Play and Learn 3D (PAL3D®)

A Collaborative Way of Learning Project Management with Minecraft®

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Abstract— **Play and Learn 3D is an effective way for people to learn about Project Management (PM) and develop managerial skills with a team under "extreme" circumstances. Users of this program can plan a project in teams, calculate budget and time requirements, introduce this data in our app and play Minecraft® on our server. The app and server are connected so the student will always know the impact of their performance and will introduce corrective measures if required, with consensus from the team. Teachers can analyze their learning patterns and infer behavioral models. (Disclaimer: Minecraft® is a trademark of Mojang Synergies AB. and has not participated either in the conceptualization or in the development of this course methodology or in the course itself).**

Index Terms—**Project Management, play and learn, collaborative learning, PAL 3D**

I. INTRODUCTION: ORIGIN AND EVOLUTION OF THE IDEA

A. First Steps

We discovered Minecraft® accidentally, inevitably, through our children. After playing with our children and dying too many times we realized that we must plan our next interaction with the game in order to survive. As I own a project management training company and am a trainer myself, I was inspired! I have a project each time I enter Minecraft® but, was there a chance to use it in our trainings? In June 2015 we shared our thoughts on LinkedIn and generated a healthy debate which showed us that teaching Project Management with a game like Minecraft® was, at least, appealing and useful.

We chose Minecraft® mainly because it is a 'sandbox' game, which means that each player crafts their own future manipulating the specific terrain and habitat provided in the game. But what really attracted us was that apart form a single player option, Minecraft® could be played with multiple players.

Further investigation helped us discover that this game also let us work on specific knowledge areas of a project: there are numerous situations when you have to handle risk and properly manage it, for example, when you have to deal with hostile creatures which can injure or damage you; time management is also an important skill in the game since during the day you have to organize acquiring weapons or a shelter in order to survive the night; scope management or even quality management could also be variables included in the game.

B. Initial Concerns and Constraints

1) Our Game Had to be Collaborative

Being collaborative in Project Management means that apart from theoretical content we can work on skills like: handling stress, leadership, team roles, and stakeholder management. This was not a game to play but to play collaboratively.

At a certain point in the course, students gather both offline and online. This helps them put into practice much more than what they expect, becoming real members of a project and reproducing the micro cosmos of a project with member roles, decision making processes, rules, and different leadership styles.

2) Students' Interactions with the Game had to be Traceable

The course had to show the students the impact of their decisions, and we had to be able to measure their interactions with the game. Without measuring the progress of each student Minecraft® was just a "game" and we wanted it to be a Project Management experience.

Defining the variables to be measured implied a sound knowledge of the game and of the infinite chances of interaction. Once programmers and methodologists understood the logic behind the game, we could produce a "construction map" and define which variables we wanted to be measured. In order to trace these variables, we first tried with Minecraft® Realms but finally decided to use Sponge which lets the system "know" which actions are being taken by each student.

In order to make all calculations according to the information provided by Sponge we developed an app where all stats of the game appear individually and by teams.

3) Online / Blended Based

Certificacionpm®, my thirteen-year-old company is focused on online training and we have developed a campus for teaching Project Management, Risk Management, Scrum, PMP, and CAPM. We are strong in technology and can infer certain learning patterns. We could not miss all this expertise.

As a result, our first course was 100% online. It was meant for people from all over the world working in coordination and at some moments simultaneously. After some test groups we realized that this was a strong methodology which recreated a real-world working scenario where team members had to face communication issues, technology limitations, and cultural and timing gaps. The use of online project follow-up boards like Trello and Asana was suggested by some members of these remote teams. This experience helped to transcend the game.

As some teams preferred to physically gather at some point in the process, we shaped the online methodology and made it a blended one. It let us introduce physical cards and gadgets which resulted in an ideal project planning process. The best of both approaches combined resulted in a perfect match.

C. Road Map

June 2015 - March 2016. Research work. After initial ideas, we started reading about the use of Minecraft® for educational purposes. All the literature we read was about Minecraft® for children, and nothing specifically focused on adults. In fact, the Minecraft® pedagogical approaches to teaching were not something new, but the methodology we had in mind was new: it had to do with an engaging experience for adults who could learn collaboratively about Project Management and assess the learning impact.

In order to test our idea, to see if it generated curiosity and if a market for the project existed, we started sharing our thoughts on this course and gathering online feedback, as well as feedback from clients and colleagues.

March 2016. Prototype. Basic prototype was developed: software, native application, course server and course content.

June 2016. Beta testing May. We tested the idea at the Northwest Startup Day (Galicia) with an overwhelming reaction from attendants to become testers of the product. We also tested the product with a team of eight people with different backgrounds, ages, and experiences. We came to the conclusion that the student's main concern when attending a gamified course is to learn over playing. This drove us to strengthen the theoretical part of the course and increase its level of difficulty. Testing was crucial.

July 2016. Minimum Viable Product (MVP). We launched the course at the University of Zamora in its Masters in Project Management. We found a group of enthusiastic students and experts in Management, who could put into practice what they had learned. The collaborative part and the stress on soft skills was a good complementary activity for the Masters. The competitive part of the game proved very motivating for the teams. We decided to include a gift for winners as part of the process.

June 2017. Final product V.1. Testing with the corporate sector. We presented the product to Heads of the Human Resources Department of eight Corporations.

They learned, played and provided us with great feedback in order to tailor the courses to their departments.

