

Design of the Intelligent Virtual Learning Coach. A Contextual Learning Approach to Digital Literacy of Senior Learners in the Context of Electronic Health Record (EHR)

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Abstract : The call for the support of senior learners in the development of digital literacy has become prevalent in recent years, especially in view of the aging societies paired with advances in digitalization in all spheres of life, including e-health. The goal has been to create opportunities for learning that incorporate the use of context in a reflective and dialogical way. Contextual learning has focused on developing skills through the application of authentic problems. While major research efforts in supporting senior learners in developing digital literacy have been invested so far in e-learning, focusing on knowledge acquisition and cognitive tasks, little research exists in reflective mentoring and coaching with the help of pedagogical agents and addressing the contextual dimensions of learning. This paper describes an approach to creating opportunities for senior learners to improve their digital literacy in the authentic context of the electronic health record (EHR) with the support of an intelligent virtual learning coach. The paper focuses on the design of the virtual coach as part of an e-learning system, which was developed in the EPA-Coach project founded by the German Ministry of Education and Research. The paper starts with the theoretical underpinnings of contextual learning and the related design considerations for a virtual learning coach based on previous studies. Since previous research in the area was mostly designed to cater to the needs of younger audiences, the results had to be adapted to the specific needs of senior learners. Next, the paper outlines the stages in the design of the virtual coach, which included the adaptation of the design requirements, the iterative development of the prototypes, the results of the two evaluation studies and how these results were used to improve the design of the virtual coach. The paper then presents the four prototypes of a senior-friendly virtual learning coach, which were designed to represent different preferences related to the visual appearance, the communication and social interaction styles, and the pedagogical roles. The first evaluation of the virtual coach design was an exploratory, qualitative study, which was carried out in October 2020 with eight seniors aged 64 to 78 and included a range of questions about the preferences of senior learners related to the visual design, gender, age, communication and role. Based on the results of the first evaluation, the design was adapted to the preferences of the senior learners and the new versions of prototypes were created to represent two male and two female options of the virtual coach. The second evaluation followed a quantitative approach with an online questionnaire and was conducted in May 2021 with 41 seniors aged 66 to 93 years. Following three research questions, the survey asked about (1) the intention to use, (2) the perceived characteristics, and (3) the preferred communication/interaction style of the virtual coach, i. e. task-oriented, relationship-oriented, or a mix. This paper follows with the discussion of the results of the design process and ends with conclusions and next steps in the development of the virtual coach including recommendations for further research.

Keywords : virtual learning coach, virtual mentor, pedagogical agent, senior learners, digital literacy, electronic health records

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