Serious Games Adoption in Corporate Training

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Abstract. Corporate managers are constantly looking for more effective and efficient ways to deliver training to their employees. Traditional classroom methods have been used for a long time. However, in the last decade electronic learning technology has gained in significance. Serious Games are games that educate, train and inform using entertainment principles, creativity, and technology. Serious Games are proven as a learning method for conveying skills on complex tasks by incorporating sound learning and pedagogical principles into their design and structure. Therefore, it is believed that Serious Games have got the potential to be used to meet government or corporate training objectives. However, the awareness and adoption level of serious games by industry is not known.

In this research we designed and conducted a pilot survey among UK-based companies. We used the survey in order to assess the level of awareness and adoption of Serious Games in companies for corporate training. We aim to understand what kinds of skills development Serious Games-based trainings are desired by companies and to know what they perceive the benefits and barriers of using Serious Games are in companies. This paper describes the stages of the design of the survey questionnaire, presents and analyses the results and ends with conclusions and a discussion about the future research work.

Keywords: Serious Games, Innovation Adoption, Awareness, Corporate Training.

1   Introduction

Game-based learning is one of the issues under debate today. A **serious game** is a game designed for a primary purpose other than pure entertainment. Serious games can be applied to a broad spectrum of application areas, e.g. military, government, educational, corporate, and healthcare. Zyda [1] argues that serious games have more than just story, art, and software. It is the addition of *pedagogy* (activities that educate or instruct, thereby imparting knowledge or skill) that makes games serious. However, he also stresses that pedagogy must be subordinate to story and that the entertainment component comes first.

The use of *Serious Games* in *corporate training* is not extensively studied and investigated by researchers. Today's corporate training market is a large industry. Corporations need to train their employees to improve their skills and knowledge. When the learning material is technical or boring, or the learning objectives are difficult, Serious Games can play an important role in training [2]. Serious Games offer a paradigm shift in training as it changes the role of the trainee from passive to active [2].

Serious games have proven to be an important tool in supporting the education and training at schools and universities as well as vocational training in industry [3], but still they are not often in use. In our research we are interested in understanding two key questions - how extensively Serious Games are being used in corporate training and what the level of awareness of serious games for training is. We look at Serious Games as an innovation and try to understand the current organizations' behaviour in terms of the adoption of such new and emerging technology for corporate training. We are interested in understanding the needs and requirements for the use of serious games for training purposes in companies. Also we aim to investigate how the potential adopters will respond to the use of this technology and whether or not it will be adopted on a large scale.

To satisfy these aims a pilot questionnaire survey of 300 companies in the UK was designed and conducted: The sample included the 100 best companies to work for, the 100 most profitable companies and the 100 fastest growing technology companies in the year 2011.

2   Background

One field that is constantly evolved through adoption of new techniques and technologies, especially by incorporation of IT frameworks and techniques is corporate training [4, 5]. Companies spend large amounts of money on employee training. Traditional methods of training turn out to be costly for organizations. Hall and LeCavalier [6] describe some economic advantages of converting their traditional training delivery methods to the use of IT-based methods. Using a blend of Web-based (80 percent) and classroom (20 percent) instruction, Ernst & Young reduced training costs by 35 percent while improving consistency and scalability. Rockwell Collins reduced training expenditures by 40 percent with only a 25 percent conversion rate to Web-based training. Other success stories also exist in addition to generally positive economic benefits. For instance advantages such as convenience, standardized delivery, self-paced learning, and variety of available content, have made IT-based technology a high priority for many corporations [7].

Serious Games, uses IT-based techniques, is allowing corporations to improve their training of employees, both by engaging them more actively and by testing their comprehension of the information conveyed. Games can be used as training tools for basic corporate situations, or they can be tailored for a particular industry. Video games have created more productive workers demographics. Gaming teaches employees to solve problems in a non-traditional way, using trial and error. Gamers also develop marketable business skills. Beck and Wade show that compared to

non-gamers, employees who train with video games are good at "multi-tasking, good at making decisions and evaluating risks, flexible in the face of change and inclined to treat setbacks as chances to try again [9].

