

**Digital Game Education: Designing interventions to
encourage players' informed reflections on their digital
gaming practices**

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ABSTRACT

This thesis describes the development, implementation and evaluation of a model of game education, here understood as the process of educating about digital games. The pivotal characteristic of this model is in placing the claimed influences of gaming (e.g. cognitive gains, increase of aggression) at the centre of the content to be learnt. It is based on five principles, namely, that game education can be Informative, Critical, Empowering, Emancipatory, and Dialogic, hence the ICEED Game Education Model.

The ICEED model was inspired by both the academic literature and the first study of this thesis, in which 15 University students were interviewed regarding the influences of their gaming practices. Later the model was operationalised in a course named Reflective Gaming Course (RGC), which addresses a series of positive and negative influences of gaming according to the ICEED model. Using a Design Based Research methodological framework, the course was implemented, evaluated and improved as an extracurricular course for adolescents in a secondary school and then in a college, in the second and third study of this thesis.

The contributions of the thesis can be divided into four sections. The first is the ICEED Game Education Model, which offers a novel and useful conceptual understanding of what game education can be, hence expanding the possibilities of how game education is conceived. The second section is the Reflective Gaming Course, which is a concrete course plan that can be reproduced or adapted by researchers or practitioners. This course was improved through two implementations, and it was found to be a useful and promising practice. By providing accounts of the course, the process involved, the outcomes achieved, the successes and failures, it is hoped to provide detailed information to inform future projects. The third section is a discussion of the findings with regard to the difficulty of transforming the academic literature on the influences of gaming into useful content for players. This highlights a limitation on the part of research in this area, which often overlooks the potential of its claims to inform players and encourage them to improve their gaming practices. The fourth section concerns knowledge about players' perspectives about the influences of their gaming practices, complementing other similar studies. In the perspective of participants, some of the topics were perceived as more important (e.g. tangential learning, cognitive gains, excessive gaming) others less so (e.g. connections with school, aggression, stereotypes). Their perspectives also illustrate the recurring absence of opportunities in which players can problematize their perspectives on the influences of gaming.

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1. INTRODUCTION

When I was 11 years old I was fascinated to hear about the ancient Assyrians, Babylonians and Sumerians in a history class. I had played with these civilizations some days earlier with the computer game *Age of Empires* (Microsoft Studios, 1997). Later in my life I have had to take decisions about limiting my gaming practices, such as stopping playing *Neverwinter Nights 2* (Atari, 2006) with my friends in order to graduate successfully. More recently, living in Nottingham, I had the chance to travel Europe and visit some monuments which used to intrigue me during my *Sid Meier's Civilization II* (Micropose, 1996) sessions. My experience with the English language throughout my life was occasionally accompanied by the thought “I know this word due to my gaming experiences”.

I was sure I was not the only player to conclude that gaming has the potential to play a positive role in one’s life. However, I also observed friends’ and colleagues’ practices and noticed that different gaming choices can have other consequences to some players. I watched colleagues fail in school while unable to control gaming compulsion; and I perceived that whereas I normally would search for mind stimulating games, some colleagues would spend hundreds of hours playing games which I would have described, at the time, as dumbing down and repetitive. When I began the doctoral journey the idea that *gaming matters beyond the gaming activity* was one of my initial interests, and it became one of the pieces of this doctoral jigsaw. This piece included the academic claims of both the positive influences of gaming (e.g. increased attention, improved ethical reasoning) and the negative ones (e.g. excessive play, reinforcement of gender stereotypes).

Another topic that was derived from my background was the possibility of mixing digital games and education. I wrote about educational games (Albuquerque and Fialho, 2009; Albuquerque et al., 2009) about the use of commercial games as pedagogical tools (Cruz, Albuquerque and Azevedo, 2010), and about game creation workshops in schools (Cruz, Nóvoa and Albuquerque, 2012; Albuquerque and Cruz, 2013; Cruz and Albuquerque, 2014). In those proposals, the influences of gaming had a limited role.

Arguably, they help to convince school gate keepers that digital games are not *intrinsically evil*, and that digital games may even be a *force for good* sometimes, thus justifying their presence in school. But besides this modest role, the influences of playing commercial games as entertainment in other spheres of players' lives has been less significant for my research.

It is often difficult to pin down when an idea emerges, but Buckingham's (2003) description of media literacy was one of the initial stimuli. The idea of creating spaces in school to educate *about* the media (in addition to educate *through* media, which is something different) struck me. It raised the important question: if we have time and resources to teach *about* games in schools, what would we teach? The background I was bringing with me led to the conclusion that the influences of gaming were something potentially valuable to be taught to students, even though it had not been the focus of academic game education discussions I had read. At that point I found how one piece of the jigsaw (influences of gaming) could fit in the other piece (games in education). Although the influences of gaming apparently had a minor relevance to other interfaces between digital games and education, merging the influences of gaming with the game education field seemed promising.

The next step was to organise knowledge about the influences of gaming (which often remains restricted to scholars and sometimes is spread through the work of journalists) and offer this knowledge to students. Although this short narrative might suggest the proposal appeared in a moment of insight, what actually happened was that the idea developed slowly, accompanied by the other pieces of the jigsaw such as the theoretical justifications, the expected outcomes, the practical activities, etc.

In conclusion, this thesis offers a proposal for game education that places the influences of gaming at the centre, which was theoretically justified and then empirically investigated.

1.1 Research questions

Four main research questions and four specific research questions framed the research of this thesis. The first one was a preliminary question, namely:

- RQ1. How do players understand the influences of their gaming practices?

This research question reveals the aim to understand players' perspectives about the influence of gaming prior to any intervention in order to design one. There is specific detail in the wording that I wish to highlight: the question addresses players' beliefs about *their* gaming, in other words, the focus is the influences of gaming applied to their own contexts instead of beliefs about influences in general.

There are two reasons why this question is particularly important for the thesis as a whole. As it will be described in the Literature Review (section 2.1), the perspectives of players about the academic claims of influences of gaming is often overlooked, so it was important to investigate this topic deeper, and in an approach that was in accordance with the later development of the thesis. In other words, the first rationale for this research question was the need to implement research to respond to the specific needs that my game education proposal created.

The second reason was that, according to my theoretical background, it seemed important to understand players' perspectives in order to design an educational intervention that is meaningful for them. As a player myself, I was at risk of projecting my own gaming practices (and my friends') into the potential learners; in which case to be to some extent an "insider" could offer problematic biases. My other bias was the academic literature, which depicts young players in a variety of ways, interpreted by the perspectives of each scholar. Therefore, in order to design an intervention for other players it was useful to hear and understand them better.

Two specific research questions were therefore developed to complement the first research question:

- RQ 1.1 What do players do with games?

This is a fundamental question that encompasses the games students play, for how long they play, and how they see their own gaming practice. The verb *do*,

in this case, encompasses what is described as gaming practices throughout this thesis. The role of this question is not central, but supportive to the other questions, because the other aspects investigated are relative to the games players play and how they play them.

- RQ 1.2 What are players' practices around the games they play?

This question addresses the practices *around* games, which in this case means game related practices (besides playing games) that are believed to have influences for the player. The practices around games that I chose to address in the study were (i) social interactions with peers and parents regarding games, (ii) online interactions about games (e.g. online game communities), (iii) the connections players make between topics perceived in games with topics perceived in schools, and (iv) tangential learning (i.e. the use of external sources to learn more about game topics). These topics were investigated because of their claimed potential to influence players.

The research questions above led to the Study 1 (chapter 4), which was based on qualitative interviews with players about their understandings on gaming. Studies 2 and 3 were characterised by the implementation of a course about the influences of gaming that I offered to players in schools and colleges, and these studies focused on the next research questions. However, because Studies 2 and 3 also promoted interactions with players talking about the influences of gaming, to a small extent they also informed the RQ 1 and its specific questions, thus contributing to the overall understanding of players' perspectives on the influences of their gaming practices.

The preliminary questions described above were followed by research questions that promoted the development of the game education proposal. Hence the second research question:

- RQ2 How can reflective gaming be taught?

This question allows for a multitude of answers. In fact, section 2.3 reviews many game education proposals, and they could be considered the answers to this research question given by other scholars. However, the function of the

research question in this thesis is to inspire the development of my answer to this question. Therefore, the term *reflective gaming* in the question is used here to indicate an engagement with games as it is aimed in the current proposal, namely, *reflective gaming* in this context means *to enrich gaming practices with informed reflections about the influences of gaming, which potentially leads to a voluntary change in the gaming perspectives and practices*. The specific research questions expand the second research question:

- RQ 2.1 What are the important aspects of a game education proposal?

This question addresses the reasoning process I undertook in order to formulate the game education proposal, which included the question about the reasons why each aspect of game education was important, and what it is useful for. Clearly, the important aspects depended on the theoretical framework used as reference. In other words, other researchers would probably answer the same research question differently, in accordance with their backgrounds. Therefore, the *important* characteristics should be considered important according to the theoretical framework used, as *importance* clearly varies according to the parameters employed.

The definitions of the important characteristics lead to the formulation of a game education model. This theoretical model was called the ICEED Game Education Model and emphasised five principles, proposing that the game education can be Informative, Critical, Empowering, Emancipatory, and Dialogical (ICEED). The ICEED model is explained in section 5.2, and used as foundations the Study 1 (chapter 4) and the literature reviewed (chapter 2).

- RQ 2.2 How can a specific course implement these characteristics?

This question addresses the operationalisation of the ICEED theoretical model into a concrete course, which was called Reflective Gaming Course (RGC). The RGC, I argue, implements the characteristics of the ICEED model, but clearly it is not the only solution. The RGC implements the ICEED model characteristics in a concrete model in order to investigate it empirically, however, the ICEED model has the potential to be implemented in other contexts following different solutions. Some alternative solutions are

mentioned in my final remarks in sections 8.4.7 and 8.4.8. However, this thesis will focus on the research on a specific set of activities, which is the RGC. In section 5.3 the design of the first version of the RGC is explained, but the design is improved during Studies 2 (chapter 6) and 3 (chapter 7).

