Player Characters as Devices for Supporting Learning in Massively Multiplayer Online Games

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ABSTRACT
In this paper, we explore the potential of player characters, in Massively Multiplayer Online Games, to support learning. We situate our study within a context consisted of the cognitive, the social, and the affective dimensions for the support of learning, on which we map relevant attributes of the player characters. For identifying these attributes, we employed a mixed method research approach and analyzed the perceptions of players based on data from interviews and a survey. Player characters seem to be at the intersection of the game mechanics and the real life player personality and may constitute dynamic elements for supporting learning in a virtual environment.

Keywords
MMOGs, learning, cognitive, affective, motivation, social, virtual character, engagement.

1. INTRODUCTION
In this study we focus on the learning aspects of Massively Multiplayer Online Games (MMOGs) and discuss the role of the player characters or avatars within this context. Over the past few years, the potential of MMOGs for learning has been recognized [1, 3, 11, 14, 25, 29, 32, 33]. Players have to develop skills relevant to the game tasks, the navigation in the virtual environment, the strategies and tactics required, the interaction with the interface, and also interpersonal, communication and collaboration skills relevant to their interactions with other players within the community of the game [6, 13, 22, 24].

The player characters seem to play a predominant role in the gaming experience. They constitute the embodiment of the player in the game environment; they mediate the interaction with the interface and, in the case of MMOGs, with the other players. It is through their virtual characters that the players experiment with new identities, they develop a social capital, and they learn not only how to play the game -the relevant information and rules, but also how to act, behave, and "be" in it [11, 28].

We are based on a theoretical framework consisted of three main axes involved in the support of learning and the acquisition of knowledge -the *cognitive*, the *social*, and the *affective* dimensions,

and we attempt to map, through the analysis of qualitative and quantitative data, features and functions of the player characters, in a learning context. Research on the impact of the different elements of MMOGs on the players could help us better understand and unlock the learning potential of MMOGs for the design of effective collaborative environments for learning.

2. THEORETICAL FRAMEWORK: THE LEARNING CONTEXT
For this study, we employ a theoretical framework, further described also in [31], which situates learning within a matrix of three main axes: the *cognitive*, the *social*, and the *affective*. Relevant research in the area of learning indicates that it is not only the *cognitive context* that has an impact on the learning experience and the learning outcomes, but also the *social* and the *affective context*.

The *cognitive context* is relevant to the content of the learning material, the acquisition of information and knowledge by the learner, and the cognitive and meta-cognitive skills involved. The *social context* refers to the quality of interactions, the communication, the collaboration, and the relations among the participants in a learning environment. Meaningful communication, social cohesion, a network of relations, and collaboration among the participants seem to increase the efficiency of learning processes such as problem solving, and support learning through the participation in the practices of a community [4, 5, 12, 20]. The *affective context* involves the emotions, the attitudes, and the motivations of the learners, with respect to the learning environment. Positive emotions and motivation have a positive impact on engagement with the learning content and on the learning outcomes [16, 17, 21]. For the comprehensive study of learning, all these aspects have to be considered, since they seem to be complementary and inter-dependent [26].

In our study we identified and mapped features of the player characters that correspond to the support of these three dimensions.

3. RESEARCH METHODOLOGY
We employed a mixed method research methodology combining a qualitative and a quantitative approach. The combination of qualitative and quantitative data can complement each other and provide us with a more multidimensional view of the field [8]. Through the qualitative approach (data collected from interviews and comments to open-ended survey questions) we aimed at acquiring a broader insight of the issues involved and identifying

phenomena and patterns emerging. The quantitative approach (data from an online survey) would allow us to explore specific issues in depth and examine their generalizability. The participants in our study were MMOG players from various MMOGs such as *EVE Online*, *World of Warcraft*, *Lineage*, and *Tribal Wars*.

We conducted 20 individual semi-structured interviews and 2 focus groups of expert players (N=27), while in the survey, there were 27 comments in the open question for Q12 and 8 comments in Q13 from different participants.

The survey was online and it was posted on different gaming and academic websites and fora. For this study, we analyzed questions Q12 *"Why did you select that particular character (your main character)? (select all that apply to you)"* and Q13 *"Do you have any other alternative characters (alts) in the game, and if yes, why did you create them? (select all that apply to you)"*. These were multiple choice-multiple response questions with an additional open field for comments. The questions and possible answers were designed based on the main themes that emerged from the analysis of the interview data, in relation to the selection of the player characters. The sample for Q12 was N=240 and for Q13 N=208.

