

## Chapter 32

# Teaching Group Decision Making Skills to Emergency Managers via Digital Games

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### ABSTRACT

*This chapter discusses how a focus on establishing the appropriate learning outcomes of an educational programme, and creatively incorporating these learning outcomes within the design of a game, can lead to the development of a useful educational game. Specifically, it demonstrates the process involved in generating game design criteria from a multi-disciplinary literature review. The design of a game that has been developed as part of a project to train emergency managers in group decision making and communications skills is presented, along with some initial evaluations of that game design. It appears that the game presented can function as a valid practical element of a programme for the training of group decision making and communication skills with emergency management personnel.*

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## INTRODUCTION

Games have recently been suggested as effective media for delivering educational content and for helping students to reach educational goals (Gee, 2003; Greitzer, Kuchar, & Huston, 2007; Kelly, Howell, Glinert, Holding, Swain, Burrowbridge & Roper, 2007; Pivec & Kearney, 2007). Specifically, the combining of psychological research and games design principles offers a framework for developing educational games that promote learning while maintaining high motivation of the players (Siang & Rao, 2003). Understanding how to create an effective educational programme based on game playing is an inherently multi-disciplinary task, requiring expertise in Pedagogy, Human-Computer Interaction, Psychology and Games Design, in addition to extensive knowledge of the subject domain of interest. The current chapter demonstrates how an understanding of the appropriate learning outcomes of the educational programme, and a strong focus on incorporating these learning outcomes within the game design, can lead to the creation of a useful educational game.

This chapter will deal with games designed with the intent to teach demonstrable and generalisable skills to those who play them. The work presented was carried out as part of the “*Leonardo*” project “*DREAD-ED: Disaster Readiness through Education*” funded by the EU Lifelong Learning Program (see <http://www.dread-ed.eu/>). The chapter will discuss the challenges faced in developing a game to teach group decision-making and communication skills to groups tasked with managing emergency events such as floods, fires, volcanoes and chemical spills. While this is a very specific game design task, it involves considerations common to the design of all educational games and we will make recommendations on best practice regarding these considerations.

The chapter will begin with some background on the task of managing emergencies and will

discuss existing methods for training emergency managers. The opportunities and challenges presented by using computer games to teach relevant skills to emergency managers will then be introduced. We will discuss issues common to all educational game design, such as providing timely and specific feedback to participants and ensuring that the target skill of the educational programme is intrinsic to game play. Challenges specific to the current project, such as the problem of teaching people who are already experts in their domain and that of understanding group decision making behaviour will be presented. A set of design requirements will then be formulated.

We will then present the design of the DREAD-ED game and describe how this design fulfills the outlined design requirements. An evaluation of that game design will then be presented, based on three separate studies, the results of which will be combined here. Conclusions on these studies and the project in general will then be presented. In the final section we will discuss future research directions for the field of educational games, both in terms of soft skills training projects and also more generally. The current chapter provides a valuable contribution to the current book as a detailed case study on how to approach the design and evaluation of a game for a very specific purpose and audience; that of training group decision making skills to emergency managers. It is intended that the approach taken here may be of use not only to those interested in emergency management, but may also serve as an exemplar on how to approach the design of games for very specific purposes in future.

This chapter is an extension of an earlier publication (Linehan, Lawson, Doughty & Kirman, 2009) and presents a more complete description of the design challenges and solutions than was possible in the earlier work. In addition, the third experiment reported here was not included in the earlier paper.

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