- RQ3 How is the Reflective Gaming Course experienced by learners?

The third research question addresses the empirical investigation of the RGC. It focuses on one aspect, which is the experience of players. In the two opportunities I had to offer the RGC, students were observed, surveyed and interviewed. The findings generated allowed me to outline how students experienced the course with regard to their prior perspectives interacting with the designed activities, generating classroom interactions. This research question is particularly important for future adaptations, replications, or critiques to the RGC, because the answer to the question is the description of the learning ecology produced by the design of the course. Furthermore, the experiences of learners in the Study 2 (chapter 6) supported improvements of the course design for Study 3 (chapter 7). Similarly, the experiences of learners from both studies can support improvements of future versions of the course.

- RQ4 What are the outcomes of the Reflective Gaming Course for learners?

Whereas the previous question refers to the process of game education, this one addresses the outcomes of the Reflective Gaming Course (RGC). The intended outcome was the development of a more reflective gaming practice, in other words, that students would be able to and want to undertake informed reflections about the influences of their gaming practices, potentially changing their gaming perspectives and/or practices. This outcome is clearly difficult to assess in players, especially when it is the result of an extracurricular short course that requires a low level of commitment of students, and when the outcome manifests either in occasional conversations about games that players can spontaneously engage in, or in the gaming practices they engage in at home. Therefore, the answer to this question was primarily answered with self-report findings from the interviews with students after the courses had finished.

Those findings, which were generated in Study 2 (chapter 6) and Study 3 (chapter 7), suggested that the RGC has the potential to be a meaningful and relevant intervention to promote more reflective forms of engagement with games, as well as demonstrated a practical and usable course design based on the ICEED model.

In summary, the research questions began by asking about the players' perspectives (RQ1). Players' answers will be used to respond to the second question regarding a game education theoretical model (ICEED) and a course (RGC) that follows the model (RQ2). Then, the empirical investigation of the course answered the next research questions that addressed the process (RQ3) and the outcomes (RQ4), which in its turn informed back the theoretical game education model by demonstrating whether and how it has the potential to work in practice.

1.2 Outline of the thesis

The thesis is divided into eight chapters:

- Chapter 2 Literature Review

The literature review is divided into two sections. The first one outlines the literature on the influences of gaming, highlighting the limited presence of players, both as *agents* who can interfere with the influences of their gaming practices and as *learners* who can learn about the influences of gaming. The review of the influences of gaming is essential because students were asked about them in Study 1 (chapter 4), and also because the academic literature regarding the influences of gaming was adapted to be taught in the RGC.

The second section describes the theoretical framework. It includes both some of the underpinning theories regarding educational philosophy and the proposals of game education available in the literature. This section is important because the theoretical framework both (i) guided the decisions about how the ICEED Game Education Model was defined, and also (ii) showed the gaps in the literature to which the ICEED model responds.

- Chapter 3 Methodology

The methodology chapter is divided into five parts. It begins by (i) describing a pragmatic epistemological approach taken to the research; then (ii) explains the methodological overarching framework of the thesis, namely, Design Based Research; (iii) explains how the structure of the thesis fits in the model proposed by a Design Based Research approach; (iv) describes the specific methods that were used throughout the thesis, including data generation, analysis and presentation, and finally (v) discusses topics related to ethics. The reader should keep in mind that the specific methods employed in each of the three studies are only summarised in this chapter, because they are described in detail in the chapter of their correspondent studies.

- Chapter 4 Study 1: Players' Perspectives

This chapter describes the first study of the thesis, which investigated the perspectives of 15 players employing individual, semi-structured interviews, addressing mainly their perspectives on the influences of their gaming practices. This study revealed how players can differ from each other with regard to their perspectives on the influences of gaming, as well as the absence of many academic claims in their discourses. It also offered many illustrations of possible perspectives. The findings of this study supported the design of the RGC in the next chapter.

- Chapter 5 Game Education Model and Course Design

This chapter is divided in two parts: the first part described the ICEED Game Education Model, which was created using the discussions outlined in the literature review (Chapter 2) as inspiration and foundation, responding to the gaps perceived. The second part employed (i) the literature on the influences of gaming, (ii) findings of Study 1 (Chapter 4) and (iii) the five principles of the ICEED model to design the RGC, which is a practical design to empirically investigate the ICEED model.

- Chapter 6 Study 2: The Reflective Gaming Course

This chapter describes the first empirical investigation of the RGC. The course was implemented in a school with a group of eight male students (approximately 15 years old) as an extracurricular activity, and the students were interviewed individually after the course and surveyed individually in the end of each session. The findings suggested many changes to the RGC, which was improved accordingly.

- Chapter 7: Study 3 Iterating the Reflective Gaming Course

The improved version of the RGC was implemented for the second time (i.e. the first iteration of the course). It involved the participation of 14 male students (approximately 17 years old), who attended to the RGC offered in a college as an extracurricular activity. Students were interviewed individually both before and after the course, and the interviews included a short session of game play and questions regarding their perspectives about the game. Students also answered individual surveys at the end of each session, and were observed during the sessions by another observer in addition to myself. The findings of this iteration suggested how the RGC can be implemented with positive outcomes, and also provided more insight about the ICEED model, about the RGC and how students interact with both.

- Chapter 8: Discussion

This chapter is divided in five parts. The first three parts describe the final reflections about the main contributions of the thesis, namely: the players' perspectives on the influences of gaming, the ICEED Game Education Model, and the Reflective Gaming Course. This final discussion encompasses the findings of all studies of the thesis, which complements the discussions carried out in the final of the chapter of each study. The fourth part describes the limitations of this doctoral research, and the fifth describes concludes the thesis by summarising the implications.

2. LITERATURE REVIEW

This literature review is divided into three parts: influences of gaming, educational theory employed, and previous approaches to game education.

The first section (2.1) covers research that has addressed potential positive and negative influences of gaming. This thesis is fundamentally concerned with reflective gaming and how it can best be taught (RQ2). Consequently, this section is required as it describes and analyses the literature that has addressed the influences of gaming on players. It is partly from this literature that content of the course was developed. Furthermore, as Study 1 explored players' perspectives about the influences of gaming, questions were developed and answers analysed in reference to this literature.

The second part of the chapter explains the theoretical framework that helped to shape my underlying educational approach to game education: what education can be and what it can help students to become. I consider this literature to be the fertile ground of educational philosophy on which the seed of game education was sown. Consequently, it underlies not only the ICEED model and its instantiation within the RGC, but the content and the learning activities included in the sessions and the intended outcomes for students (RQs 2,3,4).

The third part of the chapter presents and critiques the literature regarding existing approaches to game education and game literacy. In order to answer the research question about how reflective gaming can be taught (RQ2), this doctoral research used previous approaches to game education as a foundation. This is used to build a new model of game education that draws upon the educational philosophy (explained in Section 2.2) and which focussed on both positive and negative aspects of gaming (Section 2.1).

2.1 The influences of gaming

The review of the literature regarding the influences of gaming plays two roles in this thesis. The first is to support a fundamental premise of the thesis, namely, the argument that game scholars have offered plenty of claims about

the influences of gaming, and that there is increasing research findings to support some of those claims. Consequently, there is a growing body of knowledge that can inform players about the potential influence of their practices.

One of my interests regarding this topic is how much players understand and are aware about the influences of gaming, in addition to the academic findings about the influences *per se*. It is expressed in the research question about the understandings of players about the influences of *their* gaming practices (RQ1). This emphasis is intended to allow the reader to begin to see the small but growing interest expressed in the literature about the player understandings and awareness about the influences of gaming.

It is important to clarify what I mean by *influences of gaming*. Salomon and Perkins (2005) make a useful distinction between the ‘effects *with* technology’, and ‘effects *of* technology’. They conceptualise ‘effects with technology’ as the effects that technology has on the activity itself, such as the performance improvement of using a word processor instead of handwriting. In the specific case of digital games, I interpret that the effects *with* games would concern, in most cases, the quality of the entertainment element of gaming. Alternatively, the effects *of* technology are the effects that this thesis focuses on, and Salomon and Perkins suggest that they “concern effects, positive or negative, that persist without the technology in hand, after a period using it” (p. 77). They also emphasise that the effects of technology implies some kind of transfer of skill, thus the technologies should “allow applications that transcend the technology-related context” (p. 77). Although this division of Salomon and Perkins clarifies what is meant by the effects *of* gaming in this thesis, the term *effect* raises an inconsistency. In media studies (which was one of the main influences in the development of media education), the term effect is frequently associated with over simplistic approaches to research negative effects of media, which tends to underestimate users in general and children in particular. Gauntlett (1998) outlines some of the main flaws of the so called “effects model”, and elaborates tentative alternative terms such as “*influences* and *perceptions*, rather than *effects and behaviour*” (p. 128) to lead to research

approaches that address the matter with more property. Because the proposal of this thesis encompasses a variety of perspectives thus extrapolating the limitations associated with the term *effect*, the term *influence of* will be used. This is more in accordance with the perspective expressed by Stevens, Satwicz and McCarthy (2008) when they conclude their ethnographic study by emphasising the potential active role of players in influencing how they are influenced by gaming:

An “answer” to the question of how media consuming and repurposing has affected these young people is complicated and contingent; it depends on differing dispositions and purposes that people bring to play, who they play with, and perhaps more importantly what people *make* of these experiences in other times and places in their lives. By emphasizing this active role of making something of game playing experiences, we are stepping quite far away from any simple generalizations about effects of video game play. (p. 63)

Amongst the influences of gaming addressed in this literature review, the topic of excessive gaming does not fit in a strict definition of *influence of* gaming here proposed. As was explained earlier, the reason why the influences of gaming are covered here is because the main premise of this thesis is that the influences can be worth teaching in a game education proposal. Similarly, excessive gaming seems to be a widely spread and concrete concern associated with gaming, which surely has the potential to influence other spheres of players’ lives. Its relevance was perceived by authors who wrote alternative proposals of game education focusing on that topic, such as Moumoutzis et al. (2014) and Klimmt (2009). Consequently, the topic of excessive gaming was included as influence of gaming despite its difference to the other influences, due to its potential as a topic to be addressed in a game education proposal. In a sense, it does not fit in the description of “effects of” technology according to Salomon and Perkins (2005). Strictly speaking, excessive gaming is a potential *cause* of influences, and not the influence *per se*. Despite dangers of repetitive strain injury and similar issues, the main influence discussed here is the player

not doing other activities, even though it is only hypothetically negative – for instance, the player could engage in some harmful activity instead of gaming, in which case excessive gaming would be the cause of a positive outcome. To avoid further speculation regarding a topic that is experientially very concrete to players, I will simply treat excessive gaming similarly to the other influences of games.

