

# Where Academics Meet the Real World: Difficulties Encountered When Conducting a Project for Designing a Game-Based Learning in a Company

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**Abstract.** Educational games have been widely developed and tested by many researchers. Most of results show that the educational games are good to increase students' learning motivations in formal learning. It seems quite workable, however, is it also true if we want to apply the concepts to business? Or, does it still have effects to on-job-training and orientation in business? This research focuses on the first question. The experience of trying to design and test a Game-Based Learning System, with a joy component, in a real corporation is challenging and risky. This paper shows how hard was to find a company willing to do this test, the negotiations involved, the legal issues and the extensive scrutiny imposed. Constant revisions and postponing, threatening of cancellation and misinformation about company resources needs continuous diplomacy and flexibility from researchers. Prejudice against computer games may play an important barrier and an unfair advantage towards traditional training deliveries.

**Keywords:** game-learning learning, training, joy, computer game, educational games.

## 1 Introduction

According to Vossen's research in 2004, three attributes are used to analyze game category, are competitive, interactive, and physical [16]. The game features attract players are fantasy, curiosity, challenge and control [8]. Some researchers point out that playing can hold student attentions and make learning be more interesting [15][2]. For this reason, many studies use commercial games directly or design new education games and have evidences of students can get significant improvement in learning [15][11][1][13].

Several studies have been carried out on game-based learning with an educational orientation, especially for a possible use in either helping learning the traditional classroom environment, or supporting teaching activities [5], with improving techniques like the multi level challenge system [4]. Other game-based learning systems were, for examples, VISOLE [10], AnswerMatching [17], Shadow Box [12], and Simulation Fish Tank [14].

This decade has brought significant technological improvements to enable a level of precision for game-based learning tools, never experienced before, like the Lego Mindstorms [7] and other learning toys [6][9]. Capps et al. (2001), explained how the

Department of Defence has been focussing in collaboration with the entertainment industry, in order to try to cope with the same agile pace of the industry, but taking advantage of the technology and even a postgraduate naval department was successfully created [3][18].

The objective of this paper is to inform researchers of the hard reality of conducting real life studies about game-learning in companies. Even if some company employees may open the doors to game-learning studies, researchers still have other barriers to work on.

This paper is organized into five sections, the four remainder parts of this paper exposes the process of looking for a company willing to allow the research to be done with their employees, then the project management, followed by the unexpected ending and the conclusions.

## 2 Finding a Collaborative Company

The process of recruiting a company willing to allow its employees to participate in an academic empiric research is not an easy task, when the subject of the study is Game-Learning. Armed with a mini-proposal and a sales plan explaining the benefits for an organization to help out with an academic study was not enough. The word *game* represents a major road blocker, even after carefully explaining factual information regarding peer review studies showing game-learning systems as a powerful and effective learning tool.

Considering the final objective was to create, design and test the learning effectiveness of a game for training purposes, in an enterprise-like environment, and analyse the learning process, engagement, and knowledge retention compared to the conventional training currently in practice, the path chosen was to adapt a current training from a company to a board game format, where the addition of joy while learning, would improve learning results and user experience. The proposal to the company would be to develop this game based on a current training material and test it among their employees. The test results would be shared with the company, as well as the game would be used by the company at any time.

Once it is understood a company will have training needs at specific dates, for specific individuals, at specific locations, it is important to consider being flexible enough, in order to match research deadlines to corporate needs. These facts lead to searching for the corporate partner as soon as enrolled in the respective course, at University, as negotiating deadlines and major deliverables could take a long time.

When already working for a company, it is natural to search for shelter within your own roof. The first approach was to contact D-Company, the current employer. Follow the protocol, contact your boss first, who in this case was a director and a game fan: he immediately sent an e-mail to one of the Human Resources Vice Presidents, who oversees training.

The Vice President forwarded the message to a human resources employee, who was quite resistant to the idea of having any test done with gaming and after a few tries, it was very clear there was going to be no cooperation. The next step was to

climb one corporate ladder step and talk to the Training Manager, who was very positive and opened to the study, collaborating with ideas and example of online games.