For Q12 possible answers were: a) There are not different characters in my game, b) I like the appearance of the character, c) I like the skills of the character, d) I like the background story of my character, within the mythology of the game, e) It matches my character, my personality, or my ideology, f) Someone else proposed this avatar to me/ Someone else gave me this avatar, g) It was easy to learn how to manipulate the particular character, h) Other (please specify) [open comments field]. For Q13 the possible answers were: a) To support my main character, b) to help my team, c) To see other aspects of the game and gameplay, d) Because I want to know the features of other characters too, e) I do not have any other alts besides my main, f) My game does not give the option to select different characters.

For the qualitative analysis of the data we employed both an in-vivo approach for identifying emerging themes and issues, and we were also guided by the constructs of our theoretical model. For ensuring the reliability of the codes used, a second independent coder also participated in the coding process. For the coding and analysis of the qualitative data we used the qualitative analysis software *QSR Nvivo 8*.

For the quantitative data, in this study we present a descriptive analysis of the responses of the players in questions Q12 and Q13. For our analysis we only considered the responses of the players who had player characters in their games, and we, therefore, omitted answer "a" in Q12 and answers "e" and "f" in Q13.

From the analysis of the qualitative data, and based on the axes of our theoretical framework, we identified the dimensions and functions of the player characters as devices for supporting learning, described in the following section. Through the descriptive analysis of the survey data, we aimed to examine in depth the emphasis given to these dimensions in a larger sample of players.

4. THE DIMENSIONS OF THE PLAYER CHARACTERS

4.1 Cognitive Dimension

4.1.1 Content Exploration

In MMOGs there is usually a variety of different virtual characters with different features, skills, potential, different playing style, and a different role in the story of the game and in the players' teams. Each character provides a different gaming experience. In many cases, the players may create and play with more than one characters (i. e. the 'main' and the 'alts') -although not necessarily simultaneously, and therefore, access different aspects of the game and acquire a more global view of the environment through their virtual characters. This aspect of the player characters as a tool for exploring the content of the game is illustrated in the following indicative interview excerpts and questionnaire comments: *"[in Lineage] I knew that at some point I would have to cope with other characters, so I wanted to have a more global view of their playing style, their skills, and the strategies needed for confronting them. [...] I have also created an Orc character, a warrior, so as to learn the skills they have, to see the playing style [...] I have also created a Mage, so as to see their aspect of the game as well", "[I created a second character] To increase the complexity of the game"*

4.1.2 Progress and Support

The players, taking advantage of the complementarity of the different characters often create more than one characters also with the aim to facilitate and reinforce their progress or the main character's progress in the game. For instance, they develop additional characters such as "mages" or "blacksmiths" for supporting their "warrior" main character with healing spells and provisions. The players also create specific characters with the aim to support their group. Through the skills and the resources of the different characters, the group can more easily acquire experience points and progress. Indicatively: *"I needed a Dwarf [because] I needed to craft stuff, and the clan also needed a crafter [...] so when I joined the clan I decided to create a Dwarf", "I created the Crafter character for the money [income]. [for] the same [reason] I created the Spoiler; again for the money. For the Prophet, I created him because you simply can't level up without a Prophet.", "[the character I created] was essential for my group"*

4.1.3 Immersion into the Narrative

In a well-designed game, the virtual characters constitute an integral part of the story and the narrative of the environment. The mythology and the lore of the game are the backdrop for the progress of the plot. Every character plays a unique role within this story. Narrative, within a learning context, provides opportunities for thinking, assessing, researching, and it also supports a consistent and meaningful framework for the actions and tasks of the learners [10]. Through the connection of the abstract concepts with the problems to be solved, the situated understanding of the context can be supported [2, 27]. Through the player character, the player is immersed in the narrative and the context of the story. Indicatively, an *EVE Online* player was vividly describing, during the interview, the background story of the game: *"[the races] correspond to the four main tendencies of our modern [real-world] society, the global society. There is a*

theocratic race, a capitalist race, a race of ex-slaves, and a democratic race. The opponents of the ex-slaves are the theocrats, and the opponents of the capitalists are the democrats."

4.2 Social Dimension

4.2.1 Promoting Collaborative Interactions

The character types, in most of the cases, are complementary; every character needs the other character types for 'surviving' and progressing in the game. The characters need each-other for acquiring resources, and for completing the quests and missions of the game. Collaboration among the different player characters, and therefore the players, is essential, as also illustrated in the interview excerpts: *"there is not a single 100% positive char, nor a single 100% negative char. They all complement each other either in party in PVE or in PVP. At the point where someone lacks the skills necessary, there comes another one who has these skills and complements him/her. Nothing can be done with a single char or a single class. All the chars have to cooperate", "[the different characters] close the circle of the game; the economic circle of the game. Someone will be a better miner, and so he/she will work with the minerals and supply to the market. The constructor will buy the minerals and, since his/her construction skills are better, he/she will produce more ships with less minerals", "Me and my team, we selected our characters together, after some discussion and having as our main aim the best possible role distribution in our team. So I took up the task of creating a warrior. The choice of the race was up to my personal aesthetic criteria."*