To summarise, the influences of gaming addressed non-exhaustively in this chapter refer to influences on the player which potentially transfer to non-gaming contexts, as well as excessive gaming. And the perspectives of players about those influences will be addressed in the literature when possible.

The next sections will begin to address the influences of gaming by the ones generally considered negative: excessive gaming, violence, and sexism and racism. It is followed by the ones generally considered positive, divided in two categories: learning on a skill level, and on a personal level. Finally, the review regarding the influences of gaming ends with the description of other practices related to gaming (besides playing games) that the literature describes as positive (or, sometimes, negative). The practices covered in that last section are use of external sources to learn; interactions amongst players, design practices and making connections between games and schools.

2.1.1 Potential negative influences of gaming

There are a variety of problems associated with gaming. This review will cover three areas, excessive gaming, violence, and racism/sexism, as these were the ones that are most relevant do the empirical studies reported in Chapters 4, 6 and 7.

2.1.1.1 Excessive gaming

Kutner and colleagues (2008) conducted focus groups with 12-14 year old boys and their parents about the influences of gaming, and excessive gaming was the most prominent concern of parents. Excessive gaming was seen as a problem in different degrees, from minor distractions to severe consequences in the performance of other activities – such as study and work. Researchers

tend to be more concerned with the latter, employing different methods to draw a line that defines when a case is worth worrying. This has been researched using a variety of approaches: Gentile (2009) employed an online survey questionnaire with twelve items adapted from the gambling sections of the Diagnostic and Statistical Manual of Mental Disorders (IV), published by the American Psychiatric Association. Some examples of the items are: “Have you tried to play video games less often or for shorter periods of time, but are unsuccessful?” and “Do you sometimes skip doing homework in order to spend more time playing video games?”. It is arguable whether these are good indicators, but at least they are adapted to gaming. Some items, such as “Have you ever stolen a video game from a store or a friend, or have you ever stolen money in order to buy a video game?” (all items from p. 598) are quite extreme. If the player exhibits at least half of those symptoms, Gentile considers her/him to have a pathological gaming practice, which he found to be the case of 8% of the sample of his study with 1,178 American participants aged from 8 to 18. Grüsser, Thalemann and Griffiths (2007) employed a different method with 7,069 respondents who filled an online questionnaire in a game magazine website, and they found that 12% of them fulfilled diagnostic criteria for addictive behaviour. The paper ends with advice of cognitive-behavioural interventions to treat “excessive gamers”. Skoric, Teo and Neo (2009) asked 333 children with age from 8 to 12 to complete eleven items on Likert scale to measure addictive tendencies, and correlated this with the amount of hours spent gaming and with their school grades in English, Science and Maths. They found that school grades were negatively associated with addictive tendencies, but not associated with amount of hours played. However, in the case of English scores, students with higher number of hours had a positive association with English scores. The authors used the findings to highlight that a high numbers of hours playing games does not necessarily mean that the player has addictive tendencies, and nor does it necessarily equate to poorer scholastic performance.

Excessive gaming has also been researched using an experimental approach. Weis and Cerankosky (2010) gave video games to 32 boys between 6 and 9 years old who had not had played video games before, and compared their

school performance with a control group for four months. Whereas there was no significant difference in their mathematics scores, the experimental group had a lower score in reading and writing; the authors argued that games may have displaced other after school activities that have educational value, such as doing homework. Weis and Cerankosky end the paper hoping that their findings “can be added to this growing body of research so that parents can make informed choices regarding their family’s media consumption” (p. 7). They ignore work from other studies offer contrasting findings, such as no correlation between gaming hours and school grades (Skoric, Teo, and Neo, 2009) and that in longitudinal studies game play was evaluated as a positive practice, including in school-related measures (Durkin and Barber, 2002). Those findings suggest that perhaps Weis and Cerankosky’s study applies only to the initial excitement of owning a video game, in the case of boys who apparently were partially excluded from this aspect of digital cultures previously, which contrasts with the generalisation that they apparently intend to make.

Despite the fact that the studies above researched mainly with children, it can be noted how the possibility of players – who can belong to practically any age group – taking informed decision about their practice is not taken into account. The studies described their value for parents and psychotherapists only, who have the option to intervene with the players’ practice somehow.

In spite of the significant body of research in this area, the dominant ideas outlined above are not uncontested. Wood (2008) reminds us that the term addiction is misleading and technically not appropriate, as organisations such as the American Psychiatric Association and others do not have clinical criteria for game addiction. The adaptation from the criteria to measure other addictions to gaming, he argues, has the potential to “result in a significant overestimation of the prevalence” (p. 170), which is worrying due to the way parents, partners, friends, teachers and policymakers can understand the issue. Without denying the actuality of the issue of excessive gaming, he uses four study cases to problematize the misuse of the term addiction and highlights how these criteria oversimplify a problem that may have roots in other social

and cultural sources. Unusually, he also mentions the importance of raising *player* awareness about those issues in order to help “individuals to more fully understand both the nature of their own game playing, and the gaming behaviour of others” (p. 177).

In conclusion, the problem of excessive gaming can hardly be denied. The differences in academia seem to be subtle. For instance, in some cases games are portrayed as a highly risky activity compared to other addiction activities such as drugs or gambling, as traps that were designed to capture players. In other cases gaming is seen as a media practice that, similar to many other activities, can be harmful if done excessively but does not justify social panic. To players, it seems that both an unreasonable fear of getting “addicted” or to ignore completely the issue can jeopardise a balanced gaming practice.

2.1.1.2 Violence

The influence of violence in games probably has been the most polarised discussion within academic debate on games. On the one hand, a tradition of research states that there is a direct link between exposure to violent video games and aggressive affection, behaviour and cognition, based on a research basis that includes experimental, longitudinal and correlational studies, both in laboratories and in naturalistic settings (Anderson and Bushman, 2001; Anderson et al., 2010).

But on the other hand, there is considerable methodological criticism of such studies, such as the ones described in Ritter and Eslea (2005) and Ferguson (2010a), who point out many flaws that are recurring in the literature, especially with validity issues with the methods employed. There are also findings that problematize the claims of the direct influence of violent gaming in aggression. Other variables may also be involved, suggesting that the phenomenon is more complex than a simplistic causal explanation would describe. Unsworth, Devilly and Ward (2007) found that depending on the feelings immediate before and the personality traits of the player, playing violent games either increases, decreases or has no effect on trait anger (measured using the STAXI questionnaire). Ferguson (2010b) conducted a

study including a set of two questionnaires to 302 young people, which addressed depressive symptoms, antisocial traits, family violence, peer delinquency, media violence, and others variables. He found that neither video game violence exposure, nor television violence exposure, were predictors of serious violent acts of youth.

Another aspect of gaming is in its potential competitive nature, which some authors suggest to be a more important factor for latter aggressive behaviour than depictions of violence (Adachi and Willoughby, 2011; Ewoldsen and colleagues, 2012). Moreover, Velez and colleagues (2014) present experimental data suggesting that the levels of aggression after playing was similar to not playing when the game was played cooperatively, in contrast to increased levels of aggression in solo modes or competitive gaming. They suggest that playing collaboratively might be an alternative to counter increased tendency for violence due to violent games.

Some authors contest more emphatically the assumption that the increase of aggression in the context of gaming is related to an increase in violence in society – and especially youth violence. Ferguson (2015) analysed the most popular game titles from 1996 to 2011 and compared it to youth violence data from the same period, and found an inverse relationship, i.e. popular games were becoming more violent while data showed that youth violence decreased. Despite its limitation in terms of causality, this does argue against the view that increasing levels of violence in gaming results in increase in youth violence.

Jones (2003) points out the problems of creating public hysteria and raising children with an excessive fear of fictional violence, denouncing the common underestimation of players' capacity to carry out complex understandings of fictional violence and its role in their development (e.g. to build up self-confidence). Similarly, Olson, Kutner and Warner (2008) conducted focus groups with boys about violent games. The boys described to use violent games to help them to cope with emotional difficulties out of the game, sometimes to release tension and aggression. This illustrates how asking players and treating players as more than passive recipients can offer new perspectives on the influences. Moreover, Olson, Kutner and Warner (*Ibid.*)

also found that boys often have complex understandings of how violence and other so-called negative aspects of media (e.g. swearing) can influence children, even though it was observed a “third person effect”. In other words, the boys often believed that the negative influences of gaming affected others, but not themselves. Scharrer and Leone (2008) specifically investigated the third person effect in violent games. They found that the third person effect becomes stronger when the fictional player was younger than the participants, and that in many cases they believed they should be allowed to play the game despite admitting that it influences the player. In the focus groups of Kutner and colleagues (2008), however, parents did not believe that their sons could be influenced by games to make violent acts in real life, but both boys and parents showed some concern with decrease of sensitiveness to violence and beginning of beliefs that the world is full of violence.

In summary, the debate about the influences of violent games is polarised, and this polarisation makes the research field confusing. It seems difficult to deny the potential for violent games to cause aggressive cognition and affect, and I do not remember reading any scholar defending that all age ratings should be completely banned. The pivotal point of debate seems to be concentrated on whether games can be blamed as one of the main causes for serious violent behaviour. With this regard, there seems to be no evidence to support this belief, which does not mean that studies are not pointing towards more subtle and diverse influences. The presence of polarised views about this topic increases the potential for misinformation and confusion, and therefore it seems particularly positive if this topic is discussed in schools rather than allow students to make conclusions unsupported. In this doctoral research, I considered it more important for players to understand the debate about the topic than to reinforce a polarised position about the topic (i.e. completely ignoring either side of the debate). In this way players can avoid to be overly afraid of the influences of violent games while also acknowledging that some age restrictions are reasonable according to the current research status.

