



## A social gamification framework for a K-6 learning platform

Jorge Simões<sup>a</sup>, Rebeca Díaz Redondo<sup>b,\*</sup>, Ana Fernández Vilas<sup>b</sup>

<sup>a</sup> Instituto Superior Politécnico Gaya, Portugal

<sup>b</sup> Escuela de Ingeniería de Telecomunicación. University of Vigo, Spain

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### ABSTRACT

As video games, particularly, social games are growing in popularity and number of users, there has been an increasing interest in its potential as innovative teaching tools. Gamification is a new concept intending to use elements from video games in non-game applications. Education is an area with high potential for application of this concept since it seeks to promote people's motivation and engagement. The research in progress will try to find how to apply social gamification in education, testing and validating the results of that application. To fulfil these objectives, this paper presents the guidelines and main features of a social gamification framework to be applied in an existent K-6 social learning environment.

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### 1. Introduction

The use of video games as learning tools, known as Game-Based Learning (GBL), has been gaining prominence in recent decades. GBL has assumed greater interest since the beginning of the century with the Internet and the World Wide Web and, more recently, with the paradigm of Web 2.0 and social networks. This recent changes in Information and Communication Technologies (ICTs) has also made changes in society, influencing the way people relate, communicate, work and learn. Video games are popular among younger generations, designated by some as “digital natives” (Prensky, 2001). For them, all these technologies always existed and are used as something that was always part of their lives (Johnson, Smith, Willis, Levine, & Haywood, 2011). But they have become disengaged with school with consequences on their levels of motivation, which affected their learning outcomes.

#### 1.1. Video game industry

The video game industry is growing rapidly and become mainstream entertainment. Videogames are no longer just software applications running on a personal computer, with a single user using a mouse and a keyboard, nor games installed on dedicated equipments such as game consoles. The developments in the computational and graphical capabilities of computer hardware contributed decisively to the evolution of the video game industry. Videogames also took advantage of other technological develop-

ments to become more enjoyable fostering user experience: the ability to play online with broadband and wireless networks; the use of smartphones and tablets as new delivery platforms; the introduction of mixed reality technologies, especially augmented reality; enhanced user interfaces in game consoles with new ways of interacting with the players, like natural gestures.

All of these technological developments lead to new and more enriching gaming experiences. MMOGs (Massive Multiplayer Online Games), like *World of Warcraft*, online social games, like *Farmville*, mobile games in smartphones and tablets, like *Angry Birds*, have an increasingly number of users of all ages, genres and ethnical and cultural backgrounds. All these different users spend a great amount of hours playing these games, using smartphones, personal computers or game consoles. Social games in particular have become very popular among social networks' users. The number social gamers has grown significantly in recent years and most of them use mobile devices to access these games. Many of these gamers are digital-game natives, people that have grown up playing games (Zyda, 2005).

#### 1.2. Learning with games

The potential of using video games in learning was highlighted, among others, by Prensky (2001) and Gee (2003). Gee described the impact of game play on cognitive development and identified 36 learning principles that could be found in video games. Along with the increasing popularity of video games, a movement arose to defend the extension and application of elements normally present in video games to the real world and in areas very far from video games and entertainment. Games to prevent the world hunger or to improve the quality of life of people with incurable diseases are some examples (McGonigal, 2011). This movement,

\* Corresponding author. Address: Escuela de Ingeniería de Telecomunicación (s/n), Campus Universitario de Vigo, 36310 Vigo, Pontevedra, Spain. Tel.: +34 986 813469; fax: +34 986 812116.

E-mail addresses: [jsimoes@ispgaya.pt](mailto:jsimoes@ispgaya.pt) (J. Simões), [rebeca@det.uvigo.es](mailto:rebeca@det.uvigo.es) (R.D. Redondo), [avilas@det.uvigo.es](mailto:avilas@det.uvigo.es) (A.F. Vilas).

known as *Serious Games*, is concerned with video games that have a learning objective (Ulicsak & Wright, 2010). Using games, leisure and serious, in schools to enhance and support learning has become known as Game-Based Learning.

### 1.3. Gamification: a new trend

From 2010, a new trend, designated by gamification, emerged. Gamification applies elements associated with video games (game mechanics and game dynamics) in non-game applications. It aims to increase people's engagement and to promote certain behaviors. In 2011, Deterding et al. (2011) defined gamification as the use of game design elements, characteristic for games, in non-game contexts. Although the concept has been explored primarily in the marketing area, the potential of its application has been extended to other areas such as Health, Environment, Government or Education. Regarding the game elements, which are used for gamification, social elements are a very remarkable category (Zichermann, 2011), especially to the generation of people who share their everyday in social networks. In fact, various features are common to both social games and gamification: user loyalty, achievements (e.g. points, virtual currency, levels, etc.), recruiting users from a user's social network, etc.

