# Online Games for the Next Generation of Workers

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***Abstract*—The "Next Generation", "Net Generation", "digital natives", " millennials" or the "Google generation", are some of the names used to describe the new generation entering to the workforce, growing up in a networked world and having a different set of needs and expectations as to learning and training. Thus, there is a need to find new e-learning environments that would ensure the learners' greater motivation and engagement to e-learning courses, in order to avoid high rates of drop-out. The current research in e-learning is focusing its attention in using innovative environments, such as MMOGs (Massive Multiplayer Online Games) and virtual worlds as training tools. This paper dignifies the need for creating collaborative educational online games, by presenting the findings of a research which revealed that the strong sense of community that the players build in the game, in a popular commercial called World of Warcraft (WoW), was linked with high intrinsic motivation and performance scores. Thus, the ability to collaborate and form communities in a game could trigger cognitive, affective and social aspects of the player's behavior. This paper also presents an expanded framework for creating intrinsic motivation in MMOGs, proposed by Malone and Lepper, adding the element of sense of community as a support of intrinsic motivation.**

***Index Terms*—E-learning, Games, Motivation, Next Generation.**

## I. INTRODUCTION

It is thought that 21st century people require a different set of skills in order to cope with the complexity and the faster pace of life, such as problem solving and identification skills, developing critical facilities, understanding the value of experimentation, and the ability to collaborate [1]. Next generation people need to develop "digital age literacy, inventive thinking, effective communication, and high productivity" [2]. These are known as "the skills for 21st century", or next generation skills and they are all fundamental to the success of knowledge workers [3].

According to that, Dede [4] has identified three specific abilities that are of growing importance for the next generation of workers:

- Collaborate with diverse teams of people—face-to-face or at a distance—to accomplish a task.
- Create, share, and master knowledge by assessing and filtering quasi-accurate Information.
- Thrive on chaos, that is, be able to make rapid decisions based on incomplete information in order to resolve novel dilemmas.

Learning in nowadays is not longer considered as an individual process, but as a social one, that is, now more than ever, influenced and accomplished through a network of peers, colleagues, friends, and family [5, 6]. Thus, as our need for collaboration grows, the tools that connect us in social networks and support the creation of online communities evolve as well [7, 8].

Online communications facilitate groups of people coming together over the network to discuss any issue imaginable, to ask questions and share provocative insights to which others can respond [9]. Therefore, knowledge is not longer limited to one individual's thinking, but rather shared and accessed in a variety of ways.

According to these thoughts, we assume that education and training should aim at developing these skills, educating 21st century skilled workers. However, employers have their doubts about formal education, stating that "young people of all abilities are finding it harder to cope in their early years at work because they have been stifled in the classroom and text book learning rather than seeing and experiencing how they learn is applied in the world outside" [10].

Moreover, many young people today are not acquiring these 21st century skills through structured learning environments, but rather through various "cognitively-demanding leisure" activities they choose to engage with, including to a larger and larger extent, online games and virtual worlds [11]. These multitasking activities of information and communication technologies are raising the bar on the competencies needed to succeed in the 21st century, and they are compelling us to revisit many of our assumptions and beliefs [2].

## II. THEORATICAL BACKGROUND

### A. Online Games

Online games, such as MMOGs (Massive Multiplayer Online Games) and MMORPGs (Massive Multiplayer Online Role-Playing Games), are not games in the traditional rules-based sense, but rather "persistent social and material worlds, loosely structured by open-ended (fantasy) narratives, where players are largely free to do as they please" [12].

A significant body of research supports that online games can be useful educational tools, because of their ability to teach people in a fun, engaging, motivating, interesting and encouraging way, enabling the teaching of complex new information, otherwise too difficult to be taught in a classroom, since knowledge can be adjusted for different types of learning, and leading to the devel-

opment of strategic skills through experimentation, trial and error [13, 14, 15,16, 17, 18, 19, 20, 21, 22].

Interest into the transferability of leadership skills built in virtual worlds to real world situations has attracted both academic and practitioner interest. IBM, has begun identifying employees who lead in virtual worlds and exploring leadership characteristics and their applicability to management practice [23].

Companies, such as IBM, are currently researching the links between MMOG team management and, the concept of leadership [24], while, research using MMOGs as tools in the areas of inter-human trust and conflict is currently being initiated [25].

The educational value of digital games has been discussed by many learning theories over the years. Though constructionism and cognitivism focus more on the player, the sociocultural approach offers a more global perspective, encompassing the player, the game, and the context of the game [26, 27].

As situated learning theory states [28], learning, thinking and knowing emerge from a world that is socially constructed. Commercial games (such as MMOGs) and virtual worlds (such as Second Life) are considered to be complex learning systems with a full range of social and material practices [12]. However, while most educational games are based on behaviouristic models providing drill-and-practice activities, commercial games, such as MMOGs, are based on their communities of players. Thus, we underline the need of designing educational games as communities of learners, by using elements of online commercial games.