2.1.1.3 Sexism and racism

Both everyday experience and existing research suggests that there are sexist and racist biases in character representation in the game industry. Williams and colleagues (2009) made a census of game, counting the character of 150 games (using the most sold games in nine different platforms, from the year 2005 to 2006) with the results weighted according to the sales of each title. They then compared their game census to the United States census, and found that women are massively underrepresented both as primary and secondary characters. There is also a dominance of white characters, and a particular absence of Hispanics and Native Americans. They conclude that “the world of game characters is highly unrepresentative of the actual population and even of game players” (p. 831). Studies also suggest that games often mirror stereotypes in the representations of characters who are not white males. Burgess and colleagues (2011) analysed 149 video game covers and found that racial “minorities” are more likely to be portrayed as aggressive, dangerous or as athletes. Everett and Watkins (2008) argue that many games draw from racist discourses circulating in culture and intensify it within gaming environments, with the excuse of being authentic, in this way producing “some of the most powerful, persistent, and problematic lessons about race in American culture” (p. 142).

Regarding gender, Dill and Thill (2007) analysed images from six top selling game magazines, and found that females are massively more sexualised than males, and those representations frequently reproduced dominant sex role portrayals, i.e. male characters being hyper-masculine and female being classified as “visions of beauty”. Obviously representation problems of these kinds are also present in other media, but it does not nullify the impact of their presence in the game industry. In the focus groups with boys and parents conducted by Kutner and colleagues (2008), although gender and race representation was considered a problem by some parents, apparently they worried more about nudity in games than about stereotypes or lack of representation. Ironically, the opinion of the boys (aged 12-14) about nudity was described as follows, despite their experience with mature games:

Boys had much less to say about sexual content in games. A number of boys expressed disgust at the idea of nudity in games, and many said that they had not realized that any video games included sexual content. (p. 88)

Moreover, Carr (2006) describes how the game industry – with its representational choices, marketing strategies, etc. – reinforces a process of alienating girls from the gaming culture, which may or may not be related to a lack of girls' later interest in technology and science, and the perpetuation that games are for boys due to a “natural” inclination.

There are also studies about the influences of such problematic representations. An experiment conducted by Dill, Brown and Collins (2008) exposed 181 participants to images of women, whereas the experimental group was exposed to sexualised game images and the control group was exposed to images of women in professional contexts. Both groups were asked later to make judgments about a fictional case of sexual harassment against a woman, and results showed that the experimental groups answered differently from the control group. Male participants were more tolerant towards sexual harassment after being exposed to sexualised images of women, while female participants were less tolerant after the same exposure. After interviewing and surveying 87 young people Brenick and colleagues (2007) found that males and players who were highly involved with games tended to be more accepting of gender stereotypes, and there was a recurrent belief that what is represented in games does not affect players in any sense. With regard to race, Rodríguez-Hoyos and Albuquerque (2015) analysed 976 online forum posts discussing racism in games and found that despite the presence of heated debates that include criticism to racist representations, discourses that defend racist representations were widely present: for example, posts reject so-called “political correctness” and “exaggeration”, or justify racist representations in different ways (e.g. the idea that white dominance is what the audience wants). Furthermore, Madill and Sanford (2007) observed through interviews with boys that critical reflection of what is depicted in games does not seem to occur naturally,

suggesting a less reflective game practice than the one suggested by Gee (2007) and Squire (2011):

...we argue that unless taught how to notice and critique the social values and assumptions in a game, video game players are mostly unaware of the broader social practices embedded in video games content and play. Video games are not created to allow for reflection or contemplation of values. (Madill and Sanford, 2007, p. 449)

To summarise, it is clear that games – more or less similarly to other media – often employ stereotypes of race and gender, or have little representation of female and non-white characters. There is evidence suggesting that it is a problem with consequences beyond the gaming context, and although there are strong defenders of the maintenance of a game culture that perpetuates sexism, racism and other forms of oppression devices (e.g. supporters of the “#GamerGate” controversy), it hardly finds space in academic discourse. Apparently game scholars can sometimes overlook the topic, but hardly argue against it like the previous negative influences described. In this thesis, these representation problems are considered important to be addressed by players, responding to the statement of Madill and Sanford that unless we address those topics directly, critical analyses of games are hardly undertaken. This need is reinforced by studies that suggest that players often ignore, underestimate the relevance of it, and sometimes even reinforce the oppressive systems instead of challenge them.

2.1.2 Potential positive influences of gaming

Alongside the development of perspectives that demonise games, the last decades also saw the development of ideas regarding the beneficial aspects of gaming. Johnson (2005) called this development as the *sleeper curve*, which he described as the delayed perception of society of the positive values of innovations. Digital games with their challenging and complex problems to be solved were included in his description of this paradigm shift.

There are benefits from gaming that do not fit in the description of the influences of gaming as understood in this chapter. For instance, Durkin and Barber (2002) conducted a longitudinal study with data from 1304 young people over a period of six years (1983-1988). In most indicators surveyed, players had better scores than non-players. Their study found that players presented better results than non-players in areas of: (i) family closeness, (ii) positive school engagement, (iii) positive mental health, (iv) substance use, (v) self-concept, (vi) friendship network, and (vii) disobedience to parents, which made the authors conclude that gaming is “one manifestation of an active and well-adjusted lifestyle” (p. 389). However, they also found that players with low involvement with games scored better than the ones highly involved. However, this study is not clear about the relationship between those measures and the influence of gaming as it is considered here: as transferable influences that remain with players after they stop playing. Thus those kinds of benefits – including the benefit of making friends and strengthening social bonds – were not chosen to be the focus of the studies of this thesis. Despite its relevance, they refer less to a transferable learning or skill. However, it can be further explored in future studies.

To organise the positive influences of gaming a taxonomic division is helpful, and so an adapted version of the Gaming Involvement and Informal Learning (GIIL) framework (Iacovides and colleagues, 2014) is employed. The GIIL framework is relevant to this study because it includes a wide variety of aspects in a broad concept of learning. The framework was built based on a series of interview with players, and divides informal learning in two spheres: the first is *how* players learn, and the second is *what* players learn. In the first division, how player learn, Iacovides et al. offer three categories:

- learning through play,
- through interacting with others outside of play, and
- through external sources, such as game paratexts (e.g. game forums and magazines) and tangential sources (e.g. sources of information about game themes).

In the second division, *what* people learn, they also offered three categories:

- on a game level (sub-categories: controls/interface, content, strategies, behaviour of others, games in general),
- on a skill level (sub-categories: psycho-motor, cognitive, social, numeracy, literacy, technical) and
- on a personal level (sub-categories: general knowledge, emotional development, cultural development, and career influence).

Other authors used alternative strategies to categorise the positive influences of gaming. Similarly to Iacovides and colleagues, Turkay and Adinolf (2012) divided the survey answers of 796 respondents in four categories regarding *how* players learn, namely: (i) from game mechanics, (ii) from game narratives, (iii) from each other, and (iv) through tangential sources. They also had two categories regarding *what* players learn: the kinds of skills (i.e. social, motor and spatial, cognitive) and kinds of knowledge (declarative or procedural). Granic, Lobel and Engels (2013) reviewed some of the benefits and divided in cognitive, motivational, emotional, and social. Some authors described lists of benefits with no specific framework, such as Greenfield (2009), Gose and Menchaca (2014), and Cruz, Ramos and Albuquerque (2012). From the strategies above, an adaptation of the framework by Iacovides et al. seemed the most suitable to my research, because it offered a detailed organising structure that echoed some of the ideas behind my own studies (e.g. tangential learning).

Contrastingly to negative influences, the positive ones seems to more frequently be based upon what players consider about what they learn. In fact, some studies (e.g. Gose and Menchaca, 2012; Cruz, Albuquerque and Ramos, 2012) are based solely on self-report, which obviously bring specific kinds of limitation. Another example is found in Iacovides and colleagues (2012), who found that higher involvement with games and self-identification as gamer were related to more feelings and beliefs of gaining something from gaming. However, their findings cannot clarify whether they gain more benefits from gaming, they have a more optimistic perspective on that, or they just elaborate more on the idea.

2.1.2.1 Learning on a skill learning

This section covers cognitive, psycho-motor, social, numeracy, literacy and technical skills. Some of these definitions touch on complex areas of study, such as numeracy and literacy. To the scope of this thesis, however, these will only be used as organising parameters of the influences of gaming literature, and will be interpreted simply as skills related to reading and writing (literacy) and skills using numbers (numeracy), rather than a wider meaning to the terms.

There is plenty of research with regard to *cognitive gains* of gaming, with a few indicating *psycho-motor* benefits as well. Addressing both categories, the experiment described in Kuhn and colleagues (2014) found that playing *Super Mario 64* (Nintendo, 1996) for approximately 30 minutes for two months resulted in brain changes that are associated with improved spatial navigation, strategic planning, working memory and motor performance. There is also self-reports of psycho-motor benefits in Iacovides et al. (2014), Cruz, Ramos and Albuquerque (2012), and Gose and Menchaca (2014). These studies also found self-reports of cognitive skills. However, the evidence for cognitive benefits go beyond self-reports: there is experimental evidence suggesting that action game play can enhance spatial resolution and visual performance (Green and Bavelier, 2007; Spence and Feng, 2010), increase the speed of processing with no decrease in accuracy (Dye, Green, Bavelier, 2009a), improve attention skills (Dye, Green and Bavelier, 2009b), and develop quicker and more efficient evidence based decision making (Green, Pouget and Bavelier, 2010). There is also evidence that there is a correlation between game playing and creativity, based on a survey with 491 respondents (Jackson and colleagues, 2012). Adachi and Willoughby (2013) conducted a longitudinal study with 1,492 young people for four years. Furthermore, the findings suggest that playing role-play and strategy games predicted self-reported problem solving skills over time, and this (self-reported problem solving skills) predicted academic achievement. Some of the other claims made for gaming are that it has the potential to develop skills related to risk taking (Shaffer and colleagues, 2005), innovative solutions (Shaffer, 2006) and others. Many of those skills were also reported by players in the list of Gose and Menchaca

(2014). Clearly, there are criticisms that could be made about particular studies – for instance, about the definition of “creativity”, or the value of correlational data – and this kind of informed discussions could be undertaken in classrooms, where it would be more likely to occur than in short internet articles or similar mediums, which often spread ideas about gaming and cognition.