4.3 Affective Dimension

4.3.1 Selecting Playing Style

The different types of game characters, the variety of their game styles, and the different gaming experience each one supports, provide to the players the possibility to select the approach and the playing style they prefer and the one that best corresponds to their motivations, goals, and expectations. As the players reported, indicatively: *"If there was no variety of game characters types, the game would be monotonous. I think that is the main reason [for character types variety]: to play the game again and again; to discover new things", "Based on the descriptions I had read and comments from other players, I decided I like that specific character type, the Kamael, the most, because it is designed to act in the context of massive PVP and create chaos; it uses debuffs for disarming the opponents, leave them stunned, that is in a condition where they can't attack for a few seconds. And that is what drew me to this specific character type", "[My player character] is a long range combat character type. It doesn't have to be close to the monster. Short range combat frustrates me. It frightens me. I'm afraid that the monster may kill me, because when you get killed you lose your XP [experience points]"*

4.3.2 Expression of Player Personality and Ideology

An interesting aspect that emerged from the analysis of the interviews was the identification of aspects of the player character story or personality, with aspects of the personality and ideology of the player. Identification or opposition with the story, the appearance, and the behavior of the virtual character, with the real life attitudes, the personality traits, the behavior and beliefs of the player, were among the main motives for character type selection. In many cases, in our interviews, the players referred to the political or historical dimension of the game, in relation to their selection of virtual character. They also compared features of their own personality, their behavior, and ideology in real life, with the background story or the "personality" of their player character. As reported in our interviews and questionnaire comments: *"[my player character] is my opposite, my alter ego.", "If someone wants to play the bad guy, he/she will select an Orc or a Dark Elf". "[I selected a healer player character because] I like helping other people", "I like Dwarfs because they express a way of life different than mine".* It was interesting that in one of the cases, identification with the ideology was expressed by an *EVE Online* player, even though in *EVE Online* there were no player characters, but rather the players had a third person perspective of their ships: *"[...] and certainly, due to my own personality and ideology, I selected a democratic character".* It seems that in this case, the identification was mainly triggered by the narrative and the background story of the race the player had selected.

4.3.3 Emotional Bonding

There were cases, in our interviews, that the players referred to the emotional bonding they felt they had developed with their player character. The players referred to the time they had invested for evolving, modifying and personalizing their character, the animations and the appearance, how they selected the character's name, processes through which the character had become their own personal creation, and had led to an emotional bonding. The player character appeared to be the representation of the player in the virtual world. Indicative excerpts: *"If you give a name to the character, you feel a bond with it. It's like a pet. You take it home and it never leaves you", "You create it, you love your character, you feel proud for it, you dress him/her, very simple apparel in the beginning, and then more elaborate. You take screenshots and you see how he/she was at level 10, and then at level 20, and 30, and you say 'look how he/she was!' This is more or less how it goes".*

4.3.4 Appearance and Aesthetic Appeal

The external representation, the appearance of the virtual character also seemed to constitute an important element reinforcing the connection of the player with the character. In many cases, the players reported selecting a virtual character that corresponded to their aesthetic appeal: *"I really like the little elf I selected. She is like a fairy, like a little girl. That's why I chose it, in the beginning", "For the race I have selected (undead), I was mainly based to my aesthetic criteria; it was the only race available that I liked", "[I selected] a Monk because I like martial arts, and a female because some gear and some movements don't show that well on male models".*
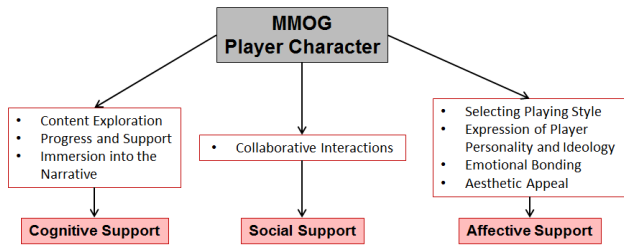
Figure 1.Functionalities of the Player Character for the Support of Learning