3   Methodology

The aim of the survey was to assess the degree of awareness of serious games for training in UK companies and to assess the level of adoption and the barriers to adoption. In this research we seek to ascertain companies' attitudes on the use of Serious Games in corporate training. We anticipated that the awareness level and adoption of Serious Games would be low. Therefore, to pursue our aim we used the *Descriptive Survey method*. A Descriptive Survey [10, 11] is aimed at understanding the relevance and distribution of a phenomenon, which in the case of this research is Serious Games adoption, in a population. Using a Descriptive Survey, we are not aiming for theory building but for gaining some hints for future research, for theory development and refinement.

The survey was conducted by Nottingham University Business School during the months of May and June 2011. The survey questionnaire was posted to a sample of 300 UK-based organizations as compiled by the Sunday Times - a UK weekly newspaper. The companies were mainly small, mid-size and some big workplaces in the UK and categorized as the 100 best companies to work for, the 100 most profitable companies and the 100 fastest growing technology companies. The companies were representing diverse industry sectors such as consumer goods, manufacturing, wholesale or retail, transport, computers and electronics, business services, healthcare and leisure, etc.

The 100 best companies to work for were selected by the Sunday Times mainly based on an organisation's commitment to its most important assets - its workforce. Focusing on employees brings real benefits such as, improved workplace engagement, better staff retention, reduced recruitment costs and greater financial performance. Having a main stress on staff development, the list of 100 best companies to work for can be a good candidate to satisfy the purpose for the survey, which contributes to corporate training. The list of 100 most profitable companies is well respected in the business sector and ranks companies according to their average profits over the last three years. The fastest growing technology companies are ranked as Britain's top one hundred technology companies with the fastest-growing sales over the last three years [12].

The companies were asked to post the response back using an enclosed Freepost envelope. The questionnaires were sent to the "HR Manager" in the companies, rather than the training manager – as small companies may not have training managers.

After receiving the responses back from 11 companies, we calculated the response rate, which resulted in 3%. The response rate is disappointingly small. Further Steps were taken to try to improve the response rate and to understand why the response rate was so low. This was done by telephoning a sample of the non-respondents.
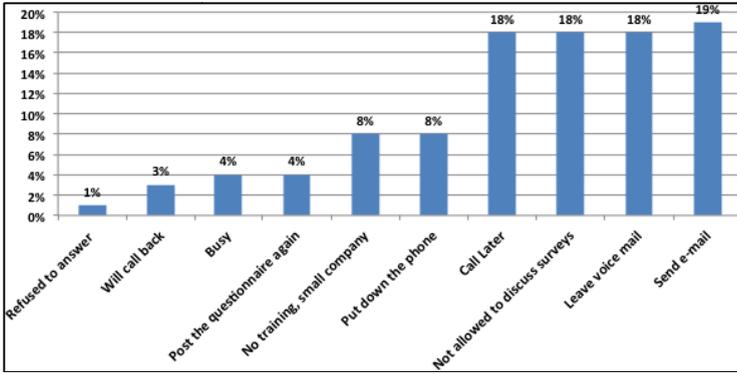
Fig. 1. Reasons given for Negative Reponses (n=190)

To try to improve the response rate for 200 of the companies, the 100 best companies to work for and the 100 fastest growing companies, were contacted by telephone for a follow up conversation and short interview regarding aspects of adoption and awareness of Serious Games for corporate training. It was chosen to contact the companies by phone rather than sending them reminders by post. Making phone calls to companies could allow us to make sure that the interview is directed to the appropriate respondent within the company – the HR manager or the Head of Training.

A considerable number of companies showed a low level of interest to participate in the telephone follow up interviews. A number of reasons were given based on the negative responses given by the company managers, see Figure 1. Almost 20% of the companies asked for sending them follow up e-mails since they were not interested in answering interviews or questions over the phone. 18% of the companies mentioned that they are not legally allowed to discuss surveys over the phone. 18% of the companies referred the interviewee to leave a message on the manager's voice mail for further follow up conversations. Other reasons were given, such as, being busy, being a small company without specific training methods, hanging up the phone and some other reasons were given by the companies in order not to answer the short interview over the phone. Figure 1 presents the reasons given for negative responses. None of the reasons given related to serious games.

3.1 Characteristics of Respondents

According to the survey results, 64% of the respondents were large companies and consequently 36% were SMEs with less than 250 employees. 27% of the companies that responded to the survey belonged to the Business Services sector. Companies belonging to the IT Services sector were 27% of the companies. 18% of the companies that responded to the survey belonged to the Manufacturing Sector and the rest of the companies belonged to the Voluntary, Leisure and Transport Services sector.