## III. DESIGNING MOTIVATING ONLINE GAMES: THE NEED FOR REASEARCH

In order to understand MMOGs, we need to find out what does motivate people to play them. However, despite the significant amount of educational research and the growing interest of the scientific community in MMOGs, there is a lack of empirical research considering cognitive and social aspects of these games [12, 29, 30, 31].

Concerning the question "what motivates players to play MMOGs?", Malone and Lepper [32] described intrinsic motivation as the feeling that one should have for doing something without external inducement or rewards, and subdivide the intrinsic motivation in individual and interpersonal factors. According to Malone and Lepper's theory, in games, the individual factors, of challenge, fantasy, control and curiosity, seem to motivate a player when he/she is working alone, while the interpersonal factors of cooperation, competition, recognition motivate a player when he/she interacts with other players [32].

These factors have been considered as important for developing motivating games for the past 20 years. Yet, are these factors enough to explain the motivation of millions of players to form groups and play a game like a MMOG in nowadays?

It is claimed that in MMOGs it is the social bonds created by players that motivate them and keep them returning to the game and form "temporary groups" [33]. Could this sense of community created in multiplayer games be the true reason for playing a MMOG for a long period of time (maybe for years)?

The psychological sense of community is "the perception of similarity to others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, and the feeling that one is part of a larger dependable and stable structure" [34]. McMillan and Chavis [35] define sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together." According to McMillan and Chavis, the sense of community consists of feelings of membership, feelings of influence, integration and fulfillment of needs, and shared emotional connection [35].

Overall, could the formation of groups in a game (called guilds or clans), be the reason for developing a strong sense of community; and is this sense of community a motivating factor for playing and performing well in the game?

These questions led to the conduction of a research considering the relationships between physiological factors such as sense of belonging in a group, intrinsic motivating and game performance, in order to better understand the popularity of MMOGs. This research aims at highlighting the important factors that build a strong sense of community in a MMOG, in order to conclude to good game design principles that could be used to design good online educational games.

### A. *Methodology*

The research tried to examine whether the relationship between the sense of community in a group [35] (dependent variable), intrinsic motivation [32] and game performance (independent variables) (Figure 1).

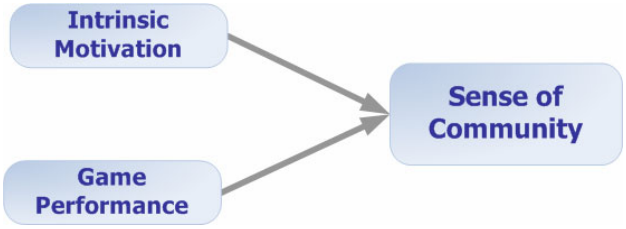


Figure 1. Research Framework

The research focused on a MMOG called Word of Warcaft World of Warcraft (WOW), due to its popularity across the globe. This is the most popular game for the year 2007 and according to Blizzard Entertainment [47], it has extended its subscriber base to 11.5 million subscribers worldwide and continuing to extend it everyday.

The final sample of this research were 64 WoW players between 12-16 years old, who were chosen from a wider sample of 100 MMOG players, based on their focus on this particular game and their participation in WoW's groups (guilds) (response rate =64%).

The research questions were:

- RQ1: Is there a relationship between the sense of community and performance in the game?
- RQ2: Is there a relationship between the sense of community and intrinsic motivation in playing the game?

To address these issues, the theoretical framework of intrinsic motivation in games by Malone and Lepper [32]

was used to create a 7-item closed-response questionnaire to obtain information about the reasons why WoW is pleasant and motivating. Subjects were asked to rate each item (on a 5-point Likert scale).

In order to examine the sense of community in WoW, we used the questionnaire of McMillan and Chavis [35] which has been validated in many social studies and is the most broadly validated and widely utilized questionnaire concerning sense of community in the psychological literature. Subjects were asked to rate each item (on a 5-point Likert scale).

Finally, a questionnaire was used for the collection of self-reported data concerning players' performance, including the frequency of game play (hours per week), their current level (low – medium- high) in the game and the level completion time (amount of time required for a level to be completed).

The validity and reliability of the instrument used in this research (Cronbach's Alpha) was α=0,736. Quantitative analysis techniques (Pearson Correlation Analysis and Regression Analysis) were used to investigate the relationships between the research variables. The Normal P-P, Q-Q graphs and the results of a One-Sample Kolmogorov-Smirnov Test indicated that all the variables followed the standard Normal distribution.

### *B. Research Findings*

Pearson correlation analysis indicated a strong positive relationship between sense of community and intrinsic motivation (r=0.479**) and between sense of community and game performance (0.298*). These findings reveal that the ability to develop a community in a game seems to be motivating for the players and that when the sense of community in a game is strong the player's performance can be enhanced.

In order to validate these relationships, a multiple linear regression analysis was conducted (Table I), showing that the Sense of belonging in a community has a relationship with Intrinsic Motivation and Game Performance, according to the Equation:

Sense of Community= 1.234+0.427*Intrinsic Motivation + 0.188*Game Performance **(1)**

This relationship implies that the development of communities in a game is possible to increase intrinsic motivation to players and enhance their performance in the game (Sig. Intrinsic motivation =0,001 and Sig. Game performance =0,072).

