

Development of the Virtual Reality Simulation for Response of the Problem with Learning Engagement in Collaborative Learning

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Abstract: The purpose of this study was to develop a collaborative learning teaching simulation for teacher training. This study aims at developing teaching simulation for pre-service teachers in order to response of the problem with learning engagement in collaborative learning. This study consisted of two parts: 1) simulation design, 2) simulation development. In the simulation design phase, this simulation was designed scenarios, virtual classroom, student avatars and simulation system. The problem with learning engagement was caused by conflicts with group members. In this study, conflicts factors were classified into three categories and these three scenarios were applied for this study: 1) off-task behavior, 2) unfair engagement, 3) bad relation. Unity 3D engine used developing a virtual classroom and interaction interface which to interact between pre-service teacher and student avatars. iClone6 and Crazytake8 were used to make students avatars with 3D models. This teaching simulation provided authentic experience for pre-service teacher by applying Head Mounted Display (HMD).

Keywords: collaborative learning, engagement, classroom behavior, teaching simulation, teacher education

INTRODUCTION

Collaborative learning is a type of learning in which two or more learners learn in groups. Sharing and understanding learning goals is an important factor to achieve (Rapchak, 2018). Unlike Individual learning, collaborative learning requires all group members to must actively participate in social interaction (Leimeister, 2014). Interaction provides an important learning experience in collaborative learning.

Engagement of all group members can facilitate the social interaction in collaborative learning. Learners should actively engaged in Collaborative learning, rather than learning passively by teachers (Son, 2016). In collaborative learning, participation of learners may be compromised by multiple causes, such as social relationships and interdependencies among members. The problem of decreased engagement in the learning process is not due to individuals but rather to the complex interactions between learners during the course of collaborative learning. Therefore, it is important to accurately diagnose and take proper action on the causes of the decreased desire to participate in collaborative learning. The most important factor for effective collaboration is teacher guidance to ensure that members can interact well.

Gillies and Boyle (2010) stated that many teachers have difficulty to implement collaborative learning,

they need to be prepared to implement them effectively in the course of teacher training. Therefore, It is necessary to train knowledge and skills to teach collaborative learning for pre-service teacher (Ruys, Van Keer, & Aelterman, 2011). By providing simulation of the classroom situation, pre-service teachers can experience learning scenes similar to real classrooms. Pre-service teachers can learn professional skills as teachers through simulation (Toom, Pietarinen, Soini, & Pyhältö, 2017).

This study aims at developing teaching simulation for pre-service teachers to train collaborative learning instruction skills in order to response with engagement problem in collaborative learning.

MEETHODS

Simulation Design

Scenarios causing learning engagement problems

Han, Park & Woo (2013) classify problems in collaborative learning into 9 categories. In this study, choosing problems that can influence learning engagement caused by conflict with group members among those categories. These 3 scenarios were applied in this study.

1) Off-task behavior

It means that some of the group members do non-learning activities such as chat. If this continues, the

other group members have no energy to do a love of learning.

2) Unfair engagement

It means that members are involved collaborative learning differently. When some learners take the lead in collaborative learning, others' willingness to participate decreases. On the other hand, an active learners' willingness to learn decrease if someone that unaccompanied learner score same achievement.

3) Bad relation

Some group members have a bad relationship. Then they might not want to learn each other. In this case, It is difficult to achieve in collaborative learning. It also affects other members' willingness to engagement in learning.

Virtual Classroom and Student Avatar

Virtual Classroom was designed similarly to real high school classroom. It designed a space where 16 student avatars could be placed. Also it was designed as a desk layout for collaborative learning. Student avatars divided into two types depending their roles. Student avatars' role in main group is that causing problems in collaborative learning to promote interaction with users. Others are members of the classroom without interaction. They were designed with idle gestures naturally.

Experimental Design

This study will be investigate the effect of instructional design and display on the teaching efficacy and virtual presence in teaching simulation. Figure 1. shows the research model.

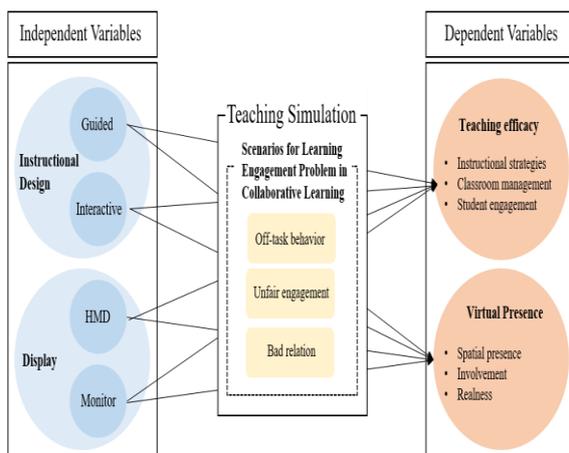


Figure 1. The research model.

RESULTS

Simulation Development

Virtual Classroom and Student Avatar

Virtual Classroom was developed by Unity 3D engine, Google SketchUp, 3DXChage. Student Avatars were developed by iClone6 and Crazytalk8. Figure 2. shows Virtual Classroom and Student Avatars.



Figure 2. Virtual Classroom with student avatars.

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