

The Heb@AR App – Five Augmented Reality Trainings for Self-Directed Learning in Academic Midwifery Education

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Abstract: The academization of midwifery education entails novel challenges. To second the transition process, the Heb@AR App is an innovative Augmented Reality (AR) training application. It is currently being deployed for self-directed and curricular on-site learning in several midwifery degree programs in Germany. The aim is to strengthen students' practical competencies, especially for emergency situations. Hereby, the Heb@AR App is available through the app store on handheld (Android & iOS) devices for free and currently offers five midwifery-specific training scenarios.

Keywords: Midwifery, Augmented Reality, Learning, Training, Education, App, Smartphone

1 Midwifery Academization and Project Heb@AR

Since 2020, German midwifery education is undergoing full academization. While this is a necessary transition, the theory-practice transfer still has to be supported. Especially emergency management, while working in accordance with guidelines, must be practically trained. In the BMBF project Heb@AR (2019-2022), the utilization of handheld AR trainings as a supplement to the practical training in academic midwifery education is explored. To be identified is its potential in terms of acceptability, scalability, viability, and longevity [BL20]. For this purpose, emergency AR trainings were deployed in the curriculum of the midwifery study program at the Hochschule für Gesundheit Bochum. As preliminary evaluations are promising, we are implementing Heb@AR trainings into two additional midwifery study programs. Moreover, we publish them as a free Android and iOS app to make them available for midwifery students and other institutions to use.

2 The Heb@AR App

This Heb@AR App is the aggregation of the AR trainings developed during the Heb@AR research project [BL20] and bundles five AR trainings (cumulating to more than 4 hours of raw AR training content) with onboarding material for students and teachers,

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supplementary material for institutions to utilize the app, and training assessment utility. Hereby, the Heb@AR App is more than a prototype. It was and is continuously evaluated and improved regarding its usability, students/teachers' perception and learning outcomes, using a design-based research methodology. Additionally, lecturers are being actively trained in workshops to utilize the app. The five AR training scenarios currently included are shown in Fig. 1: Firstly, the preparation of an emergency tocolysis, a training where students prepare a contraction-inhibiting medication, that can be trained location independently. Here, AR is used with purely virtual objects and the contextualization into the physical reality is used to enable embodied interactions for psychomotor learning. (Fig. 1.a) Followed by the preparation of a birthing person for a cesarean section: An on-site AR training for holistic competency development through contextualized AR guidance on a generic training manikin. Here, decisions have to be made on what action is performed next, the action is visualized in AR and students can then freeze the AR view, place the smartphone out of their hand and imitate the contextualized AR action using both hands (*Decide-Freeze-Imitate*). (Fig. 1.b) Furthermore, the resuscitation of a newborn. In this emergency training, students train the resuscitation algorithm for a newborn through the *Decide-Freeze-Imitate* concept on a generic newborn training manikin. It can be trained on-site, either alone or with up to 6 fellow students. It includes training the sequence and motor skills of the algorithm and simulates visual and auditory symptoms. (Fig. 1.c) This resuscitation scenario is also available as a virtual version with a resuscitation unit, where students train the procedural sequence of the algorithm without the appropriate motor components. It can be trained location-independent without additional material. (Fig. 1.d) Finally, the anatomy of the female pelvis is a virtual AR training, where students can contextualize German-Latin terminology on a virtual pelvis for concept learning. (Fig. 1.e)



Fig. 1: The five AR trainings of the Heb@AR App shown on Android and iOS devices.

Literaturverzeichnis

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