The idea that a variety of cognitive skills can be developed through game play inspired some researchers to propose that perhaps instead of developing a wide array of specific cognitive skills, playing video games can actually train players to learn more effectively, in a broader sense (Bavelier and colleagues, 2012; Green and Bavelier, 2012). It seems that Bavelier and colleagues used a body of empirical, mostly experimental, data to reach a tentative conclusion that concurs with what Gee (2007) suggested after analysing the learning principles employed by games: that playing “good” games allows players to practice learning in productive, active and critical ways, hence learning *better*.

With regard to *social skills*, studies suggest that gaming develops social skills, although it is difficult to find evidence corroborating if and how these might transfer to other contexts. Research into the development of social skills related to gaming are mainly focused on massive multiplayer online games (MMOs). MacCallum-Stewart (2011) described the use of team work and cooperative skills in a case study with World of Warcraft (Blizzard Entertainment, 2004) players. Steinkuehler and Williams (2006) combined a variety of qualitative and quantitative methods to suggest that players of massive online games have the chance to develop bridging social capital. Jang and Ryu (2011) found that online and offline self-reported leadership were related, suggesting that massive online games may provide opportunities to develop leadership skills that are analogous to offline leadership. There are also self-reports about learning communication and interpersonal skills (Gose and Menchaca, 2014).

There are self-reports of *numeracy* learning, such as in some of the interviewees of Iacovides and colleagues (2014) and Turkay and Adinolf (2012). The latter found that 37% of the 769 survey respondents declared that

they had learnt something related to statistics and mathematics, which was the most frequent topic they mentioned.

Concerning *literacy*, ethnographic studies have described the literacy practices of young people in games, such as Marsh (2011) and Gillen (2009), suggesting analogies between the literacy uses in formal contexts and games. In a survey responded by 333 children aged 8 to 12 in Singapore, Skoric, Teo and Neo (2009) also found that gaming hours were positively related to English school scores. There were also self-reports related to literacy: reading comprehension skills appeared in the study of Gose and Menchaca (2014); vocabulary and foreign language was the second most cited topic in the study of Turkay and Adinolf (2012), and English as a foreign language was the most cited in Cruz, Ramos and Albuquerque (2012) and in the interviews conducted by Vintetjärn (2008).

There were also some register of self-reported *technical skills* in Iacovides and colleagues (2014), Cruz, Ramos and Albuquerque (2012) and Gose and Menchaca (2014); however, those seem to be less prominent than other skills.

In Study 1 I was interested in investigating a wide range of learning on a skill level. However, the cognitive and psycho-motor aspects seem to be the areas that received most attention of game scholars, arguably becoming the most consolidated categories in academia. Consequently, amongst the learning on a skill level categories, cognitive and psycho-motor were chosen to be included in the Reflective Gaming Course. One challenge to adapt this knowledge to players is that despite the evidence suggesting some psycho-motor and cognitive gains, how those can be used by players in their daily decision making is still under investigated.

2.1.2.2 Learning on a personal level

This section addresses learning regarding general knowledge, emotional development, cultural development and career influence.

The first category of learning on a personal level is *general knowledge*. Malliet (2006) interviewed 32 players about the feeling of realism in games, and

connection between games and knowledge about “reality”. In some cases, it is sceptically reported as a very loose and rare connection, and sometimes reported cases of accurate representations of reality. Malliet concluded that:

The apparent contradiction between disbelief in games’ syntactical capability to provide information about reality, and belief in several aspects of games providing a more or less accurate depiction of specific parts of reality, demonstrates that gamers are very active in comparing games to reality, and do not take it for granted that a game offers a window on reality.
(p. 384)

The most common example of knowledge associated with gaming is historical knowledge. It is mentioned as an illustration of general knowledge in the GIIL framework (Iacovides et al., 2014), and by 9% of the survey respondents in the study of Turkay and Adinolf (2012).

One perspective about the learning of general knowledge from gaming is given by Gee (2007), who criticises schools for an overemphasis of content. Contrastingly, he argues that playing “good” games allows players to experience a world through lens of specific knowledge domains, “developing resources for future learning and problem solving in the semiotic domain to which the game is related” (p. 38). In this context, learning about history could mean to become familiarised with what he called the *design grammar* of history, in other words, understand the structures of historical knowledge. In a similar perspective Squire (2011) describes how the game Civilization (Micropose, 1991) can stimulate reflections about history. In fact, Squire suggests that players “naturally” make those connective questions, and that this kind of learning through game inquiry is “addictive”, even though he highlights the value of classroom debriefing of gaming experiences.

Some studies investigate claims that fit in the category of *emotional development*. This term will here include topics related to ethics, such as in the study of Simkins and Steinkuehler (2008), who conducted an ethnographic study mapping the opportunities players have to practise ethical decision-

making in games. In contrast to the studies about violent games, Gentile and colleagues (2009) describe longitudinal and experimental evidence suggesting that playing prosocial games encourages prosocial behaviour in children and young people. Lenhart and colleagues (2008) found characteristics such as civic engagement and political interest are correlated with both playing games with civic experiences and playing games with others in person (no correlation was found between playing games with others online). Further research is needed, however, to clarify the direction of causality. With regard to identity formation, the ethnographic study of Stevens, Satwicz and McCarthy (2008) found that gaming practices can be entangled with how social relations are created and how players see each other:

The identities being crafted through game play are in fact real-world identities that are crafted as young people compare their actions in-game, and their consequences, with the consequences those same actions would have in the real world. (p. 59)

The topics of *cultural development* and *career influence* are not frequently addressed in the literature. Although, Iacovides and colleagues (2014) found examples amongst the participants of their studies, this was not the case of survey studies investigating self-report learning, such as Cruz, Ramos and Albuquerque (2012), Turkay and Adinolf (2012), and Gose and Menchaca (2014).

Amongst the possibilities of learning in a personal level, there seems to have less systematic evidence regarding learning in a personal level than the ones on a skill level. It might be that learning on a personal level is particularly personalised, hence difficult to research and generalise. Perhaps the ways that players make sense and transfer lessons from gaming to other areas is very subjective and diversified. Yet, the categories of general knowledge and emotional development were considered to be more present in academia, and this influenced the decisions about the focus of the Reflective Gaming Course.

2.1.3 Game related practices

The previous sections described influences from playing games. This section describes alternative ways that players can learn besides by playing the game, in other words, explores the alternative categories of *how* players learn from the GIIL framework, which are not through play. Therefore, the focuses are the practices that can have influences on the player. To contextualise, the kind of influence will also be mentioned. However, the emphasis is in the activities that generate those influences. In addition to the subcategories described originally by Iacovides and colleagues (2014), i.e. learning through external sources and through interacting with others, I added two other non-playing practices that can be associated with learning: design practices and connections between schools and gaming.

The uses of *external sources* that I refer in this thesis are the ones that refer to topics beyond gameplay, i.e. it does not refer to the game paratexts that support the game play. There is little research about practices of employing external sources to learn about topics besides the game itself. The YouTube video of Portnow and Floyd (2008) “Video Games and Learning” proposed to call this process *tangential learning*; and it was taken into account by Iacovides and colleagues (2014) when they proposed the GIIL framework. Turkay and Adinolf (2012) also found that players described learning a variety of topics through searching for external sources. Whitton (2014) considered it as one of the eight ways to conceive how games and learning are related. She describes it as *learning inspired by games*.

Their participation in online communities is claimed to provide benefits for players, and fits in the category *learning through interacting with others*. Thorne, Black and Sykes (2009) found that in online communities students often engage in extended and sophisticated language uses, which allows students to use language in ways that are not frequently used in the classroom. Gee (2007) describes the creation of affinity groups, where players with similar interests employ a shared language in a way that is contextualised and specialised. Steinkuehler (2007) argues that the massively multiplayer online game environments allow players to engage in a constellation of literacy practices, rather than competing against the informal literacy practices of

young people as some scholars would fear. Steinkuehler and Duncan (2008) analysed forum discussions of World of Warcraft (Blizzard Entertainment, 2004) and suggested there the posts reveal a collaborative knowledge production that has the potential to foster scientific habits of mind in participants, in their words: “Eighty-six percent of the forum discussions were posts engaged in “social knowledge construction”” (p. 531). However, Iacovides and colleagues (2012) noticed that most players seem to use those online communities to retrieve information, rather than actively participating, which arguably would limit the claimed benefits.

The idea that benefits can be taken for granted regardless of the kind of practice undertaken – either gaming and gaming related practices – is disputed by Steinkuehler (2015), who also emphasises the relevance of the interactions with others in order to tap the potential benefits. She said: “My own research only emphasizes this point: It is particular forms of talk around commercial game titles that make them such powerful vehicles for learning” (p. 2). Steinkuehler is probably referring to talks about games, not necessarily talks about the influences of gaming. In the latter case, Williamson and Facer (2004) described the talk that players have about games, which has no mention of the influences of gaming. They found that the conversations refer to:

...the relative merits of different game and consoles, the exchange of cheats and strategies for completing games, as well as the different on-screens ‘events’ that make up the experience of playing games. Notably, such talk around computer games was often characterised by high levels of competition between children concerning which games and consoles were the ‘best’

(p. 260)

There are also a variety of activities that can be described as *design practices*, like map creation, modding (modifying the codes of existing games), fan fiction, fan art, and game creation. Tobin (1998) illustrates how gaming can encourage the development of design skills (e.g. web design) in activities related to the game culture. About game creation in particular, Kafai and Peppler (2012) suggested that creating games help to develop game fluency,

which they conceptualised as competencies in three spheres: creative, critical and technical. Zimmerman (2007) describes three skills potentially developed by game creation: understanding of systems, understanding of play, and understanding of design. Owston and colleagues (2009) used game creation to encourage traditional literacy practice in schools. Albuquerque and Cruz (2013) investigated the use of game creation to develop digital literacy, meaning essentially familiarity with digital technology, in deprived schools. Allsop (2015) used “thinking maps” and group discussion to investigate the cognitive processes of children when they create games, suggesting that while creating games, children:

transform their mind into a lab where they can develop and test their designs, through thinking (dialogue with “self” and “others”) and an action (dialogue with design) before turning these into reality using software.(p. 14)

The *connections between games and schools* that I refer to in this thesis are essentially when the content of school reminds students of content from a game; or *vice versa*, i.e. an element from the game reminds the player from school content. Some references in the literature that explicitly describe connections between school and gaming refer to learning strategies, and not to content. For example, Hamlen (2011) employed surveys with children to compare the learning strategies they employ in games and in school. Her findings suggested that there are some similarities between how students learn in both contexts, (e.g. action game players tended to use more repetition to learn, while adventure game players employed more imagination based strategies).