A couple of months later, after researching about Adobe Flash, and ready to start developing the game, several attempts to contact this manager were tried, unsuccessfully. E-mails were sent and voice mails left. Only after a couple of weeks, the manager returned the e-mail mentioning they had no more budget and therefore, the company could not go ahead with the training anymore. After inquiring about other possibilities of training with other companies from the same group, she facilitated the contact with another manager in the United Kingdom, at the head office of the parent company. This manager worked with Corporate Responsibility and she had developed a board game for *business principles* to train remote employees. However, the training had already been done and there were no more plans for another one and attempts to still try to do the research at D-Company, end at this point. Table 1 shows the contact flow at D-Company.

**Table 1.** Contact flow for D-Company

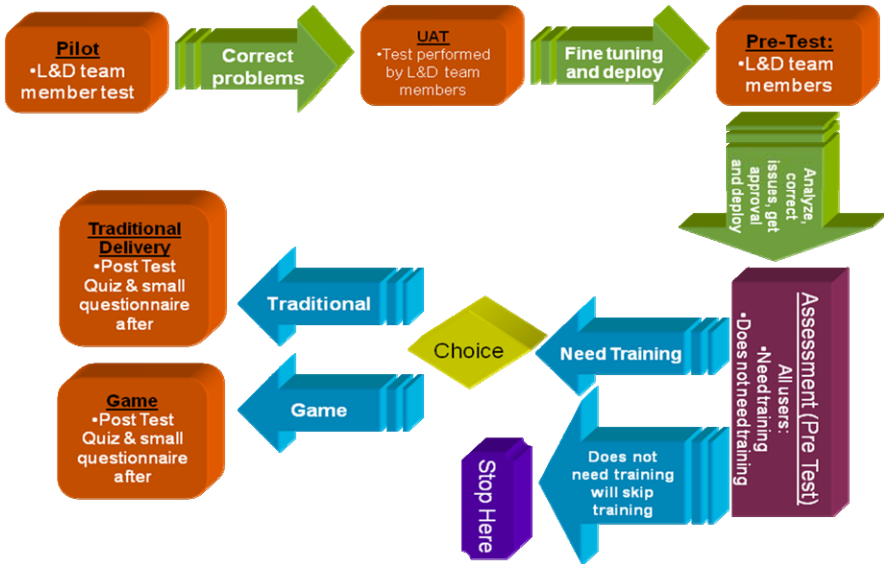
Contact Type	Level	Outcome
Boss	Director	positive
VP HR	VP	positive
HR Consultant	Manager	negative
Manager Training	Manager	negative
Manager Corporate Responsibility	Manager	negative

At R-Company the first contact was done through the Design Manager, a Human Resources department in charge of training. Networking made the accessibility flow better. In this case, the contact person was also directly in charge of developing training and again, in a management position.

The initial contact, over the phone, was done in November 2008 and the concept of game-learning was perceived as positive and the process moved to a company internal exploration phase, where the manager was trying to find departments willing to experiment game-learning and assign a training to it. During this process, a brief benefit analysis was sent to the manager, as per one of her director's request which were sent based on these 5 points: experts advisory to R-Company (peer review), exposure and advertisement (Conference papers), possibly new training delivery format, empiric research and low, or no cost to the company.

Fig. 1 shows the flow chart sent to the manager, so she could make use of a visual tool when presenting the project to R-Company executives.

At this time, a written agreement was sent to the manager, signed by the researchers and to be signed by the company. This agreement was sent to the company lawyers for review, which took 6 weeks to be signed, after several changes made to the original document, and dozens of e-mails exchanged between the parties. It was also necessary to sign an NDA – Non Disclosure Agreement, at that time.



**Fig. 1.** Flow chart of the project at R-Company. This chart was sent to the manager in order to help selling the idea of the project to upper management.

### 3 Project Management and Corporate Diplomacy

No matter how important your project may be for humanity, corporate decisions will take its own course. It is up to you to manage the project the best way you can. There will be several and unexpected issues along the road and negotiation and diplomatic skills will play decisive role in the survival of your project.

From the agreement signed with R-Company, the training selected to be part of this research was the watercraft training. The initial number of employees targeted for the project was around 600, from which about 240 would have to undergo the w-craft training. These 240 would chose between the traditional online training and the game-learning module. Every single statement within this paragraph has been at stake, several times along the process. The training itself has been called off and then back again. The design manager played an important role interacting with the different departments.

The departments holding the w-craft training to its employees are basically sales oriented. If the sales targets are not being met, or if the heads of these departments decide to take any tactic, or strategic decision regarding how to better use their employees time, between taking the w-craft training for one hour, or using this time to do something else, is out of the researcher control.