### 1.4. Using game elements in a social learning environment

With the research project, presented in this paper, it is intended to find the distinctive characteristics of good games, particularly social games, in order to understand what makes sense to apply in teaching processes. This work is supported by a social learning on-line platform. This platform, schoooooos.com (a.k.a in Portugal as escolinhas.pt), is a collaborative and social learning environment, developed and validated in several Portuguese schools (Simões and Aguiar, 2011). It applies to students from 6 up to 12 years old (K-6). Schoooooos.com, enhanced with selected social gamification features, available as tools in the platform, will be used for field tests. The on-going work should provide a framework, within this platform, with a set of tools to allow a teacher to "social gamify" her/his lessons. This social gamification framework will be later tested in real classroom scenarios to obtain empirical data on the actual effects of the gamified processes. In this paper, social gamification is seen as a subset of the wider concept of gamification: the use of elements from social games in non-game applications. Examples of social games' elements can be found in Järvinen, 2009.

In order to identify features that made a good social game, it will be used a project under development in association with schoooooos.com. This project, Boobo World (Ribeiro et al., 2011) is a MMOG designed to teach programming concepts to children and also a social network, fulfilling most of the features of social games.

This work was motivated by the following research questions: "how can social gamification help educators and schools to motivate students?" and "how effective is the use of social gamification in education?" This article proposes the guidelines for a framework to endorse the first question. The integration of the framework in an existent social learning environment will allow field tests to evaluate its effectiveness, trying to answer the second question.

This paper is organized as followed: in Section 1 we present the motivations for a research in GBL and for social gamification of education; Section 2 discusses some of the work around GBL and how it has been applied in schools; In Section 3 we present the guidelines and main features for a framework for social gamification; Section 4 introduces a social network for K-6, intended to be used for our proposal field tests and presents the main steps

of our research methodology; The last section draws some conclusions about the project.

## 2. Social-based and Game-Based Learning

The popularity of videogames among young people has been always under the eyes of educators and they have been used in schools for a long time. Different approaches have been followed from using commercial videogames for educational purposes to developing specific educational games or allowing the students to produce their own games. GBL has an estimated time to adoption, by mainstream education, of 2–3 years (Johnson et al., 2011).

### 2.1. Traditional Game-Based Learning

Early in this century, Prensky (2001) advocated the use of electronic games in teaching, suggesting that its use would be natural for future generations. Gee (2003) also highlighted the potential of video games in learning processes. References to some of the most relevant work and reviews of literature can be found in De Freitas (2006), Habgood (2007), Wastiau, Kearney, and Van den Berghe (2009), and Klopfer, Osterweil, and Salen (2009). So far, approaches to Game-Based Learning have been essentially three (Van Eck, 2006):

- Using commercial off-the-shelf videogames (COTS), taking advantage of the existence of contents in these games that can be used for educational purposes.
- Using Serious Games (De Freitas, 2006; Felicia, 2009; Ulicsak & Wright, 2010; Zyda, 2005), a type of video games developed with non-recreational purposes where learning is the primary goal.
- Students building their own games allowing the development of problem-solving abilities, programming skills and game design skills.

These three common approaches see GBL as a way to use games in teaching, whether those games are produced specifically for this purpose or not, or are created by the students themselves. These approaches pose several challenges. Producing educational video games, with the quality of commercial video games requires large budgets (Johnson et al., 2011). This is a major drawback because the scarcity of quality educational games is a strong barrier to a wider adoption in schools (Van Eck, 2006).

COTS video games have several limitations in their application in education since the contents are limited and may not be complete and accurate. Learning occurs only as a side effect. Not all COTS video games have the same potential with many of them with arguable educational value. However, in general, all COTS video games allow developing digital literacy skills, problem-solving abilities and increased manual dexterity, visual acuity and hand-eye coordination.

Games developed by students lead to the need for teachers with expertise in game design and game development, which is difficult for most subjects.

However, there are several examples of successful use of video games in schools (Wastiau et al., 2009). Quest to Learn<sup>1</sup>, a public school in the United States, is using "game-like learning" as a way to empower and engage students. The viability of using commercial games can be seen in projects like *World of Warcraft in School*<sup>2</sup>, where the popular MMOG *World of Warcraft* is used to engage at-risk students.

<sup>1</sup> <http://www.q2l.org>.

<sup>2</sup> <http://wowinschool.pbworks.com>.

There are several examples about the use of serious games. *Food Force*<sup>3</sup> is a video game, from United Nations' World Food Program, to teach children to deal with humanitarian crisis and disaster response. Another example of a *serious game* is the *Global Conflicts*<sup>4</sup> series, aiming to help students to learn about different conflicts in the world, covering themes like democracy, human rights, globalization, terrorism, climate and poverty.