In a similar approach, Gee (2007) identifies “good” learning principles applied in games, suggesting that schools should employ them more. Blumberg and Altschuler (2011) approached students to ask about connections in focus groups, and found out that although students see clearly differences in the learning aspects of games and schools, they also see similarities in terms of learning strategies used such as trial and error. In their ethnography, Stevens, Satwicz and McCarthy (2008) also found that players sometimes have the

chance to practice learning models, (e.g. through apprenticeship), which are also useful in other contexts. In a different perspective, Kent and Facer (2004) employed surveys and interviews, suggesting that the boundaries between formal and informal use of technology are less distinct than previously supposed. However, with regard to content it is rare to find references in the literature. The cases described in the general knowledge learning in some cases can obviously be related to school topics, e.g. the historical reflections described by Squire (2011), which do not focus on those remembrance connections. One of the reasons why in Study 1 those connections were investigated was the contrast between the little presence of academic discussion and the clues from my own personal experiences (described in the Introduction of the thesis), which suggested that the topic could be an overlooked topic worth researching.

In conclusion, existing literature describes some alternative game related practices which have potential to influence the player. They are of particular interest because some of them, such as tangential learning, online interactions and game creations, arguably are choices that players can take, or not take. Therefore, assuming that players have the resources in order to engage in those practices, knowing about their benefits could offer to players' ideas of concrete choices that they can do if they want.

2.1.4 Conclusion about the influences of gaming

The review about the negative and positive influences of gaming has a clear role in this thesis, particularly to the research questions about the understandings of players regarding the influences of gaming (RQ1), and about how reflecting about the influences of gaming can be taught (RQ2). The review also outlines the academic discussions about it, which is necessary because in Studies 2 and 3 those discussions informed the research practice, being adapted to be learnt by students. Therefore it was necessary to describe the literature that was used as a foundation to design the Reflective Gaming Course.

Additionally, the thesis suggests a perspective on the influences of gaming. In the sections above I outlined how the perspectives of players tend to be excluded from the discussion about the influences of gaming. It will become even clearer after the review on the game education proposals. In order to integrate the influences of gaming into a game education proposal, the influences of gaming I reviewed here had to be seen from the perspective of the game educationist; which is the adaptation of the knowledge from an academic context to the personal scope of players. Studies on the influences of gaming could incorporate this concern with players by addressing the question: “how can my findings support players in their decisions about their gaming practices?”, which could facilitate the use of that knowledge by players, either directly or with the help of journalists, educationists, parents or others. It might be related to an assumption that the influences of gaming are deterministic, in the sense that the players have little or no power to alter the influences of their gaming practice. In Section 2.3 I describe the few game education initiatives that suggest that positive outcomes might result from informing players about the influences of gaming. However, the literature describing the influences of gaming rarely considers that games could use that knowledge to improve their practices.

It could be argued that the literature on the influences of gaming – or part of it – is still too recent and crowded with uncertainties to be used as a firm foundation to design a course as I proposed. I would argue, however, that although similar projects in the future might be better informed by future research – including ones similar to this one – the current body of knowledge is already shaping the discussions to the point that it allows reasonably informed discussions in the classroom.

2.2 Educational foundation

Education is not a neutral process: as a social construct, it is embedded in ideologies, epistemologies, ontologies, and politics (Kincheloe, 2008). Historically, the nature of what education is or should be was discussed by scholars, and educational practice is guided – explicitly or implicitly – by those theoretical frameworks. In order to answer the research question about how

reflective gaming can be taught (RQ2), an educational intervention was designed (RGC) and therefore it seemed necessary to present its educational philosophical foundations. In other words, this is a description regarding to which scholarly calls regarding what education should be this thesis is responding.

In terms of philosophy of education, John Dewey (1902/2011; 1938/1997), Paulo Freire (1970/2012; Freire and Guimarães, 2011) and others (e.g. Kincheloe, 2008) offered valuable insights; despite the fact that they wrote in very different contexts. With regard to education in the specific scope of educating about the media, media educationists are a necessary reference and David Buckingham (e.g. Buckingham, 2003) the most pivotal amongst them. Some of the ideas from those contexts were relevant to point out directions that were followed throughout research; those are discussed below, with comments about how the ideas relate to gaming. It is important to mention that media education as a field will not be reviewed here; an outline of the field and its historical development can be found in Buckingham (*Ibid.*). Only the ideas of media education which are directly related to the proposal here described will be addressed in this thesis.

There are many rationales behind the media education project of education about the media; some apply to digital games more than others. One point is the recognition of digital games as a cultural practice worth studying, similarly to other forms of expression, such as the fine arts. It has a socio-political implication, as the fine arts are historically associated social class, whereas the media (and digital games) are widely consumed (Ladson-Billings, 1995). Another point is the neutrality of media: it has a specific language, ideological biases, and implicit intentions (Buckingham, 2003). It also influences students' identity, judgements, preferences and forms of pleasure (Burn and Durran, 2007; Freire and Guimarães, 2011). However, there is wide belief that media is or can be neutral, and its influences are often difficult to be perceived by users, in which case one of the aims of media education is to promote an active use of media rather than a mindless one (Potter, 2004); the importance of an active engagement with games in particular was also emphasised by Gee (2007).

Media educationists, however, aim to improve not also the media use, but also relevance of schooling for learners, by approximating learners' out-of-school experiences in the classroom. More than that, to recognise the forms of informal learning present in media usage, and create connections between the formal learning practices (Sefton-Green, 2004; Fantin, 2010). To connect the learner experiences to education was something that was also advocated by Dewey (1938/1997) and Freire (1970/2005). On the one hand, practitioners can depart from the learners' universe to design educational practice that is meaningful to them (Freire, 1970/2012), on the other hand the school content has to be "psychologized, turned over, translated into the immediate and individual experience within which it has its origin and significance" (Dewey, 1902/2011, 29). Both Dewey and Freire emphasised the value of knowledge that is enacted in the interaction between learner and world, relation that can be approximated to what was called *transactional* by Dewey and *dialogical* by Freire. To the latter, the dialogical objective-subjective knowledge is crucial to allow learners to bring the learning to their contexts, hence allowing them to act in the world. To Freire, knowing and acting should also be dialogical.

A concern that should be taken into account when designing such approximations is how to avoid a "colonization – a 'curricularization' – of domestic space and family relationships by the imperatives of school" (Buckingham and Scanlon, 2003, p. 9). Fantin (2010) expresses this concern as the risk of "not only making play scholastic but also making education trivial and banal" (p. 58). In the particular case of games, it is important to avoid jeopardising the legitimacy of unambitious, playful, gaming.

The protection of children's leisure spaces also highlights the aspect of education about being morally responsible rather than merely technical (Dewey, 1938/1997). There are two different dimensions associated to that when it comes to gaming; the first one being the judgements made about it. With this regard, Potter (2004) defends that the value of media education should be the criticality, which offers an alternative to technophobic or technophile perspectives. Buckingham (2007) expressed a stance that

summarises the points above: bringing children's universe to the school whilst developing an approach that embraces the complexity of gaming:

I continue to maintain that we need to bridge the 'new digital divide' between schools and children's out-of-school cultures – and for many children, that includes the culture of computer games. In doing so, however, we will need to move well beyond a one-dimensional, defensive approach. Rather than mere celebration, we need to develop a much more rigorous and critical – but also more creative – engagement with children's out-of-school cultures. (p. 118)

Another aspect of an education that is morally responsible is about social change, which is emphasised by Freire (1970/2005). When it comes to gaming, there are some topics that can be associated with this, in particular problems of sexism and racism in gaming culture; which critical voices such as Kincheloe (2008) and hooks (1994) insist that should enter the classroom, dismissing the fallacy that such problems will naturally end if we just pretend they are not there. Some advocates of critical media education also highlight the importance of learners to be able to see through those sorts of biases in the media representations (Kellner and Share, 2005).

This thesis does not claim to be a Freirean study, nor a Deweyan. However, it does make reference to the above conceptions from these authors and others, as background inspiration that guided the research to a limited extent. Therefore, this research investigates a theory and practice of game education, but within the wider context of media education, and inspired by other education theorists.

2.3 Game education and game literacy

Games and education are related in a variety of ways. Felini (2012a) describes five different – and to some extent, separated – fields: (i) pedagogical use of games, (ii) socio-cultural practices of youth, (iii) censorship (e.g. age ratings), (iv) influence in the development of youth, and (v) video game education. The latter is situated within a media education context, i.e. to educate *about* the

media, not necessarily through media (Buckingham, 2003). Media education has been developed in a variety of ways since the beginning of the last century, and its presence in schools is normally justified by the potential to encourage citizens to relate to media in an improved manner, which in this context is called media literacy. Buckingham (*ibid.*) describes media literacy as containing three attributes, the three “C”s.