Positive attitude in showing how the project would impact in helping the company was the only counter measure for the downfalls the company presented during the whole interaction with us.

Diplomacy played at its most joyful is the best advice when facing the nervous breakdown point employees in a company. While in the process of developing the

game, it was inevitable to face the company design team worried about the outcome and the process itself. Several change requests were made and they had to be negotiated and sometimes modified, or even implemented, reviewed, and modified again, until they were happy with the outcome.

The initial prototype was quite different from the final version of the game, basically due to the several changes initiated by the company. The involved employees take the project as something produced by their own department, and not an academic project. It was quite usual to receive a request to modify something related to the game, and not the training content itself. Unquestionably, the best approach was to always show the different scenarios and explain the pros and cons. If not able to convince them, the solution was to incorporate the change and try to work around it as best as possible, which was time consuming, but the only way to try to change the situation on a reasonable way. The same way, after several threats of not going ahead with the research, the efforts switched to the development of the Flash game, improving the questionnaire for the participants to measure how likely they were to adopt the game, to deploy the swf file into the University server and make sure it would work flawless, which means perform all the tests at R-Company, and not when and how many people would take part of the experiment, neither if it would even happen.

To orchestrate the company and University timelines is another extremely important task. To keep the parts involved aware of changes is key to manage this process, however it is part of the negotiation and diplomatic skills mentioned above to keep all the parties away from a panic situation.

Right after receiving the okay from upper management on January 22<sup>nd</sup>, 2009 and signing the agreement, the manager emailed the pre- and post-test questions. The content was sent about a week later, on January 23<sup>rd</sup>.

The first step was to review the documents and understand and master the content. Several messages were exchanged with the company to clarify points in the content. At the same time, the process of creating the game had already started.

February 27<sup>th</sup> or almost one month later, the prototype of the game was ready and a meeting was carried out at the company, with the design manager and the development officer in charge of this training module. Initially, it was difficult to get any consensus from the meeting. Instead of focusing on the learning content, both the manager and the officer were more worried about the game itself. Although input is extremely healthy at the development phase, it has to be constructive and avoid threatening of not launching the game, or stating the head of the target departments would not approve it, but this is how the meeting was. At this point, the manager cognitive resonance process in order started to justify how the changes they requested were going to make the experiment results lean towards the game, improving the score of game participants.

Right after the meeting the manager sent an e-mail with a list of required modifications to the game. After advising it would not be possible to meet the deadline to have the game in the company training Intranet site if all the modifications had to be implemented, the manager and the officer decided for hosting the game at the University's website and having a link posted in the company's Intranet. This arrangement extended the development phase to another 4 weeks, especially due to another bumping on the training start date, which was moved to March 24<sup>th</sup>.

These 4 weeks were extremely intense. 40 e-mails and several telephone calls were exchanged during this time. The officer revised the content 4 times. The experiment questionnaire was sent for review, but came back as the format the manager and the officer thought it would be fine for setting up at their training application could not be done, or the answers would count as official marks for the participants. The questionnaire had to be changed and the officer revised it 4 times, until acceptance.

The game was ready by March 23<sup>rd</sup> and approved by the officer, who mentioned he was quite happy with the outcome.

## 4 Unexpected Ending

Once the game was being tested, some follow up calls and messages had been exchanged and everything was fine. When inquired about the number of people logging into the game, the officer mentioned it could not be captured. At this point there was another corporate challenge, but this time, with the University: as the game was hosted at the University server, a request was sent to the administrators in order to retrieve the hits to the specific swf file containing the game. Larger servers as the ones used by Universities do have web statistics capabilities and it is possible to retrieve this information. However, after 3 attempts, no answer to this request has been provided.

One day after the end of the training, which was April 1<sup>st</sup>, the results started to come: 32 participants. As the initial estimate of employees taking the training was around 240, another set of e-mails started to be exchanged. Only after a phone call it was possible to understand why only a fraction of the participants took the training: it was offered to 80 participants only. From these 80, 48 passed the pre-test and did not need to do the training. Although it was unexpected that such a small amount of people would do this module, at least it was a real world project, which would show the results based on real life experience.

From the 80 employees in the department, 32 completed the training. From these 32, 23 responded the questionnaire. From these 23, 2 answers will have to be discharged, as the score is clearly incorrect: they show a score of 8, and 9, which is way too low compared to the rest of the answers (between 45 and 100).