In respect to students building their own games, one of the most popular platforms is *Scratch*<sup>5</sup>, from Massachusetts Institute of Technology's Media Lab. *Scratch* is a project aiming to give children the tools to build their own games. Another example is Microsoft's *Kodu*<sup>6</sup>, a visual programming language to build games for the Xbox platform and designed to be used by children. Both of these programming platforms also allow users to be part of on-line communities supported by social platforms, respectively, *ScratchR* and *Planet Kodu*.

Other examples of successful use of COTS video games and serious games in schools, in different countries, can be found in Wastiau et al. (2009) and Felicia (2009) and also in Johnson et al. (2011).

## 2.2. Gamification of education

Apart from GBL, another way to use game thinking and game elements in education is to apply the new concept of gamification. Intuitively, gamification has a great potential to motivate students and make school more attractive (Lee & Hammer, 2011). The gamification of education approach has the advantage of introducing what really matters from the world of video games – increasing the level of engagement of students – without using any specific game. The aim is to extract the game elements that make good games enjoyable and fun to play, adapt them and use those elements in the teaching processes. Thus, students learn, not by playing specific games but they learn as if they were playing a game. It is assumed that the idea of playing as the opposite of working or studying does not make sense in this particular approach as in GBL in general. Learning must not be a boring activity while gaming is fun. Learning can be fun if students learn as if they were playing a game.

The term gamification, began to be mentioned in the media in October 2010 (Radoff, 2012; Smith, 2012) and can be defined as the use of game mechanics in several everyday activities. It intends to use mechanics and dynamics from video games to cause a similar involvement in non-game environments (Wu, 2012). Assuming that people like to play but are confronted in their everyday life with non-motivational activities, gamification is a process to induce motivation in those activities. Education is a particular area with high potential for the application of gamification, representing an evolution from the application of Serious Games (Gibson, 2012). Lee and Hammer (2011) state some of the reasons to use gamification in education.

An example of this approach is the Khan Academy<sup>7</sup>, a non-profit project providing free materials and resources with the goal of a better education for all. The project's platform includes several game mechanics like achievement badges and points. It also provides up-to-date statistics of students' progress.

Thus, gamification of education is the use of game elements in a learning environment, usually with the support of ICT. GBL, on the other hand, consists in using actual games (serious games, COTS games or games made by students) in a learning environment.

## 2.3. Social games

The Web 2.0, being user-centric, brought a collaborative and participative role for its users. Internet users are no longer simple information consumers but they are also information producers. Social interactions also play an important role in Web 2.0 applications. As social networks become popular applications they gave rise to social games. This kind of games is played by social networks' users as a way to interact with friends (Klopfer et al., 2009) and is part of the digital natives' culture. Social games have unique features that distinguish them from other video games. Those features are closely tied with social networks' features as pointed by Järvinen (2009), who studied the design of a set of Facebook games.

Due to the influence of Web 2.0 in the way people learn and access information, schools can take advantage of this trend by adopting social learning environments. These environments should allow collaboration among peers and be open to participation of students, teachers, parents and experts on the subjects being thought. A way to engage learners in a collaborative production of knowledge is to promote social rewards. Learning can also be more attractive if learning experiences are a combination of challenge and fun (Vassileva, 2008). Social games can make a contribution with its game mechanics and other design elements being used to gamify social learning environments. The use of social games in school activities, as environments that simulate real-world problems, is beginning to be considered by educators (Ferenstein, 2012).

## 2.4. Frameworks for Game-Based Learning

Since video games began to be used in learning environments, several frameworks have been proposed for their use and design. *UniGame: Social Skills and Knowledge Training* (Pivec and Dziabenko, 2004) is a framework to help a teacher applying GBL in his/her classes. It applies to higher education and lifelong learning. One of this framework's objectives is the possibility of using different educational games within different subjects, focusing on social games, virtual communities and collaborative learning. Games can be used in on-line or face-to-face classes. Another framework for GBL was proposed by De Freitas and Oliver (2006), FDF, a four-dimensional framework for selecting and using games that may also support games' design and development process.

Tan, Ling, and Ting (2007) presented and discussed the features of four frameworks and models for GBL and proposed some features that an educational game must contain. More recently, Linhan, Kirman, Lawson, and Chan (2011) proposed *Applied Behavioral Analysis*, an empirically validated method of teaching, as a framework fulfilling the requirements for designing successful educational games. These GBL frameworks inspire and guide the design of our social gamification framework.

## 3. Framework for social gamification: guidelines and objectives

All of the framework proposals mentioned on the previous section are focused on the use and design of educational games. New and appropriate frameworks and models are needed for the design of gamified learning contents. In a social gamification of education approach, games, by themselves, are not used. Instead, just game elements are considered.

