

# **Study of An Approach to Amelioration of Illustrated e-Learning Contents by Using the Augmented Reality**

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In general, the learning content used in e-Learning system is prone to one-sided outbound of information. It is difficult to use in student experiment course require work with the real tools. For example, description about experiment equipment is doing by some illustrated or pictures. In our university, such student experiment had been carried out using the illustrated of description about how to operate equipment. However, there are some students who has vague understand about experiment equipment. We have need to study new way of support to such students. So we develop new contents that able to understand more easily than existing contents to improve understanding of student.

We think that students will easily understand how to operate equipment by watch the real things rather than watching them illustrated. Therefore, we are trying to synchronize the movie of actual equipment with instructions for students. However, it was difficult to recognize equipment in student's environment to synchronize the instruction through e-Learning contents. Therefore, we were focused attention on the AR (augmented reality) technology to solve this issue. By using it, we can make a new e-Learning content that is showing teachers on the actual environment through 3D computer graphics models with some instruction information.

We developed a prototype of new e-Learning content to ameliorate student experiment environment using the FLARToolKit. This content is written by the Action Script 3. Because of this, teachers can embed the contents into a Web page as flash contents. Using it, the teacher can teach with actual equipment by superimpose the instruction to actual-world environment. Because of this, the student can further experiments while watching the direct instructions that superimposed on the image of an actual equipment through a Web-cam. We expect that the students will be able to understand how to operate equipment more easily by using this content.

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