TABLE I.
MULTIPLE LINEAR REGRESSION: REVIEWED COEFFICIENTS

| **Coefficients**[a] | | | | | |
|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | t | Sig. |
| | | B | Std. Error | | |
| 1 | (Constant) | ***1,234*** | ,553 | 2,231 | ,030 |
| | Intrinsic Motivation | ***,427*** | ,120 | 3,550 | ,001 |
| | Game Performance | ***,188*** | ,102 | 1,840 | ,072 |
| a. Dependent Variable: Sense of Community | | | | | |

The above findings indicate that the multiplayer factor in a game is a good design principle that should be taken into account for designing educational games, where, more than anything, we want the learners to be intrinsically motivated and perform well.

## IV. INTRINSIC MOTIVATION IN GAMES: AN EXTENDED FRAMEWORK

Malone and Lepper [32] presented a theoretical framework with the important factors which create intrinsic motivation in games. According to their framework, intrinsic motivation includes four individual factors (challenge, fantasy, control and curiosity) and three interpersonal factors (cooperation, competition, recognition) (Figure 2). These factors have been considered as important for developing motivating and appealing games for more than 20 years.

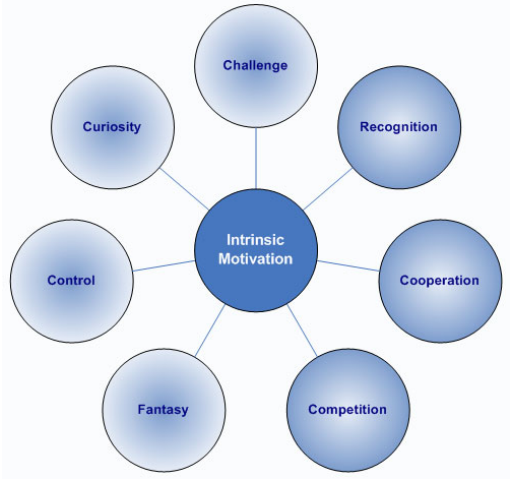


Figure 2. Intrinsic Motivation [32]

However, the findings of the research, as presented in this paper, concluded that there is a strong connection between intrinsic motivation and the sense of belonging in a group, created in MMOGs according to the relationship (1) noted above .

Therefore, the framework that Malone and Lepper suggested can be extended as presented in figure 3.

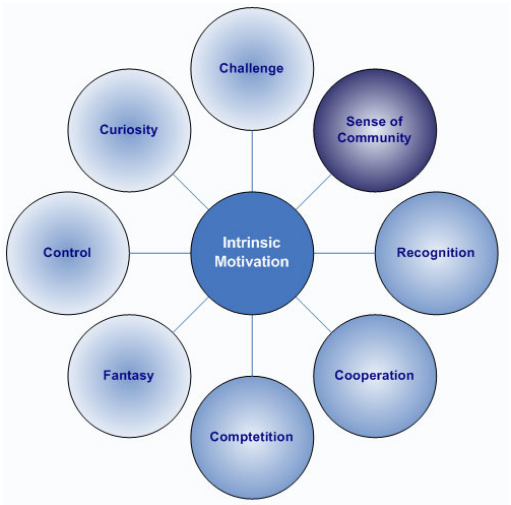


Figure 3. Intrinsic Motivation in MMOGs

This new dimension (sense of community) for creating intrinsic motivation in MMOGs can be used for designing Educational Multiplayer Games that could develop the next generation skills that the MMOGs foster and the new generation of workers should acquire.

The results of the research, as described in this paper, imply that the sense of community in a multiplayer game is possible to increase players' intrinsic motivation. This sense of belonging in a community consists of feelings of membership, feelings of influence, integration and fulfillment of needs, and shared emotional connection.

As Steinkuehler cautions [12], the focus cannot be simply on the MMOG technology or the curricular material that needs to be learned. The design of the system must include the appropriate and emergent social structures or practices that will always accompany the technology.

In order for an educational or training multiplayer game to enhance intrinsic motivation, expert players (guides) could offer help, in forms of advices and hints, to the newcomers (newbies). Collaboration among players could be fostered by providing rewards to experienced players for helping others and working in groups, rather than rewarding individual players.

Moreover, just like in the popular MMOGs, the players should know who is available to cooperate, as well as their level and their location in the game. So as to encourage collaboration among players, the game should provide tools for private communication and player/group statistics.

In addition, an educational multiplayer game should provide the opportunity for developing different, complementary roles with unique abilities and skills. By this way, the game will reflect the real life roles that work together in order to create permanent or temporary groups and function in communities.

There is much in contemporary game design to be explored and annexed to support different types of learning. The design of MMORPGs is a potential flexible model that may be of use to instructional designers and educators looking at how to develop interactive and game-based learning environments which are engaging for all students [36].

It seems that MMOGs could be a good model for developing motivating educational online games for training large communities of players, where information sharing and collaboration contribute in authentic practices and social interaction, in a situated learning environment.

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