The research in progress aims to assist educators and schools with a set of powerful and engaging educational tools to improve students' motivation and learning outcomes. Our research intends to develop a framework for the use of these tools to be integrated and tested in an existent social learning environment. We see

<sup>3</sup> <http://www.wfp.org/how-to-help/individuals/food-force>.

<sup>4</sup> <http://www.globalconflicts.eu/>.

<sup>5</sup> <http://scratch.mit.edu/>.

<sup>6</sup> <http://research.microsoft.com/en-us/projects/kodu/>.

<sup>7</sup> <http://www.khanacademy.org>.

**Table 1**  
Game mechanics and game dynamics (adapted from Bunchball (2010)).

Game elements	
Game mechanics	Game dynamics
Points	Reward
Levels	Status
Trophies, badges, achievements	Achievement
Virtual goods	Self expression
Leaderboards	Competition
Virtual gifts	Altruism

social gamification as the use of game mechanics and game-thinking from social games to be applied in non-game applications, specifically in social learning environments.

Game mechanics are the mechanisms used to “gamify” an activity (Bunchball, 2010). Most common game mechanics are shown in Table 1. As game mechanics are the rules and rewards of the game, intended to evoke determined emotions on the player, game dynamics are the desires and motivations leading to those emotions (Table 1).

The framework will include some of the most usual game elements, shown in Table 1, adapted to K-6 education. Furthermore, the framework should enable teachers to organize their contents in the platform considering the following guidelines (see Klopfer et al., 2009; Lee & Hammer, 2011; Linehan et al., 2011):

- Allow repeated experimentation – learning activities, like games, should allow repeated experimentation in order to reach a goal.
- Include rapid feedback cycles – immediate feedback helps students improve their strategy and get a better chance of success in the next try.
- Adapt tasks to skill levels – as good games help players to realistically believe in their chances of success, different levels of goals adapted to students’ skills improves their motivation.
- Increase tasks’ difficulty as students’ skills improve – adapting tasks to the skill level of each student improves hers/his expectations on completing the task successfully.
- Break complex tasks into shorter and simple sub-tasks – allowing students to complete small sub-tasks within a larger task helps them to deal with complexity in a divide and conquer approach.
- Allow different routes to success – each student should be able to choose a different sequence of sub-tasks, following hers/his own route to complete the task.
- Allow the recognition and reward by teachers, parents and other students – being rewarded and appraised promotes students’ social status.

With these features or game elements, provided by social gamification tools and aimed to motivate and engage students in their learning processes (Lee & Hammer, 2011), it is intend to reach the following objectives for students, teachers and parents:

- Help students to deal with failure as part of the learning process – in a gamified learning process, failure can be part of learning avoiding students to experience anxiety when facing the chance to fail. Positive failure feedback lead students to keep trying, raising their level of engagement with the task.
- Allow students to experience flow<sup>8</sup> when learning a subject or performing a school activity. In a state of flow, an activity is per-

<sup>8</sup> Flow is defined by Csíkszentmihályi (cit. in McGonigal (2011)) as “the satisfying exhilarating feeling of creative accomplishment and heightened functioning” and is a state that can be experienced with videogames.

formed for enjoyment and pleasure rather than be driven by any extrinsic motivator. Applying game elements and game thinking in schools’ activities will help to provide flow to students.

- Allow students to try new identities and roles – in games, players can assume different identities and perform different roles. In a gamified social learning environment students can safely experience different sides of themselves.
- Develop a school-based identity – a strong school-based identity improves students’ engagement with learning in the long run (Lee & Hammer, 2011). Rewards end incentives given by peers, teachers and parents reinforce the development of such identity.
- Motivate students to improve their skills with social rewards and other incentives – recognition of academic achievements by teachers and also by peers helps students to be closely connected to school and to develop a school-based identity. Social recognition and rewards also motivate students to improve their skills.
- Motivate teachers and parents to reward students’ progress – teachers and parents must be motivated to reward students. With the proper tools and access to data about students’ progress they can do it more often and just after students achievements. Teachers and parents themselves can get recognition and rewards for their participation.

### 3.1. Activity model for social gamification

With the framework, a teacher will be able to deliver specific contents with a gamified leaning process fitted to a learning context and students’ profiles (Fig. 1). The social learning environment will support those contents and allow the teacher to choose the appropriate social gamification tools, based on game-like elements from social games, to promote some desired behaviors. Those behaviors are intended to improve the learning outcomes from the teaching process.

