arifitama, 2015; Syahputra et al, 2018).

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Through initiative organization Association Supervisor School All Indonesia (APSI) bridging activity training augmented reality creation for teacher representatives throughout Palopo. Activity training This makes duties and obligations for lecturers as activity devotion to society on the side of teaching and researching (Zhou et al, 2019; Høyer et al, 2017). Participant from activity This totaling 15 teachers with various backgrounds behind discipline required knowledge about augmented reality and creation augmented reality application. Hydrological processes selected based on augmented reality as example application tool demonstrations, as well as illustrations application augmented reality technology in science eye lessons to be learned used at school (Sanchez et al, 2016).

Method

Devotion to society that has been carried out, carried out with method lecture, method practicum and evaluation in accordance with need from participant activity training and assurance that the participants can understand and can build augmented reality applications for free. Method lecture used as an approach in delivery appropriate teaching materials to participant training (Oswald et al, 2019; Li et al, 2022). Basically, use method lectures only can be done For as opener from activity training as well as explain material base to the participants still training lay to topic or theme from augmented reality training. As for the arrangement given material with method lectures is such as: (1) Introduction in a manner general about Augmented Reality; (2) History of the Development of Augmented Reality; (3) Potential Development of Augmented Reality as a Teaching Tool (Bernardes et al, 2018; Wibowo et al, 2022).

However method lecture no suitable applied throughout session training because lesson walk tend boring because participant no given chance for find alone concepts being taught, participants become pas only active make notes course, and density the concepts being taught can impact on the participants no capable control taught material, for that needed method other for support ability technical from the participants training, that is training gradually or called method practicum (Opriş et al, 2018).

According to (Woods et al, 2016; Pratiwi et al, 2013) understanding that method practice is a learning process Where participants educate, do learning with experience, following the process, observing object, analyze, prove and draw conclusion something object as can be seen in figure 1.

![Figure 1. Method Practice](image-url)
As for the arrangement material from implementation practice namely (Chou et al, 2018): (1) Introduction of Unity as a development platform; (2) Introduction of Vuforia SDK as an augmented reality SDK; (3) Introduction of basic tools unity application; (4) Making scenes in unity; (5) How changing materials in unity; (6) Work with canvas in unity; (7) Making markers in Vuforia; (8) Unity settings for augmented reality; (9) Create tool Demonstration Hydrology (Afroz et al, 2018; Leinonen et al, 2021; Wolf et al, 2021). Method the latter applied to training This is evaluation, where evaluation is needed to ensure that participant training can understand and can operate instructions that have been given at the time practicum. Method This is important done as bait given back from participant to executor devotion.

Results and Discussion

Devotion to organized society in form training during a day executed by one lecturer of Informatics Engineering Study Program based on invitation given. Activity devotion This started with lectures by speakers like in picture 2.

In Figure 2, sources currently do activity lecture in front of the participants training, where the theme described is about explanation general about augmented reality technology, where augmented reality technology in Indonesia itself has present since the beginning 2012, where technology This give innovation that can used in education, for give visualization object or tool props used in the learning process. Training This specialized to give Skills base to the participants for creating augmented reality later can be used in the learning process in class (Pajorová et al, 2020; Takrouri et al, 2022). When done with activity lecture, then next with activity furthermore is with implementation possible practicum seen in figure 3.
Figure 3. Implementation Practice

Figure 3 represents an image of the implementation process practicum, where the source person demonstrates stages from making an augmented reality object. In session this augmented reality explanation is done with a method gradually about making application hydrology based on augmented reality (Takahashi et al, 2017; Griffiths et al, 2019). A number of activities in formation stages of hydrology can be seen in Figure 4.

Figure 4. City Landscape Making

Figure 4 is stages of basic landscape formation of residential and neighborhood areas around like mountains and trees, making landscapes in training This utilizes the Unity platform as a development platform.
Figure 5 represents picture formation particle rain, where base component particle if run will No order, on configuration particle added component gravity agar particles grab as if down like rain. Figure 5 represents picture creation of menus from application hydrology based on augmented reality, where the user will push knobs in accordance with order hydrological processes occur from normal conditions, evaporation, rain and finally is rain.

**Figure 6. Augmented Reality Cloud Formation Process**

Figures 6 represent results from application hydrology based on augmented reality which is a process of formation of clouds that ends in a simulation of rain falling from clouds. After executing activity practicum, then end from activity (Zhang, 2019). This is evaluation of the participants Where activity evaluation (Wang et al, 2018; Kulikajevas et al, 2019). This done with method see are the participants capable do all instructions during training, and results from evaluation that whole participant can make augmented reality app with ok. Augmented reality in its development in Indonesia has lots used as an auxiliary medium classroom teaching for learning to become more interactive between teacher and student. Students get study independent with an observed tool developed augmented reality display without need guided. However sadly Still how difficult development augmented reality application, making Not yet how many teachers can develop application based on augmented reality. So carrying out community service activities in the form of training in making 3D models based on augmented reality.

**Conclusion**

Activity training is shared into 3 sessions, ie session First through method lecture, session second guided tutorial methods and sessions final with practice. Result of implementation training This is a capable teacher making augmented reality application for free independent and capable tool display hydrology based on augmented reality that can be used for enrich classroom learning. Implementation devotion to the public with theme training making application tool display based on augmented reality is successfully executed and all participants can build augmented reality based application guidance from the coach. Result of devotion This can be beneficial for teachers as material enrichment learning.
Acknowledgment

References


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