We could successfully interview the HR managers of 10 companies or 5% of the companies that we telephoned. Firstly, we asked them to try returning the questionnaire back to us and they were offered to have the questionnaire sent to them again. If they did not wish to complete the questionnaire, the HR managers were interviewed

briefly and were asked if they have ever used Serious Games in their company. They were also asked whether or not they have in-house training and whether they use web-based training methods. According to the interview results, 80% of the respondents mentioned that they do not use Serious Games for training while only 20% mentioned that they use games for training to some extent in their company.

90% of companies use in-house training methods. 10% of the companies outsource all or part of their staff training. 30% of companies use web-based training methods. No company mentioned that they use Serious Games for training, however, after they were explained what Serious Games are, 20% of companies admitted that they have used Serious Games in the form of simulation games to train their staff members.

The overall result was that the response rate to the survey remained low, despite the telephoning of two thirds of the sample. The reasons for this are not clear. It could be that companies have not heard of the term "serious games" and they thus have no interest in completing a survey on the topic.

3.2   Design of the Survey Questions

The first part of the questionnaire seeks to understand the level of awareness of serious games and to compare the company's innovation approach to see if they would be likely to adopt new technologies like serious games. Then the question of the level of adoption is investigated – any or no adoption, test or pilot adoptions or wide scale adoption (we anticipate the latter to be unlikely). Then we examine the barriers to adoption: knowledge/information deficit, practical/ facilities barriers, cost/ business case barriers, low familiarity with electronic training means/ IT, lack of staff, and perception problems (that games are not serious). We then ask what the perceived benefits of serious games are. If companies perceive the benefits to be good they will be more likely to adopt them and conversely.

Finally, we ask about the types of skills that companies want to address using serious games. The question of what types of skill do industry need to be mediated by serious games is key. A question on skills mediated was thus included in the questionnaire. It divides skills into hard and soft skills – hard skills are those associated with knowledge required to carry out one's job, eg. knowledge of the product being manufactured/sold, customer service, project management, etc. Soft skills are those associated with working with other people – team working, communication, interpersonal skills, etc. It has often been pointed out that soft skills are actually very difficult to acquire and develop – in fact more so than hard skills. And it has been further observed that soft skills are more easily mediated by serous games [19].

4   Survey Results

This section focuses on the results of the survey and interpretation of the results.

4.1   Serious Games Awareness

According to our survey almost 29% of companies responded that they have heard about the use of Serious Games for corporate training. However, 15 out of 21

companies have never heard of using Serious Games for corporate training. The results received from the companies indicate a considerable low level of awareness about the use of Serious Games for corporate training among a range of different companies in the UK.

4.2 Serious Games Adoption

The result for the rate of adoption was 10% (one company stated that they used serious games). To ascertain why this might be, we asked about their attitude to adoption of serious games. It might be that companies are risk averse when it comes to the use of new technologies like serious games for training. 60% of the respondents believe that they are *slow adopters,* which means they are cautious in taking up new technology and are only interested in adopting new technology when the market is mature and the benefits are clear. 20% of the respondents say they are *first followers* and they will take the risk of deploying Serious Games relatively early if they are promising. The remaining 20% of the respondents say they are *early adopters* and are willing to use the Serious Games, and taking the risk of unprofitability or uncertainty. According to the responses to the survey, it can be interpreted that there is not much hope for 60% of the companies to adopt Serious Games until a wide scale adoption of Serious Games in industry is seen. The rest of the respondents, 40% of the companies, are either first followers or early adopters. This is a promising outcome and reveals that 40% of the companies are nearly ready to nearly adopt Serious Games. Further investigation is required to understand what would make these two groups of companies adopt Serious Games. Follow up interviews with these companies would be beneficial to understand the requirements for such companies to fully adopt Serious Games.

4.3 Serious Games Adoption/ Use

Regarding Serious Games adoption/ use, most of the respondents (82%) have never investigated their applicability. Only one respondent has already adopted Serious Games in their company to some extent and one other respondent is investigating the possibility of the application of Serious Games for Corporate Training. Both of these companies have mentioned that they have already heard of Serious Games for corporate training. The number of respondents in this survey is not sufficient to analyse the reason for why they have not fully adopted Serious Games for corporate training purposes.