The gamification framework will help and guide the teacher to:

- Create challenges tailored to the student’s level of knowledge, increasing the difficulty of these challenges as the student acquires new skills;
- Set up multiple ways to successfully achieve an objective, allowing students to overcome intermediate goals;
- Set goals with simple objectives, providing feed-back or an immediate reward that allows progress to a new task, usually with a higher degree of difficulty;
- Choose the proper game mechanics to be applied in specific activities, projects or learning processes;
- Consider the failure as part of the learning process: a task can be completed successfully after several failed attempts without penalizing the student;
- Enable students to assume different identities and different roles allowing them to explore other aspects of their personality in a controlled environment;
- Enable recognition of the student’s progress by peers, teachers and parents promoting student’s social status;
- Use competition to promote valuable behaviors.

In our research we will start to identify the most common game elements that are present in social games. A set of those elements will be chosen for implementation in the social learning environment considering the behaviors that they promote. With this implementation the platform will include a set of tools (gamification tools) that will be used with two purposes: one is to apply those tools to foster the users experience, to improve their loyalty and to motivate them to a more active use of the platform. The other, and the most important, is to enable teachers

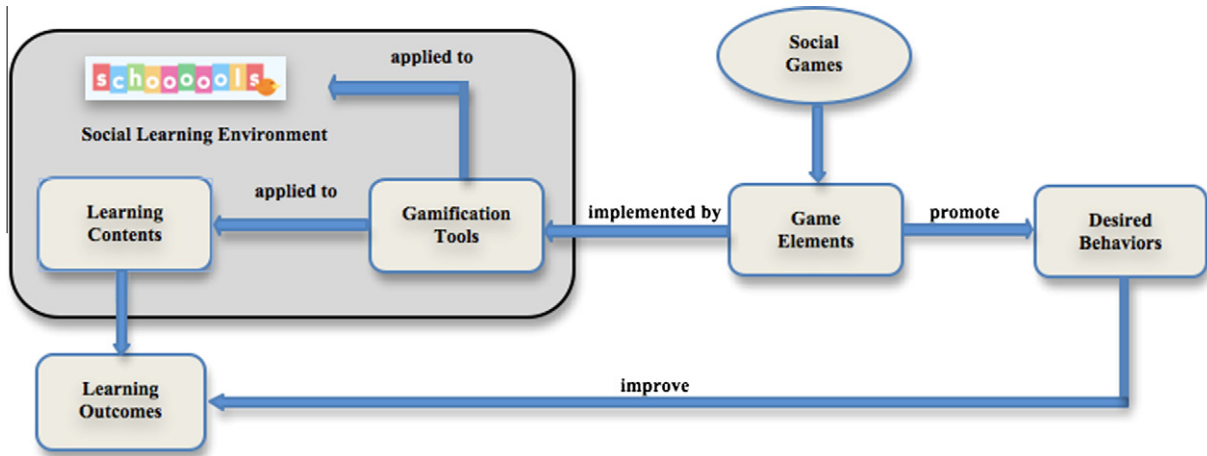


Fig. 1. Social gamification framework: context of use.

to set up gamified and personalized learning activities, using different learning contents, stored in the platform itself, in a Learning Management System (LMS) or in the Internet cloud. The overall objective is to enhance students' engagement and motivation, in the use of the platform and in performing the learning activities proposed by their teachers, in order to improve learning outcomes.

#### 4. Deploying the framework over a K-6 learning platform

The social gamification framework to be provided with the ongoing research work will be tested with an existing social learning platform: schoooooools.com (Fig. 2). The fundamental goal of this environment is to empower children, preteens, parents, and educators to benefit from the enormous educational potential of Web 2.0

