The Value of Team-Based Mixed-Reality (TBMR) Games in Higher Education

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ABSTRACT

This paper reports on a conducted study, measuring the perceptions of post-graduate students on the effectiveness of serious games in the classroom. Four games were used (Project Management Exercise, "Winning Margin" Business Simulation, Management of Change and Management of Product Design and Development) with scenarios ranging from product design to project management. The games might be classified as Team-Based Mixed-Reality (TBMR) games. The games were conducted over the period October 2010 to May 2011and the questionnaires conducted during June 2011. The results, from a sample size of 80 of largely international students, indicated a clear ranking of emotions experienced when participating in the games with "Exciting" outweighing "Apprehensive", "Bored" and Indifferent". The majority of students indicated that both "their team winning" and "showing their personal competence" were important to them. However 70% said that working in teams was valuable in itself implying that team-working was a strong element in the conclusion that the games were of value. For all four games, over 60% said that conflict was valuable and over 75% said participating improved their "working in teams" skills. The value of feedback was rated highly, as was improved motivation. Over 60% said that the participation in the games was more useful than lectures on the same topic.

Keywords: Assessment, Education, Games, Learning, Simulation

INTRODUCTION

There has been a growing interest in the use of games and simulations in education in general and in the fields of business and management training in particular. Sara de Freitas writes that educational institutions have invested heavily in technology (de Freitas, 2010 pp 1-2) and that policy makers need to acknowledge how radically learners' relationships with technology are changing and how this impacts on their expectations and experience of learning. Of special interest are collaborative games in which small teams discuss scenarios presented to them and make periodic decisions. These can make use of different resources, ranging from physical

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components to multimedia technology. This study sets out to examine a particular sub-set or *genre* of game which appears to have gained a currency in Higher Educational programmes in certain curricula, in particular Project and Engineering Management at post-graduate level. The games have certain features in common e.g. they simulate a business operation over set time periods, they are team-based, require collaborative decisions and both periodic and terminal feedback is given. This study sets out to gauge the effectiveness of such exercises from the point of view of the participants.

The Warwick Manufacturing Group (WMG) at Warwick University was chosen for this study as it deploys a number of such games in their MSc courses in Programme and Project Management, taken by over 700 students in the academic year 2009-2010, thus allowing the possibility of a large sample of data.

The article is divided into a number of sections, background to educational games, recent findings from literature with an emphasis on the *genre* in question, methodology used in the study, analysis of results, and conclusions.

BACKGROUND

While educational games and simulations have been around since the 1960's there has been a recent increase in their use largely due to improving technology tools and the desire to promote new and more efficient methods of teaching. Learners are becoming active participants in their learning experiences and are shaping their own educational environments (de Freitas, 2010). In parallel with these developments has been the use of technology for electronic-based learning, known variously as flexi-learning, blended learning or distance learning. These emerging facilities depend largely on the effectiveness of both enhanced software and distributed network technology, allowing students remote participation in lectures and interactive discussion.

However these developments, while sharing similar advances in technology, are not synonymous with educational *games* as such. Games go back a long way before the advent of computers, as far as Roman times and further. Clearly these were not always consciously designed to be educational, although arguably they might be classified as such, as they generally have a component of tacit learning. There has been a recent growth of interest in Serious Games which are still entertaining but are primarily designed with education and training in mind (Allen et al., 2009, p28). The educational element can be seen in many currently popular games in the way players develop useful skills e.g. logic as in Chess, the handling of currency as in Monopoly or the competitive bargaining and bidding skills that are introduced in the more complex financial or economic simulations, for example share-dealing scenarios.

Hogue et al. (2010) make the point that serious games and simulations provide a way to facilitate intercultural communications training for business professionals. Groups and teams are the backbone of business collaboration and communication (p. 16). Thus, the team element is seen as being important in the assessment of business-related games in particular.

The use of Games in Higher Education has pre-dated the recent revolution in technology for both social interaction and pedagogy, as team-based educational games have been used quite extensively from the sixties onwards, albeit focussed in certain areas of education e.g. military & defence, business schools and those faculties concerned with business and project management. Sousa and Costa (2011) discuss a market game, the main purpose of which was to develop an aid that may be a valuable tool in teaching business. They state that simulation games have several goals e.g. teaching, research, motivation applications, mind improvement, and training in dangerous situations while avoiding real risk. They further state that it is important to cater for player motivation in the

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