4.4 Use of Different Training Methods

Regarding the investigation about the use of different training methods used in companies, almost 80% of the respondents say that Coaching and Mentoring methods are used in their organization for corporate training purposes. Simulation methods are used by almost 55% of the respondents. This relatively high adoption level of Simulation methods for training can imply that the use of Serious Games for corporate training has got the potential to be more widely used. Similarly, Business Games are also

used at the rate of 30% in organizations. These two responses indicate that there is interest in companies for using simulations and games for training – and hence serious games.

4.5   Application of Serious Games for Skills Training

The questionnaire also focused on understanding in what specific type of skills different companies are interested in using Serious Games. Two business areas of soft skills and hard skills were identified as the basis of the investigation. Hard skills are technical or administrative procedures related to an organization's core business. Hard skills refer to the knowledge about professional theory and skills. These skills are typically easy to observe, quantify and measure. They are also easy to train, because most of the time the skill sets are brand new to the learner and no unlearning is involved. Harrison suggests that hard skills are those relating to the operation of any technology, new or old [20]. Hard skills are those that refer to a set of well-defined skills possible for unambiguous testing. Clearly any technical effort (such as the operation of machinery) falls into this category. The output from such processes based on hard skills can be predicted based on the inputs and the rules. Hard skills have a high knowledge and technical content, and it is essential that an incumbent has achieved a high level of competence in the particular knowledge domain if they are to be allowed to practice the skill [21]. On the other hand, Soft skills represent generic skills that support any discipline, and that can be transmitted to a range of work contexts. Such soft skill competencies represent what is often referred to as emotional intelligence and are predictive of superior performance in work roles. Soft-skills training programmes are usually arranged in groups with intensive involvement of teachers/facilitators for analysing and discussing the demonstrated behaviours of learners. Accordingly such training programmes are quite costly, and there is a consensus that soft skills training is a lifelong affair needing a lot of guided practice. Therefore,serious games show promises for delivering soft-skills training.
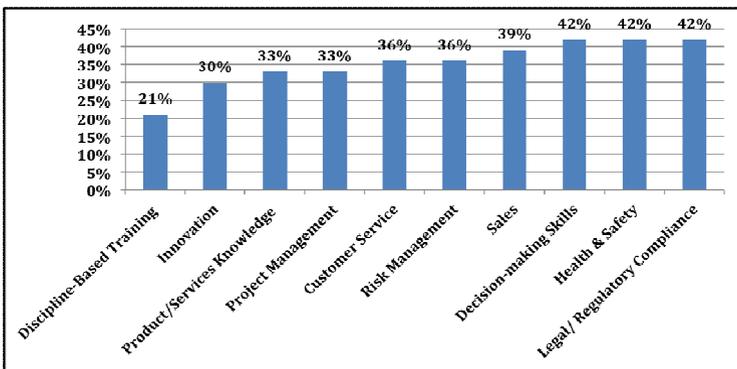

Fig. 2. Interest in Using Serious Games for Hard Skills Training

In terms of hard skills, the respondents are interested at the rate of 42% to use Serious Games for improving the legal compliance, Health and Safety and Decision making Skills. The respondents believe Serious Games can be used the least (21%) for integration with or improvement of Discipline-Based training.

The level of interest in using Serious Games to improve soft skills in companies varies between 36% to 48%, whereas in hard skills the level of interest varies at a lower level of 21% to 42%. The difference between interest levels indicates that potentially Serious Games can improve staff soft skills more compared to hard skills in organizations.
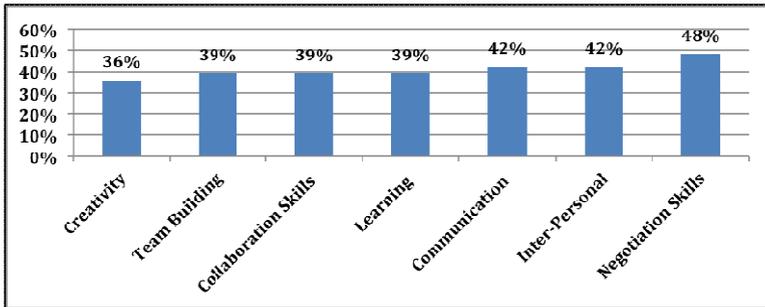

Fig. 3. Interest in Using Serious Games for Soft Skills Training

In terms of soft skills, the respondents show the most interest, at the rate of 48%, in using Serious Games to apply it to Negotiation Skills that they use in their company. The next highest interest is towards the use of Serious Games for developing interpersonal and communication skills at the rate of 42%. Respondents are equally interested at the rate of 39% in using Serious Games for developing learning skills as well as collaboration and team building skills. Serious Games are expected to be used at the lowest level of interest for improving creativity among the staff in companies. Overall the companies show more interest in using Serious Games for developing soft skills rather than for hard skills, with the most interest being in using Serious Games for developing Negotiation Skills.