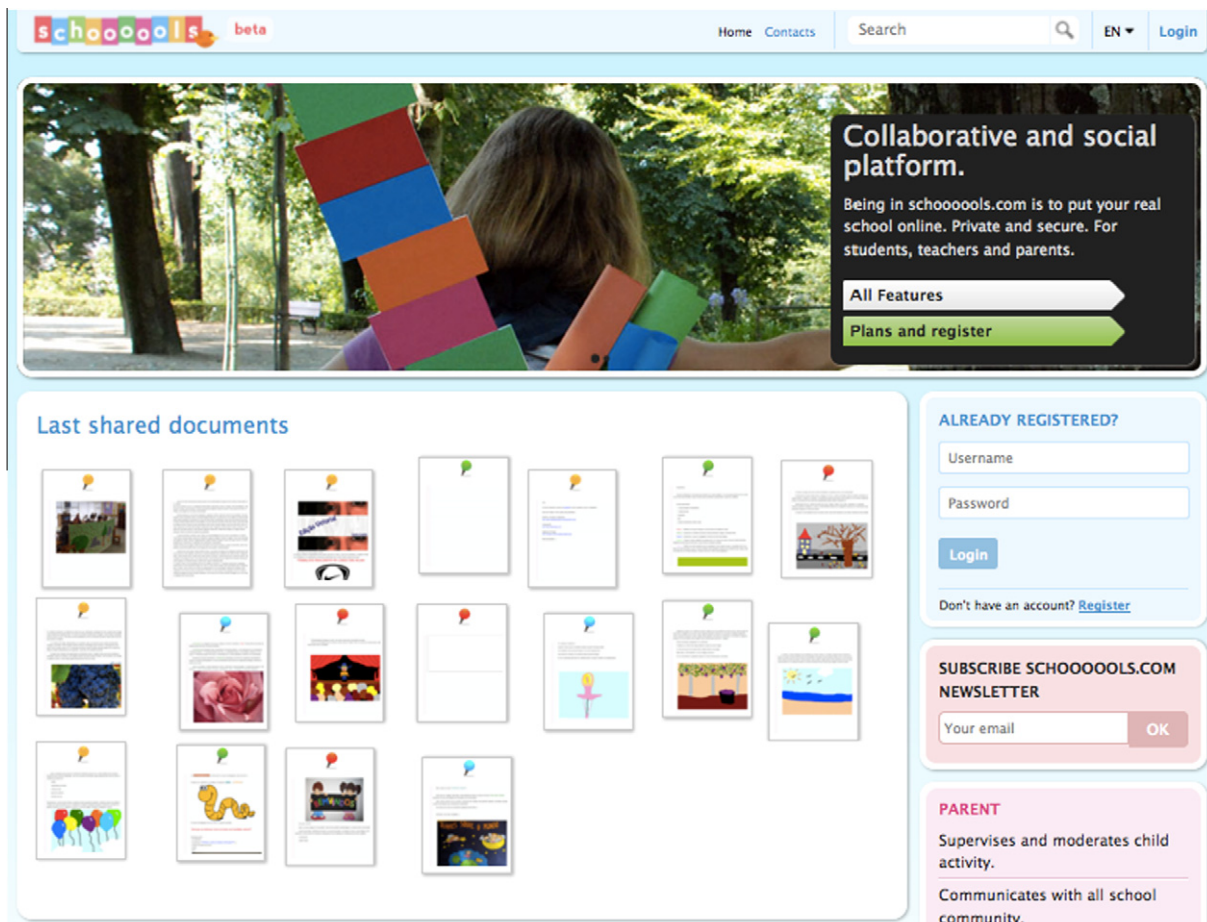


Fig. 2. Schoooooools.com: A K-6 learning platform.



Fig. 3. Schooooools.com: A social learning environment.

and social networks. The platform was especially designed for 6–12 years old children.

The platform schooooools.com gives response to the strong need for social learning environments designed specifically for younger audiences (Simões and Aguiar, 2011). These environments must be simple, easy to use and, above all, safe. On the one hand, existing LMSs, like Moodle, were not initially designed to be used by children. On the other hand, social networks usually have age limitations for their users (e.g. Facebook do not accept users younger than 13 years old). Consequently, the adoption of these platforms in elementary schools' communities is more difficult, or even impossible, than what would be expected by digital native students and teachers with computer skills. At this respect, schooooools.com offers a combined support of families, educators and teachers, which is essential to encourage, guide and ensure the accuracy and quality required in the learning process. From this starting point, the gamification of the schooooools.com will allow us to promote users' engagement and fidelity and to foster students' motivation.

#### 4.1. Schooooools.com

The schooooools.com project started with 54 schools and 18,000 users from the city of Porto, in Portugal, and was made nationally available as a service (escolinhas.pt) in September 2009. By January 2011, the project had about 240 elementary schools registered (Simões and Aguiar, 2011).

The platform provides official web spaces for schools' communities (K–6) to interact and cooperate. It is possible to read, write, paint, draw, play, co-create new digital media (newspapers, radio, TV), communicate, collaborate, share and socialize with their peers, friends, parents and educators. These features<sup>9</sup> are integrated in a single social environment, designed to be intuitive, simple to learn, engaging and funny (Fig. 3).

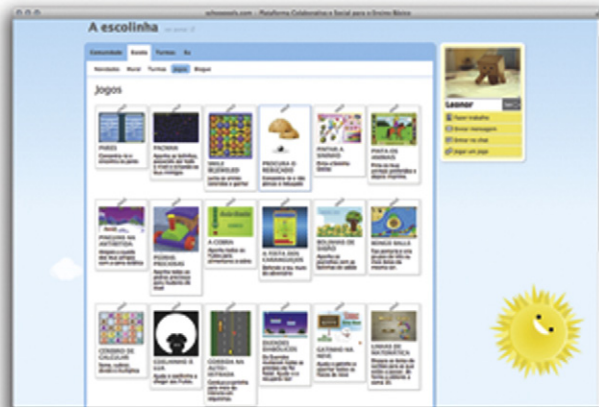
Schooooools.com follows a wiki-way philosophy and was especially designed and integrated for safety, privacy, simplicity and usability compatible for 6–12 years old children, their educators and schools. Configurability and adaptability to real world contexts (schools, clubs, groups, communities) are additional features. The platform is intended to provide children an effective, adapted, and easy introduction to ICT naturally integrated with schools' programs. It also aims to bridge the gap between everyone involved in children education. The platform provides tools for parents interact with their children's teachers while observing their children's work. It is also possible to publish contents to traditional LMS, like Moodle, Dokeos or Sakai, without leaving the platform.