- Cultural: understanding media as cultural objects, situated within a multitude of other cultural expressions. This helps to bridge the gap between the fine arts and the popular arts, by legitimating popular arts as academic topics.
- Critical: understanding media with regard to the language it uses its affordances, as well as the political underpinnings of media, in order to understand its deeper meanings.
- Creative: being able to design and produce media, therefore actively participating in a society that has an increasing presence of independent productions, and gaining insight about how media are created and the bias involved.

In the case of games, there are specific aspects that should be taken into account when extending the concepts of media education and literacy to digital games. For example, digital games do not explicitly aim to convey information, as most other media (e.g. television). Also, one argument to justify media literacy teaching – or other new literacies such as digital literacy – is that they are considered competitive competencies in terms of learning and working, and teaching these competencies to all students would be a way to fight unequal opportunities (Lankshear and Knobel, 2006), which arguably would not apply to games because *knowing how to use games* is not normally considered a valuable professional skill, as knowing how to use the internet for instance. Moreover, digital games are currently probably the most important medium that intentionally poses a designed challenge for the consumer, who need to overcome the challenge in order to consume it. Hence it is natural that game literacy scholars would have to dedicate some thought in order to adapt

the concept to games, which generate a variety of contexts, concepts and pedagogical strategies.

2.3.1 The contexts of game education

In this section I will outline the contexts – including the venues (e.g. home, school) and agents (e.g. teachers, the games themselves) involved – in which game education can occur, according to the literature.

Game education when understood as education about the games or the process of acquisition of game literacy has been discussed and empirically investigated in a variety of contexts. One way to understand game literacy is as the ability to play games and be familiar with the whole game culture, in which case the context to develop game literacy is essentially, through practice, through playing games (Williamson and Facer, 2004; Squire, 2008; Whitton, 2014).

However, most perspectives of game literacy are related to formal education, or at least to a process of intentional education. Some of the perspectives that reflect about game education in the contexts of schools in general are the ones in Apperley and Beavis (2014), Klimmt (2009), and Felini (2012a). Some authors work with a specific context within formal education, when students are allocated to a game education course, such as: at-risk schools, in order to improve engagement of students (Peppler, Warschauer, and Diazgranados, 2010), secondary school media education (Buckingham and Burn, 2007; Burn and Durran, 2007), Media studies in A levels (Newman and Oram, 2006), or high education, aiming to prepare professionals who will work with games (Zagal, 2010). Fromme (2012) suggests that game education should merge with traditional curricular subjects, and describe some subjects as more easily related (English, foreign languages, social or ethics related subjects, art, music) and subjects that demand creative solutions to include game education (such as science and mathematics). Similarly, Partington (2010) worked within the context of English teaching. In the case of Birmingham and colleagues (2013), the development of game literacy occurred in the context of the project Making Games in Collaboration for Learning (MAGICAL), which involved different teams in a variety of European countries, working with the development of

strategic skills through game design in primary and lower secondary schools. There are also alternative contexts where students can learn, like in a course during a summer camp (Sanford and Madill, 2007).

Game education does not address only young people; it can also educate adults. Moumoutzis and colleagues (2014) conducted game education workshops with teachers, considering that game literacy is an important skill for teachers if they are expected to use games in the classroom. Ideally, the game education workshop would help teachers to see the world through the “point of view of gaming” (p. 257). Felini (2013) also wrote about the experiencing of educating teachers, however, he was preparing teachers to conduct game education courses themselves, rather than using educational games.

Parents were also addressed by studies; Aglieri and Tosone (2012) offered a course for parents in order to develop a more critical perspective about the stereotypes about gaming, for instance that gaming is necessarily an anti-social activity. Steinkuehler (2015) highlighted the relevance of parenting in supporting positive gaming practices, but criticised the increase of expectations about parenting, especially prescriptive, non-realistic expectations of parental support. To her, research about good parenting with regard to games has to depart from an understanding of the actual possibilities of parents, admitting it is not something that is simple. This echoes the opinions of parents from the focus groups of Kutner et al. (2008), who described that most parental influence is limited to restriction, and even this is often challenging for parents. Chuang and Tsai (2015) also demonstrated interest in the game literacy of parents, but they surveyed their current game literacy instead of promoting activities to teach it. In that case, game literacy for parents was interpreted as ways that they can intervene with the game practices of children.

There are other possibilities of education about games. Brooks et al. (2015) and Unsworth and Ward (2001) offered insight directed towards professionals who offer clinical interventions for players in cases in which their gaming practices is particularly problematic. The other possibility is the media playing the role of game educator. With this regard Zwieten (2011) comments about

the role of video game journalism of shape the discourse of game culture, which can be considered a way of educating about games. In her book, McGonigal (2012) offers an appendix with practical advice for gamers, in which she establishes a form of direct instruction between the scholar and the gamers amongst her audience. She describes simple suggestions (i.e. to play moderately, with offline friends, cooperatively, creatively, while feeling good, and without the need for violence) that are addressed to players.

In summary, most authors research game education in formal educational settings, but others took into account game education processes that address parents, teachers, or that occur in contexts such as psychotherapy clinics, game related media, or by simply playing and engaging with game culture. Obviously, the contexts of game education are closely linked to how game literacy is conceptualised, as it gets different connotations in different contexts. In this thesis, the investigation will occur in the scope of schools, but it could also be applied in other contexts. However, the way that game education is used in this thesis is as something that is designed, and not something that occurs naturally through game play; hence this approach to game education is closer to the approaches that work with game education interventions (e.g. Partington, 2010; Fromme, 2012).

2.3.2 Understandings of game literacy

The concept of game literacy is central to game education; it defines the context and the pedagogical practices employed. Although the term literacy is borrowed from written language, the literature about game literacy uses it in a variety of ways, to the point that sometimes it has little similarity to its origin.

As Buckingham and Burn (2007) describes:

Popular discussions of economic literacy, emotional literacy and even spiritual literacy seem to extend the application of the term to the point where any analogy to its original meaning (that is, in relation to written language) has been lost. Literacy comes to be used merely as a vague synonym for competence or skill. The term literacy clearly carries a degree of social status; and to

use it in connection with other, lower status, forms such as television or computer games is thus to make an implicit claim for the latter's validity as objects of study. (p. 324)

This review describes six dimensions that have previously been associated with game literacy in the literature. Some authors include more than one of these dimensions, whereas others focus on only one of them. These dimensions of game literacy are: (i) enabling entertainment, (ii) understanding games, (iii) playing critically, (iv) playing safely, (v) playing beneficially, and (vi) creating games. Each section below will cover one of these.

2.3.2.1 Enabling entertainment

The most basic understanding of game literacy is the capacity to use games to their main end, which is entertainment. Squire (2008) defined game literacy as the “*expertise* in designing rewarding experiences for oneself within a gameworld” (p. 643-644). Whitton (2014) uses it in an expanded way, including knowing the implicit norms and conventions, in-jokes, etc. Williamson and Facer (2004) reminds readers that game literacy is an experiential competency that extrapolates a simple perspective of *reading* the game because it involves visual and auditory processing, and using a set of complex resources of tools.

Other authors, although they emphasise other dimensions of game literacy, include the capacity of playing the game as the *sine qua non* for a game literate person (Sanford and Madill, 2007; Buckingham and Burn, 2007; Zagal, 2010; Zwieten, 2011). Buckingham and Burn (2007) highlight the risk of not allowing the concept of literacy to include an entertainment dimension. They wrote:

There seems to be little place in some conceptions of critical literacy for aspects of pleasure, sensuality and irrationality that are arguably central to most people’s experience of media and of culture more broadly. An emphasis on critical distance fits awkwardly with the emphasis on immersion and spontaneous flow – and even the pleasure of addiction – that is frequently seen as fundamental to the experience of gaming. As such, we

would wish to caution against a narrowly rationalistic conception of critical literacy (p. 329)

Even when the concept of game literacy is focused on knowing how to play, it can still have relevance to educational processes. Whitton (2014) warns about the possibility of students who lack in game literacy struggling to cope with pedagogical practices based on games in schools, particularly if the performance in the game is essential to the learning or assessment. This concern reverberates with Facer and Furlong (2001), who raised the issue of adults taking for granted that children and young people are familiar with digital technologies, which clearly is not the case for all of them. Contrastingly, Peppler, Warschauer, and Diazgranados (2010) seemed to consider that their students in an at-risk school were already game literate. They proposed activities of game analysis and critique, including written critique, thus tapping students' interest in games to motivate them to participate in school activities such as writing, thinking analytically, dealing with divergent views, evaluating evidence and high quality discussions. In that case, game literacy was not something to be taught, but something that students already had and that could be channelled to pedagogical practices. This reasoning also applies to Apperley and Walsh (2012), who proposed a Heuristic for Understanding Gaming (HUG) in order to support teachers' approximation between game related literacy practices (in paratexts in particular) with formal education literacies.

In this project, the question of whether knowing how to play and be immersed in game culture is part of game literacy is not central. Because the perspective developed here related to what can be taught to players, therefore the aspects of game literacy that players supposedly learn by themselves is not central.

2.3.2.2 Understanding games

Game literacy can be considered as the capacity to understand games at a non-trivial level, which Zagal (2010) contrasts to a naïve understanding of games. In the case of Zagal the concept becomes particularly academic, as he is researching within higher education. Amongst other claims, he described that

his students “stepped back from their traditional role of “gamers” or “fans” and engaged in reasoning critically and analytically about the games they were studying” (p. xi). He described the deeper understanding of games in four parameters: as a cultural expression, in comparison to other games, as a technological object, and as a set of components that generate experiences. However, there are many descriptions of the dimensions of deeper understandings of games, even in game education proposals aimed at school students. Being game literate, according to a range of authors, includes understanding several aspects of games, such as the:

- cultural (Felini, 2012a; Buckingham and Burn, 2007; Partington, 2010; Apperley and Beavis, 2014; Zagal, 2010),
- social (Buckingham and Burn, 2007; Moumoutzis and colleagues, 2014; Zwieten, 2011; Newman and Oram, 2006; Fromme, 2012; Apperley and Beavis, 2014),
- technological (Felini, 2012a; Zagal, 2010),
- commercial (Felini, 2012a; Buckingham and Burn, 2007; Zwieten, 2011; Newman and Oram, 2006; Fromme, 2012),
- ludic (Felini, 2012a; 2012b; Buckingham and Burn, 2007; Zwieten, 2011; Newman and Oram, 2006; Fromme, 2012; Apperley and Beavis, 2014),
- narrative (Felini, 2012a; 2012b; Buckingham and Burn, 2007; Moumoutzis and colleagues, 2014; Newman and Oram, 2006; Fromme, 2012),
- language (Felini, 2012a; 2012b; Buckingham and Burn, 2007; Moumoutzis and colleagues, 2014; Zwieten, 2011), and also the
- social discourse about games (Newman and Oram, 2006; Fromme, 2012; Apperley and Beavis, 2014; Aglieri and Tosone, 2012; Zwieten 2011).