July 2018. Final product V.2. 2nd training at the University of Zamora in its Masters in Project Management. We had introduced some lessons learned from previous sessions and students saw the real application of the game.

October 2018. Final product V.3. The training and corporate sector are demanding this type of training. Each new training lets us grow the product. We are eager to see what the future brings.

II. FACTS

A. Product Audience

We are focused on training adults specifically in the discipline of Project Management. Our target age is between twenty-five and forty-five years old. This condition made it possible that this may be the students first contact not only with Project Management but also with the game. The game is a tool in this course and the student has to see it as such. We worked on all materials in order to avoid frustrating situations. Students are used to basic Project Management concepts and also to basic Minecraft® commands sequentially, step by step.

By adults we mean both students and professionals who want to learn about Project Management and managerial skills: stress, team building, decisions making, etc.

Apart from the course participants, we also saw that this course could be a great asset for Human Resources Departments who want to analyze leadership styles, or work on specific aspects of their profession: conflict resolution, ethics, roles, etc. This information could prove helpful in developing professional paths.

B. Product Goals

Basic goals of this course are related to professional goals of participants and also those of HR departments.

For the professionals the course helps them become aware of their role in a team, their leadership style, aids in learning managerial and project management concepts, and how to develop a collaborative way of approaching a problem.

For training HR departments the course can provide tools that help analyze team performance and any soft skills related aspects. The course also helps in teaching collaboration and team building skills.

III. OVERVIEW OF THE PRODUCT

This course runs in 3 scenarios:

A. First Scenario: Online Campus on Certificacionpm®

By means of four mini-adventures the students would not only learn how to cope with Minecraft® but they would acquire a deep PM knowledge. This is an online self-study/practice moment.
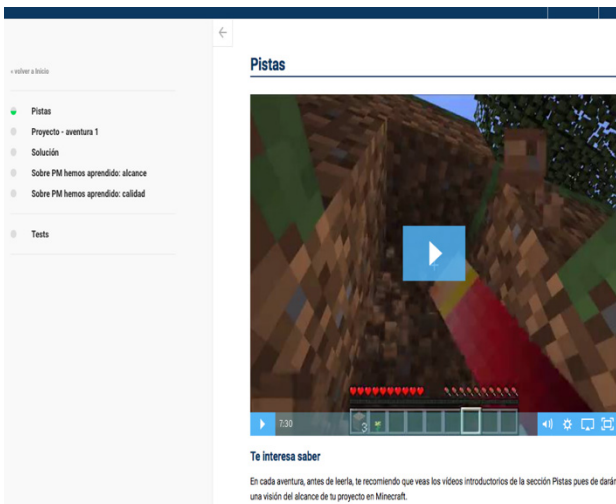
Figure 1. Snapshot Certificacionpm® campus

B. Second Scenario: In Class, Off Line, for Planning Purposes

Each group receives instructions about what they have to build in Minecraft®. They receive a folder with visual resources and aids in order to build a hut, or small house. With this information they will conclude how much money the project will cost and how long it will take. They will upload the information to The Minehut Project App, developed by ourselves.
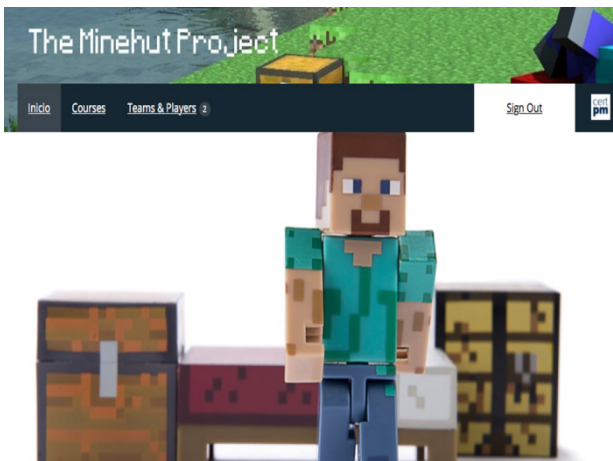

Figure 2. Snapshot. Certificacionpm®, Minehut Project App

C. Third Scenario: In Class, Online, Executing the Project in our Minecraft® Server

All students enter our Minecraft® server, find their team members and start building according to their planning, and what is really worth all the pedagogical and technological development: as the Minehut application and the Minecraft® server are connected students can see in the Minehut application various graphs showing them how they are performing against what was planned. The Earned Value Analysis is so useful in PM control and will aid in controlling their performance and introduce corrective measures when needed.

IV. CONCLUSIONS

With over 16.5 million Project Managers in the world and more than 75 million Minecraft® active users a month, the course had to welcome all profiles, from novice to experts, for both project managers and gamers. None of them had to feel frustrated because of the high level of the course, or discouraged because of a low learning ceiling. We are happy to say that the course welcomes all profiles, all of them will learn project management high level concepts, experience them, and have a good time.

The course becomes collaborative the moment the students have a common goal which implies not only socializing but sharing their knowledge and creating a common understanding of the project. The game helps in this path, providing a common ground to evolve as a group.

The final lessons are learned when students and facilitator share their experience, and is essential for all to be aware of their progress in the field of management and behavioral patterns.

AUTHORS

Claudia Alcelay is CEO and Founder of certificacionpm®, Project Management Training School. She is in the Advisory Board of the Project Management Institute (PMI) at the Madrid Spain Chapter and she has been its former President. She is working with the European Commission in the PM2 certification translation. She is a well-known speaker and PM writer, helping Universities and Business Schools in the development of their programs. (claudia@certificacionpm.com)