Schooooools.com includes a private social network with features similar to other social networks, like Facebook or Myspace. The private social network is a safe environment without the age restrictions of other similar social applications. In the platform's social network, users (students, teachers and parents) can build a net-

<sup>9</sup> <http://info.escolinhas.pt/wp-content/uploads/2011/06/schooooools-with-sound-v2.mov>, a video presenting some of schooooools.com features.

## Educational games

School is to learn.. by playing!



### Play time

In schooooools.com, we know that we can learn by playing. Therefore, the schools can enjoy our curated selection of games. Educational or recreational, cars or dolls, puzzles or cards, there are games for anyone. Are you looking for a specific game? Contact us and we may select it.

### Control the games in your school

We know that the games in schooooools.com may not please every school. For that reason, the School Manager can disable any game that he doesn't want available for his students.

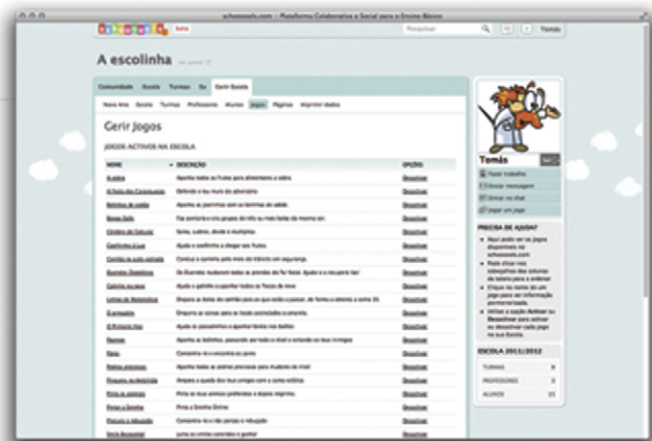


Fig. 4. Schooooools.com: Learning with games.

work of friends, communicate with them (by messages or chat), watch and comment friend's profile and watch and comment shared images, photos and projects built with the platform's collaborative editor. Users can also share with friends their recent activity, answering the question "what are you doing?" like in Twitter. Schooooools.com's philosophy is especially suitable for social gamification since, at some extent, GBL is already part of the platform through the inclusion of educational and recreational games (Fig. 4). However these games are independent of the learning contents in the platform. With gamification it will be possible to integrate game elements with those learning contents and let learning activities become more attractive and engaging.

#### 4.2. Schooooools.com extended with social gamification features

Schooooools.com provides official school web spaces to support collaboration, communication and sharing of schools' contents and activities between students, parents and teachers. These three user profiles have different roles in the platform, whose relevant activities are summarized in Table 2. Those roles can be enhanced by the inclusion of gamification and social gamification features.

The platform, an engaging space to promote collaboration and socialization will be extended with game mechanics. The social gamification framework will then help teachers to gamify their teaching processes by guiding them to choose the appropriate game mechanics respecting learning objectives, student's profile,

nature of contents, student's desired behaviors, assessment, etc. The platform will provide the necessary tools to build the gamified learning process by, for example allowing, the teacher to personalize and adapt badges, trophies or virtual goods or the kind of rewards that students can get. We propose the inclusion of gamification elements extracted from social games (see Järvinen, 2009); the more relevant ones are summarized in Table 3.

#### 4.3. Descriptive scenario

As an example of a gamified learning activity, the following scenario could be considered: if a teacher set up some activity in which students must watch and comment a series of videos (from YouTube or stored in a LMS), she/he can establish a minimum number of videos that each student must watch and assess the comments made by students. Those comments can be shared using the platform's personal or class blogs allowing the teacher and the other students to read and reply to those comments. The teacher can define badges or trophies for students that watch the minimum number of videos or for the first student watching and commenting the whole series of videos. Those badges can be shown in each student's profile in the private social network, allowing the student to share those achievements with peers, friends, family or other teachers that in their turn could comment the achievement, e.g. using a "like" button. Teachers and parents can also reward the student using virtual goods or some tangible reward (e.g.

