

Title	災害ボランティア初心者の倫理的な意思決定スキルの向上を支援するモバイルシリアスゲームに関する研究
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Abstract

Many responses of catastrophic natural disaster did not perform properly to an appropriate standard. This often occurred when first responders were involved—especially inexperienced first responder—did not have the accurate decision making skill. One of the main issues is the lack of regular training to develop such skills. It has been pointed out that exercise of the non-technical abilities, such as decision-making has enormous impact on effective disaster response. However, some researches show that there are difficulties to conduct a live practice for the disaster situation similarly. In addition, the inexperienced disaster first responders cannot receive maximum advantages from live training due to feedback limitation where reflection from actual circumstances.

Serious games (SG) may be a suitable approach to address some of the problems associated with training of disaster responders, because SG could give a real-life experience when the use of environments is impossible to establish and costly (Hulst & Ruijsendaal, 2014). However, one of the main issues associated with SG is lack of empirical evidence supporting the approach. This thesis will primarily concern on the application of SG to train inexperienced disaster first responders skill for making a decision ethically.

First of all, a preliminary survey was conducted to assess the awareness of the ethical decision-making skill of the inexperienced disaster first responders from high school and university organizations in Indonesia. The objective of this survey was to identify some issues in disaster response work, especially to recognize how first disaster responders ware to the ethical aspects that often appeared in disaster situation. To assess the awareness, we adopted six components of moral intensity invented by Jones that reflect the ethical consideration in the disaster setting. However, to confirm the basic criteria of the disaster responders, we firstly interviewed some experts from the official search and rescue (SAR) organization in Indonesia. Based on these preliminary surveys and interviews, a game for training called MAGNITUDE has been designed, which enables the inexperienced disaster first responders to develop their ethical decision making skill at all times during official disaster management training inside and outside of class. The study results show that there is a difference awareness of ethical situation between experienced (Ex) and inexperienced (Ix) participants. The result of statistical analysis found that from six components of moral intensity, the components of Magnitude of Consequence (MC), Concentration of Effect (CE), and Probability of Effect (PE) were provided the significant factors of differences.

I performed the evaluation of MAGNITUDE prototype. The conducted test was to evaluate the game quality at a very crude phase. The objective of this evaluation was to collect opinions from the learning subjects' point of view about the MAGNITUDE development progress in early stage.

I also was performed the second survey to measure of learners' viewpoint to the use of games for training. The aim of the survey is to determine which education level will more suitable to provide the potential of the learning subjects. The survey was conducted by collecting information on general demographics, general computer game playing habits, computer game preferences, motivations for playing computer games, motivations for playing computer games in training contexts, online game playing habits and acceptability of a SG approach training program. The survey results present that the university students were the most prospective learning subjects for MAGNITUDE implementation.

Finally, based on the findings of the survey about students' viewpoint to the use of game for training, I performed the second evaluation of MAGNITUDE. The conducted evaluation aimed to measure the effectiveness of MAGNITUDE. The results show that MAGNITUDE was considerably significant to improve the participants' awareness of the ethical issues. Thus the MAGNITUDE game has a potential opportunity to be used as a training method.

In summary, this thesis provides the original contributions to knowledge in the SG field, especially the fundamental implementation of embedding six components of moral intensity for delivering ethical gameplay in SG. Another originality is the important concept how to examine the learners' engagement to the ethical gameplay by measuring learners' concerns to the game dialog. The thesis also gives a large amount of required empirical evidence of game playing preference and experience, and its relation to the use of serious game for training purposes.

Keywords: Mobile serious game, Inexperience disaster responder, Ethical decision making, Disaster preparedness, Game for Training