4.6   Benefits of Using Serious Games

The respondents were asked for their opinion about the benefits that Serious Games can bring into their company. 39% say that they want Serious Games to help the company to be more efficient. The respondents would like Serous Games to improve their staff competence (36%) and become more flexible (30%). This indicates that companies see the benefits of Serious Games to help staff improve their flexibility and competence. It is believed that Serious Games can help at the least level, only 9%, to be helpful for reducing the cost of physical training provision. Reducing training costs also achieved a low rate of 15% according to the analysis of the survey responses. According to the results, reducing the cost of different aspects of training is believed not to be a strong benefit of using Serious Games. This means organizations

do not see cost as a barrier – this could be because they genuinely do not see them as costly or because they are unaware of the cost. Given the low level of Serious Games awareness the latter explanation is more likely, however, interviews with companies would help to clarify this issue.
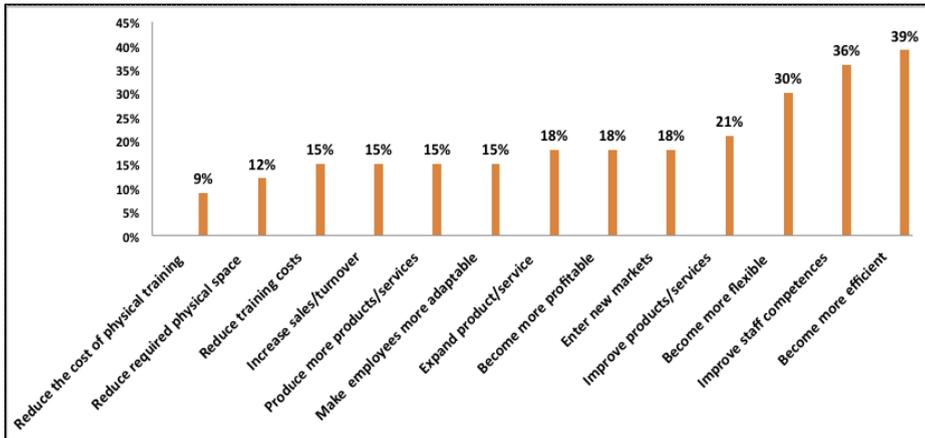

Fig. 4. Perceived Benefits for of using Serious Games in Organizations

4.7   Barriers towards Using the Games

Barriers towards adopting Serious Games in companies are analyzed in five main categories: financial barriers, barriers with familiarity about Serious Games, barriers in terms of the practicality of Serious Games, and finally the level of IT knowledge and support.

According to the results, in terms of financial barriers the majority of respondents, 81%, are not convinced of the business case; and 54% are concerned about the cost as the main financial barrier towards the adoption of Serious Games. 45% of the respondents believe that low familiarity with virtual worlds is a main barrier. This is followed by low familiarity with 3D environments which is agreed by 36% respondents. This means that almost half the companies believe that high technology solutions using 3D/ virtual worlds are a barrier – so lower technology solutions should be proposed. Regarding serious games 27% of the respondents pointed out that not being sure about the reliability of Serous Games was a concern and 27% mentioned that the staff perception about Serous Games training is that it is easy and not seen as valuable. 82% respondents replied that there is not enough known about the practicality of Serous Games use and finally 27% of respondents mentioned that they have problems with the lack of IT support which can be a barrier towards the adoption of Serious Games in their company.