**Table 2**  
Schoooooools.com: Existing features by user profile.

Students	Teachers	Parents/relatives
Free creation of texts, drawings, stories, documents, etc.	Define assignments and projects	Supervision and monitoring of student's activity
Maintain and develop a digital portfolio and a personal profile	Review, evaluate and show student's work	Browse and archiving of student's digital portfolio
Learn by playing with selected educative games and activities	Share knowledge and experience with other teachers	Patrolling of sensible student's actions
Safely communicate with colleagues, parents, educators	Communicate with colleagues, parents, students	Communicate with students and teachers and core family

**Table 3**  
Schoooooools.com: New social gamification features by user profile.

Students	Teachers	Parents/relatives
Receive immediate feedback and rewards when performing learning activities	Create, manage and assess gamified learning projects using the existing tools and the new gamification tools	Recognize and reward their children's work
Reward peers and appraise their academic achievements (e.g. using a "like" button)	Recognize and reward students' work (with intangible rewards like badges, points, trophies or with some tangible goods)	Get recognition and rewards for involvement and participation in the platform
Publish academic achievements in the private social network's personal profile	Access statistics about students' progress and achievements	Notification of other parents or relatives' achievements; comment those achievements
Share and gift rewards to other students (and publish this action in the private social network)	Notification of students' achievements; comment those achievements	Invite other parents/relatives to participate
Build teams with other students to accomplish a task		
Notification of other students' achievements; comment those achievements		
Invite other students to perform an activity		

tickets to a show). The student can obtain points after watching a video and each individual level of completeness of the activity can be displayed using a progress bar. In result of the obtained points, rankings could show the relative performance of each student. For assessment, the teacher can also propose quizzes for students to answer after watching a video, with different difficulty levels. The platform can store data and produce statistics about students' performance to help the teacher with the assessment of the activity.

## 5. Conclusions and future work

Our research starts from a set of known facts: the popularity of video games and the existence of a generation of digital natives who are also gamers. At the same time, the proliferation of social games has brought new types of players especially those who are motivated by social interaction, participation and knowledge sharing. These facts have to be taken into account when education comes to play and the potential of video games as valid teaching tools has been widely discussed in recent years. Despite the enthusiasm around the GBL, there is still little empirical evidence about its real impact (De Freitas & Oliver, 2006; Linehan et al., 2011). In fact, while there are several authors who reported the potential of games as valuable learning tools there is a need for further research on its real effects on learning processes and if those effects are better than those obtained with the traditional ones. One step beyond GBL, gamification emerged as a new trend in the last couple of years. In this area of study our research explores how to incorporate the distinctive elements from social games with the aim of applying them to social learning environments. Finding how to apply social gamification in education, as an alternative approach to GBL, and validating its application are the main goals of our work.

To accomplish our goals we intend to use schoooooools.com, an existent K–6 social learning environment whose features and tools (private social network, blogs, wikis, etc.) can be naturally inte-

grated with new gamification trends. Since schoooooools.com is collaborative space virtually available everywhere, from a personal computer, a laptop or a mobile device like a smartphone or a tablet, any gamified learning activity proposed by a teacher is also ubiquitous, meaning that students can perform the activity in school or outside school. Taking schoooooools.com to test and validate our work, we propose a framework for social gamification of education. This framework is step-by-step guide in designing socially gamified learning contents. The social learning environment, around schoooooools.com, will provide a set of gamification tools, organized as a dashboard that will help teachers to set, personalize and deploy those gamified learning contents.

Schoooooools.com was initially evaluated, in 2010, with overall positive results. Usability and user experience were tested with classes (children from 8 to 10 years old) from three different basic schools using a heuristic evaluation (Bunchball, 2010). Experts from human–computer interaction field also participated in this evaluation. As a result, some features that were evaluated negatively were corrected and several improvements were introduced in the interface. In late 2011, schoooooools.com started a pilot initiative<sup>10</sup> in the H. Lee Means Elementary, a school in Texas, for training in the use of the platform. In the same year, the platform was part of an entrepreneurship project from Chile's government<sup>11</sup>. Under this project, the platform was evaluated to analyze its adaptability in Chile's basic schools. With this two projects it is also possible to test the platform under different realities in different countries.

The validation of the social gamification framework for schoooooools.com will have an action research approach, with the participation of students, parents and teachers of different subjects. Participating schools will be chosen among those that are already registered on the platform schoooooools.com. It is intended that the experiences to be conducted could answer to the research questions mentioned in Section 1. We also intend that the data ob-

<sup>10</sup> This pilot was part of a program from the IC<sup>2</sup> Institute, a research unit from the University of Texas, Austin.

<sup>11</sup> <http://www.startupchile.org/supprojects/teclacolorida>.



tained from these experiences could contribute with empirical evidence about the use of social gamification.

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