

# Developing Educational Computer-assisted Simulations

Exploring a new approach to researching learning in collaborative health care simulation contexts

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## Akademisk avhandling

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### **Abstract**

Health care education is developing and simulations, in different guises, are gaining increasing attention as a means of overcoming tensions between instructional models and educational objectives. The role of simulations is, however, yet to be fully defined and will be dependent on the actual impact simulations on educational practice. Research need to better understand this impact and contribute to developing simulation practices. There is, therefore, a strong need for research that can balance scientific stringency and practical utility. This presents a challenge in a field that is biased in favor of laboratory experiments where theoretical accounts are also rare. This thesis explores a new theoretical and methodological approach, as a means of meeting this challenge. It draws upon Rose Luckin's Ecology of Resources framework for redesigning learning contexts (2010) and it attempts to explore relations between learning context, learner interactions, and learning outcomes, in order to identify opportunities for the development of educational simulation practice. In researching different types of health care simulations in their own right, arguments have been made that it is necessary to strive for smaller and more useful generalizations. In response to this challenge, this thesis delineates one type of simulation context: collaborative educational computer-assisted simulation (ECAS) in health care education. After reviewing previous research on related topics, a model of this type has been developed. Based on this general model, the particular subfield of collaborative radiology in ECAS has been analyzed and researched. Four articles on this topic present empirical contributions that address different relations between context, learner interactions, and learning outcomes in collaborative radiology in ECAS. The first one explores how moving from a static tool to an ECAS changes what learners talk about, how they talk about it, and how they develop during training. The second one explores in more detail relations between the features of ECAS, the content of learner interactions, and the impact on learning. The third one explores how context design impacts peer interaction, and the fourth compares more and less successful groups in order to identify needs and opportunities for development of the learning context. The empirical data are used to discuss relations between learning context, learner interactions, and learning outcomes, and how collaborative scripts may be potentially useful in the development of collaborative ECAS in health care education. Such scripts could support for instance explicit dialogue about relations between context-dependent doing and subject-specific principles, thorough engagement with simulation feedback and inclusion of all simulations participants. A new path for health care simulation research is suggested.

### **Keywords**

education, computer simulation, collaboration, health care, context, design, ecology of resources.

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