Table 1. Barriers towards using Serious Games

Financial Barriers		Information Barriers	
Unconvinced of the business case	81%	Lack of knowledge (self, company) about Serious Games	63%
Cost of Serious Games	54%	Lack of awareness of the benefits of Serious Games	63%
Difficult to estimate the Return On Investment	36%	Not sure of the reliability of the technology	27%
Unwilling to invest in developing Serious Games	27%	Staff and employee perception that playing games is easy and not valuable	27%
IT Familiarity Barriers		Worries about serious games not satisfying the company's purpose	18%
Low Familiarity with using Virtual Worlds	45%	Not understanding the mechanism in the games that makes them educational	18%
Low Familiarity with using 3D Environments	36%	**Practicality Barriers**	
Low Familiarity with using Web-based Conferencing	27%	Not enough is known about their practical application	72%
Low Familiarity with using Online Training	18%	Lack of good quality information about Serious Games use in training	54%
Low Familiarity with using Skype	18%	Difficulty to measure the learning outcome	45%
Low Familiarity with using Video Conferencing	18%	Not enough time to use serious games in our company	27%
IT Support/Facilities Barriers		It is not easy, or practical, in our business to develop serious games	27%
Lack of IT Support	27%	Lack of training staff who are willing/ experienced in using serious games	18%
Lack of IT/ technical facilities for using serious games	18%	Worries about the integration of Serious Games in to existing training	9%

5 Conclusions and Future Work

This paper has described the research work undertaken on serious games awareness and adoption by companies as part of the GALA network of excellence on Serious Games. The pilot survey described in this paper focused on the assessment of the level of awareness and adoption of Serious Games in a sample of UK based companies for corporate training purposes. The survey was posted to 300 top performing companies. Although, the response rate achieved was low (3%), there are a number of interesting insights that emerged. First, the level of awareness was low – 36%. Second, the level of adoption was very low, 10%. However, 40% of companies are willing to be early adopters or first followers of new technologies and this is promising for serious games adoption.

In terms of the types of training methods in use there is also some promise. Although 80% of companies use coaching/ mentoring, with 60% using traditional classroom-based methods, role play was in use by 45%, simulation by 55%, and business games by 30%. This means companies show a good disposition towards using gaming based methods for training. Companies are more inclined to consider using Serious

Games for soft skills training rather than for hard skills. Companies showed more interest in using Serious Games for improving their employees' negotiation skills, inter-personal skills and communication. For hard skills, the main interests are for legal/regulatory compliance, health and safety and decision-making skills. The main perceived benefits of using Serious Games for corporate training are to help companies become more efficient, to improve staff competencies and to make the company more flexible. Companies do not show much interest in using Serious Games to reduce the cost of training, or to reduce the cost of the physical space required for training, or to reduce the cost of training facilities. The main barriers towards using Serious Games in corporate training were that the companies are not convinced of the business case and then the cost of incorporating Serious Games into their settings.

The response rate achieved for the pilot survey was low. One reason for this could be that the term "serious games" is not well disseminated and established in the Human Resources profession, in industry publications or in corporate settings in general in the UK. The result from the survey showed that more than half of the companies have already used simulation methods, therefore, companies might be already using games for training but not yet learnt the term Serious Games and the definition used. To try to establish this reason future work can be to conduct a survey at a larger scale and posting it to a larger number of companies across a number of European countries to possibly increase the number of responses and the response rate. Further, sending the survey out to members of industry associations (such as training or human resources associations) that are likely to use Serious Games would also be a solution for achieving a higher response rate.

Further study could be carried out in order to understand how to increase the awareness and adoption level of Serious Games as an innovation in companies. According to the survey result 40% of the companies are already willing to take risk of unprofitability or uncertainty of using very latest technology or to deploy new technology relatively early if they are promising. Further research should focus on understanding what criteria need to be taken into consideration and what requirements should be provided in order for these groups of companies to adopt Serious Games in their companies. Further research can be carried out to compare the level of adoption of serious games and e-learning technologies. We would expect the adoption of elearning to be higher as it has been around for more than a decade and has become fairly well standardised as a training approach. The comparison could help to understand the required stages that organizations need to go through to adopt Serious Games and use them in practice for corporate training purposes. Future work can focus on using case studies and interviewing managers in companies, who already have used Serious Games in their corporate settings. This could help to understand how they became aware of, and how, they adopted Serious Games and what factors motivated them.

Obviously users, technology and the market are constantly in a process of change. Users lack infrastructures depending on their needs at each period of time, therefore user requirements are constantly changing and users follow the change in technology to satisfy their requirements. Marketing for serious games strategies should be focused on the changing needs of the users and the change of technology to respond to

evolving developments. Desktop learning, mobile learning and social gaming (eg. Farmville) have increased in significance in recent years. Technology providers and serious game researchers need to work on these emerging techniques to develop compelling serious games that can be delivered anywhere, anytime, anyhow. Understanding the serious game value and researching into how it should be managed to satisfy both users (companies) and technology (Serious Games) providers, is part of the GALA serious games network mandate and will direct the research in the future.

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