4.4 Players' Motivations for the Selection of Characters

Further examination of the players' motivations for selecting their main and secondary (alts) characters through the survey responses seemed to confirm the trends described in the previous sections, particularly in relation to the cognitive and affective aspects of the player character. The results indicated that the skills of the virtual character was the most popular criterion for the selection of the main character (75.4%), while the exploration of other aspects of the environment was the most popular criterion for the selection of the secondary character (70.2%). The appearance of the character as a motivation was selected by 37.9% of the players, while identification with personality and ideology of the player, and the background story of the character attracted 35.4% and 32.9% respectively. Learning the features and potential of other characters was reported by 49% of the players as a motivation for the creation of a secondary character. The percentages in the grand total of the players for each answer are presented in figures 2 and 3.
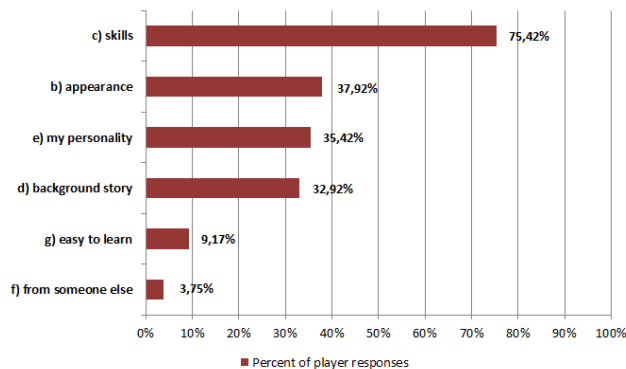

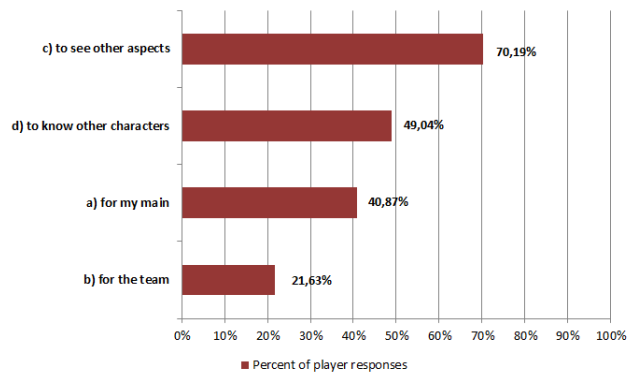**Figure 2. Criteria for the selection of the main player character (Q12)**

Figure 3. Criteria for the selection of the secondary player characters (alts) (Q13)

5. CONCLUSIONS

In this study, we examined the players' perceptions regarding their player characters and identified aspects relevant to the cognitive, the affective, and the social dimensions of the game (summarized in fig.1). The player character constitutes a dynamic and multidimensional device; through their characters, the players explore the content of the environment, they progress in the game, they interact and cooperate with other players, they select the style and pace of their game, and they pursue their aesthetic motivations. The relation between the player and the player character at an emotional and ideological level also constitutes another interesting issue that emerged. The customization and the development of the characters seem to increase the internal motivations of the players, while elements of the character's personality and the background story seem to also strengthen the relationship of the player with the character, and the engagement of the player with the environment. It seems, therefore, that beyond the graphical representation of the virtual character and the player's perspective in the game (e.g. first-person, third-person), the background story of the character, the historical - political - ideological background and the personality of the character may also have an impact on the motivation and the engagement of the player.

Our conclusions seem to be consistent with previous studies on the relation between players and player characters. The representation and the appearance of the virtual character seem to have an impact on the behavior and attitudes of the players in the virtual environment [23, 34]. Beyond the behavior in the game, though, the players become emotionally connected with their characters [9]; the background story, the narrative, the "personality" of the character, the common traits of this personality with the personality of the player, the impact of the player on the character's behavior and progress, and the belief and interest of the player in the character, seem to constitute equally, or even more important factors than the graphic representation, relevant to the engagement, the empathy, and the enjoyment of the players [15, 18, 30]. The importance the players attribute to the social status of their character within the player community as a critical aspect of their player character identity was discussed by Carter et al. in [7] who, based on reports of *EVE Online* players, distinguished the virtual representation, from the name and the reputation of the virtual character. Similarly, Kujanpää et al. in

[19] described the achievement, the social, and the immersion aspects as sources of value of the character, for the players.

We also linked aspects and functionalities of the player characters to the three main dimensions described in our theoretical framework that can support learning. The player characters constitute integrated elements that may contribute to the support of the cognitive, the affective, and the social aspect of the environment. Although individual differences and player/learner models would have to be considered, such as differences in learning styles and strategies [35], cultural differences [36], and playing styles [37], the multidimensionality of the player characters seems to correspond, nevertheless, to the requirements for the design of an effective learning environment.

This study aims to contribute to the dialogue on the learning potential of MMOGs. By proposing a learning framework and applying it to the examination of specific elements of MMOGs and their impact on the players, we hope to contribute to the link between valid theoretical models, educational design, and the design of effective and engaging networked environments for learning. The virtual character seems to constitute a powerful tool for constructing an effective and motivating learning experience within the virtual environment. Certainly, further research could provide more in-depths insights on the best practices and the design implications of the player characters.

6. ACKNOWLEDGMENTS

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