## 5 Conclusions

The conclusion of the project itself is not the scope of this paper and will be presented in the thesis document. What is important to highlight is the impact of the procedures from a company in a real life experiment. Deadlines overstretched, development process convoluted and outcome unexpected. The results cannot be seen as bad, but certainly absolutely interesting from the scientific point of view, as the environment affected the course of science.

A clear recommendation for anyone who is planning to carry on a similar approach of real life research in a corporation would be to try to nail down the details in the agreement and to have all the chain of sponsors and major stakeholders sign off the document, as a project management document. A project management rigid guideline

would possibly avoid the deviations from the initial proposal and keep the focus of all the departments in their deliverables, but not in the creative process of the game.

## References

1. Anderson, T.A.F., Reynolds, B.L., Yeh, X.P., Huang, G.Z.: Video Games in the English as a Foreign Language Classroom. In: 2nd IEEE International Conference on Digital Games and Intelligent Toys Based Education, pp. 188–192. IEEE Press, Banff (2008)
2. Boyle, T.: Design for multimedia learning. Prentice Hall, London (1997)
3. Caaps, M., McDowell, P., Zyda, M.: A future for entertainment-defense research collaboration. *IEEE Computer Graphics and Applications Journal* 21(1), 37–43 (2001)
4. Cheng, H.N.-H., Deng, Y.-C., Chang, S.-B., Chan, T.-W.: Design of Multi-level Challenges of a Digital Classroom Game. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 11–18 (2007)
5. Hsiao, H.-C.: A Brief Review of Digital Games and Learning. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 124–129 (2007)
6. Hsu, S.-H., Chou, C.-Y., Chen, F.-C., Wang, Y.-K., Chan, T.-W.: An investigation of the difference between robot and virtual learning companions' influences on student engagement. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 41–48 (2007)
7. Jormanainen, I., Zhang, Y., Kinshuk, Sutinen, E.: Pedagogical Agents for Teacher Intervention in Educational Robotics Classes: Implementation Issues. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 49–56 (2007)
8. Pivec, M., Dziabenko, O., Schinnerl, I.: Aspects of Game- Based Learning. In: 3rd International Conference on Knowledge Management, Graz, Austria, pp. 216–225 (2003)
9. Schweikardt, E., Gross, M.D.: A Brief Survey of Distributed Computational Toys. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 57–64 (2007)
10. Shang, J., Jong, M.S.-Y., Lee, F.-L., Lee, J.H.-M.: A Pilot Study on Virtual Interactive Student-Oriented Learning Environment. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 65–72 (2007)
11. Steinman, R.A., Blastos, M.T.: A trading-card game teaching about host defence. *J. Medical Education* 32, 1201–1208 (2002)
12. Sung, J.-Y., Levisohn, A., Song, J.-W., Tomassetti, B., Mazalek, A.: Shadow Box: an interactive learning toy for children. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 206–208 (2007)
13. Šisler, V., Brom, C.: Designing an Educational Game: Case Study of 'Europe 2045'. In: Pan, Z., et al. (eds.) *Transactions on Edutainment I. LNCS*, vol. 5080, pp. 1–16. Springer, Heidelberg (2008)

14. Tan, J., Biswas, G.: Simulation-Based Game Learning Environments: Building and Sustaining a Fish Tank. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 73–80 (2007)
15. Virvou, M., Katsionis, G., Manos, K.: Combining Software Games with Education: Evaluation of its Educational Effectiveness. *Educational Technology & Society* 8(2), 54–65 (2005)
16. Vossen, D.P.: The Nature and Classification of Games. *Avante* 10(1), 53–68 (2004)
17. Wu, W.M.-C., Cheng, H.N.-H., Chiang, M.-C., Deng, Y.-C., Chou, C.-Y., Tsai, C.-C., Chan, T.-W.: AnswerMatching: A Competitive Learning Game with Uneven Chance Tactic. In: The Proceedings of the First IEEE International Workshop on Digital Game and Intelligent Toy Enhanced Learning (DIGITEL 2007), Jhongli, Taiwan, March 26-28, pp. 89–98 (2007)
18. Zyda, M.: Directions in Modeling, Virtual Environments and Simulation (MOVES). In: The Proceedings of the IEEE Virtual Reality Conference (VR 1999), Houston, Texas, USA, March 13-17, p. 71 (1999)