AdEPT

Augmented Reality- and AI-based learning, teaching and collaboration tool for corporate education and training

In the AdEPT project of the DFKI research department Smart Enterprise Engineering, an Augmented Reality-based learning and teaching tool for corporate education and training is being developed. It includes an AI-based peer tutoring functionality that dynamically and context-sensitively initiates learning partnerships between students in training workshops or classrooms.

The processes modeled using the AdEPT authoring system can be loaded onto AR devices like AR glasses. Learners can then go through the AR-supported learning process. In principle, there might be a risk that students isolate themselves when conducting AR-supported learning processes, as AR glasses can create a barrier for student interaction. This, in turn, can result in a lack of collaborative learning between students, which typically is a beneficial characteristic of training workshops and classrooms. In the AdEPT project, this aspect was considered. A proof-of-concept for an AR-supported peer tutoring system was developed, which aims to specifically break down the barrier between AR device-carrying students. This happens by allowing students to trigger a support request while performing an AR-supported task.

In addition, new social contacts between students can be initiated through such a system.

After the peer tutoring is completed, an evaluation of the tutor by the other student can take place, potentially providing additional data for a learning analytics platform.

The AdEPT system consisting of authoring system, AR process guidance and collaboration functionality is being developed and tested together with the project partners FoBiD, KME, Kampmann, BBS Osnabrück Brinkstraße and BBS Melle.
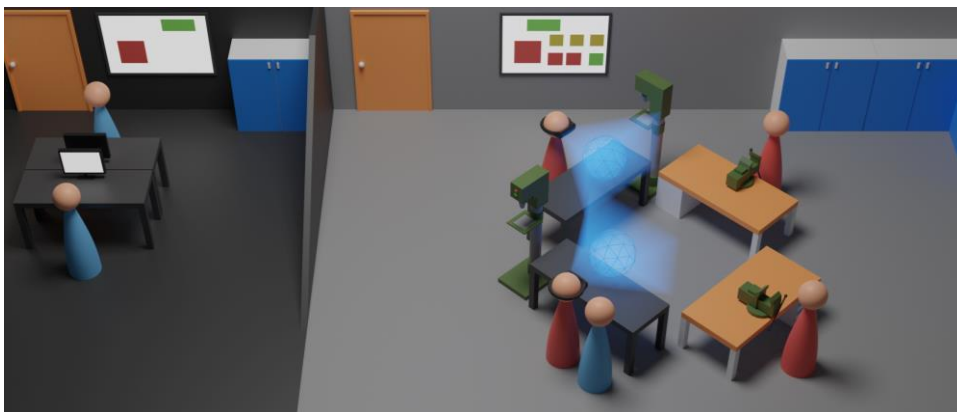
Lessons in corporate education and training can be supported by augmented reality (AR) devices. AR devices display digital learning content (texts, videos, learning level checks, etc.) into learners' fields of view while they are performing a specific task. In the BMBF-funded AdEPT project of the funding line „Virtuelle und Erweiterte Realität (VR/AR) in der beruflichen Bildung (VRARBB)", an AR learning environment is being developed that will help trainers and vocational school teachers to transform their learning processes into AR-supported learning processes using an authoring system that provides the user with several generic AR-elements for the didactic context.

Each student is represented by its own autonomous software agent. All student agents calculate the marginal utility of the support request and in turn send this value to all other student agents via a broadcast using a MQTT-message broker. The student agent with the highest marginal utility assigns itself to the request and indicates to the respective student that a support request can be answered. If the requested student agrees, the peer tutoring begins. This allows the "tutor" to repeat and consolidate his own knowledge.

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