Each of the above aspects can also be understood in different levels of depths, and some descriptions of those understandings can be very sophisticated and abstract. Arguably, if games are sophisticated cultural expressions, it is justifiable to study digital games for their own sake, as happens with literature,

arts, etc. However, if we begin to pose pragmatic questions like “*what is the use?*” for each of these topics, it would probably open a whole new discussion with a variety of points of view for each proposed aspect. However, as it will become clear later, one of the fundamental concerns of this thesis was to select knowledge that is *useful* for learners and society. It does not mean, however, that my judgements of usefulness are definitive, as they were debateable choices taken in the context of this thesis.

In spite of the inclusion of some *understandings* as part of the game concept literacy, some researchers have warned against overly abstract knowledge of games. Partington (2010) did not want to deliver knowledge about games from teacher to students, quite the opposite: he wanted to reveal the “untapped knowledge of culture and society’s perceptions towards it, which they [students] are not bringing to the course” (p. 82), to which games seemed to be a bridge. For that reason, he avoided canonical knowledge that does not refer directly to learners’ experiences, he wrote: “The history of games, whilst appearing to fit into the cultural function of game literacy, increasingly seemed to promote a canon of games, which I wanted to avoid” (p. 83). Buckingham and Burn echoed this concern, suggesting that

these concepts are by no means purely abstract: they need to be related back to students’ wider cultural knowledge both of games and of other relevant experiences which serve as examples and analogies. (p. 336)

Apperley and Beavis (2014), showed a similar concern, included in their set of knowledge an aspect described as ‘*me*’ as a game player, which includes

issues of value, ideology and identity, and how players are positioned by the game. (...) This focus centres exploration on students’ own involvement with digital games as players, creators, and ‘readers’, with the goal of critical reflection about practices of play. (p. 50)

This is clearly a different approach from Zagal (2010). Although Zagal proposed a very academic take on game education – in accordance with his

context in professional and academic high education instruction, in which he offered a game module – he demonstrated concern about the danger of game education processes jeopardising the fun feeling of learners. However, he interviewed his students after the course and found that some students reported having more fun with games after they began to engage with games with more complex understandings: thinking ahead more, paying more attention to details, and analysing broader aspects of the game. Contrastingly, no student reported having less fun because of the course.

This section has described some of the understandings about games that are often included in the concept of game literacy, which sometimes can become abstract and complex. Although there is a variety that includes abstract and personalised knowledge, rarely those understandings are explicitly subjected to a question about the aim of teaching it. In this thesis, the selection of knowledge to address in game education aimed to have concrete use for players, beyond game play.

2.3.2.3 Playing critically

To develop a critical approach to media is a common theme of media education, for example Buckingham (2003) considers it one of the three main characteristics of media literacy. However, the meaning of *critical* is not always the same. Critical pedagogues such as Freire (1970/2005) and Kincheloe (2008) propose an understanding of critical education as an education that – alongside with other aspects – prepares learners to contest established devices of power and oppression instead of taking them as granted and immutable. This approach to the concept of *critical* can be used in media education and media literacy, such as that described by Kellner and Share (2005),

we ought to also indicate how media culture can advance sexism, racism, ethnocentrism, homophobia, and other forms of prejudice, as well as misinformation, problematic ideologies, and questionable values, accordingly promoting a dialectical approach to the media. (p. 373)

It is important to problematize this meaning of *critical* because sometimes the word is used in a different sense. For instance, Moumoutzis and colleagues (2014) described a gaming literacy framework in three parts; (i) understanding and evaluating, (ii) critical consumption, and (iii) crafting. Although they do mention values and stereotypes in the section about understanding and evaluating, the critical consumption is described as:

Critical consumption through reflection on gamers' behaviour in order to better exploit free time, foster learning and enrich human relationships. Time spent for video game playing, game preferences, social aspects of game play, type of entertainment and learning offered are issues related to this critical self-reflection. (p. 259)

Similarly, Buckingham and Burn (2007) place a critical approach to media as one of their fundamental pillars, but also use the term differently. In their description of critical engagement with games observed in the classes they offered, the term critical seemed to refer to the capacity to critique games, essentially without political dimensions:

Various forms of critical engagement with games were demonstrated in the interviews. In some cases, these were forms of appreciation, and expressions of individual taste: there were children who particularly liked the Harry Potter games, or enjoyed skateboarding games because of the excitement and satisfaction they provided, or enjoyed social aspects of gaming (there were examples of children playing with friends, brothers and sisters, fathers and mothers, and even a grandfather in one case). In other cases, there were very specific kinds of critical comment: on the differences between PC-based and console-based games; on boring aspects of games which were too slow or repetitious; and in one case, a series of critical remarks specifically about the second Harry Potter game. In some respects, then, children and young people can be seen to develop quite sophisticated forms of critical discourse through their

everyday engagements with games which can be further explored in the classroom (p. 333-334)

One particular episode of the project described in Buckingham and Burn (2007) reinforced that the political aspects of gaming were not the focus of their work. Students were encouraged to think about the characters according to Vladimir Propp's taxonomy, which resulted in a narrative based on Jimmy DeMora, the *hero*, saving his kidnapped daughter, the *princess*. The authors seemed satisfied that the narrative followed the Proppian models. However, the fact that children reproduced the sexist pattern *male hero saves defenceless female* apparently was not problematized when this same pattern and its potential consequences were denounced by Dietz (1998) as the most typical role and unhelpful representation of women in games. It would be unfair, however, to suggest that the critical dimension of media education proposed by Buckingham (2003) is apolitical; it is quite the opposite. But Buckingham and Burn's (2007) adaptation of critical media education applied to digital games seemed to acquire a less politically or ideologically oriented approach.

Contrastingly, Sanford and Madill (2007) tackled sexism and other forms of oppression explicitly in their understanding of game literacy. They questioned:

Are video game players critiquing and challenging the often highly patriarchal, sexist, and racist worlds presented in video games, or are they absorbing a world-view that emphasises hegemonic, Eurocentric patriarchal values of competition, rationality, hierarchy based on power, and views that support racist and sexist notions of the world? (p. 286)

In a different publication, Madill and Sanford (2007) suggested that critical game literacy should be emphasised:

Scholars need to problematize the seamless qualities of video game play and creation and create spaces where players step back from the powerful, immersive qualities of game play and examine values that, implicitly or explicitly, support violence, war, inequity, racism, sexism, or suffering of the masses of the

earth's populations. We believe that adults - - teachers and parents - - have an obligation to learn more about video game play and development so that they can create spaces for critical examination of the games and of the players' own beliefs and values, potentially changing harmful aspects of video games while enhancing their powerful benefits and learning potential.

(p. 451)

Different authors mention some of these aspects with less emphasis; for example, Zwieten (2011) describes three aspects of game literacy: functional, critical and rhetorical. In the critical one, he describes understanding of dominant perspectives and ideologies such as sexist representation. Apperley and Beavis (2014) briefly mention being aware of stereotypes of gender and race whereas Klimmt (2009), Moumoutzis and colleagues (2014) and Felini (2012a) cite game values and stereotypes. Gender stereotypes also appear in Newman and Oram (2006), but their proposal approached gender differently. Instead of focusing on stereotypes and representation, they focus on the participation of women in games culture, problematizing the beliefs that games are boys' toys and the misogynistic characteristic of some gaming contexts.

In conclusion, it seems that a critical engagement with games is a common aim of game education. However, some proposals briefly mention it as a detail, or interpret critical gaming as something less politicised than critical theorists would conceive. In this thesis, the concept of critical engagement with games will include the awareness and contestation of patterns of sexism, racism and other forms of dominance, as well as fatalist and sensationalist discourses about the influences of gaming, aligned with the critical pedagogues. In this way, criticality can assume a meaning that contributes to the social responsibility of the project, which is coherent with authors from my theoretical foundation (e.g. Freire, 1970/2012; Kincheloe, 2008, hooks, 1994). In addition to this main use of the term critical in this thesis, sometimes the term is also employed to refer to an approach that contest simple conclusions. The most common example with this regard in this thesis refers to a *critical* understanding of the idea that "gaming develops intelligence", meaning that

simplistic assumptions are contested, problematized and seen from a complex perspective.

2.3.2.4 Playing safely

This section will address the inclusion of topics such as violence and excessive gaming in game education proposals. However, before so doing, it is necessary to discuss two different approaches to media education: protective and critical. In the history of media education, scholars and practitioners have often adopted a protective approach (see criticism to it in Buckingham (2003), and Gutiérrez and Tyner (2012)). In other words, they place their focus on protecting learners against the harmful effects of media use in the centre of the media education proposal. In the specific case of games, these potential negative influences also inspired some of the existing game education proposals.

It should be noted that the previous section (2.3.2.3) about critical gaming is, generally, also motivated by potential negative influences of games. This difference between *protective* and *critical* approaches may seem subtle, but they are crucial. Buckingham (2003) describes protective approaches as characterised by the aim to inoculate students against the harmful media, the perspective that students are passive victims, and an underpinning moral defensiveness. On the other hand, critical approaches tend to focus on the learner's capacity to make judgments and to contest dominant and oppressive discourses, taking into account the learners' potential to be active and transformative (Freire, 1970/2012) rather than taking the media as intrinsically problematic. This is why critical approaches are more likely to combine positive influences of media in the programme, as well as the negative. Again, the word critical might be used by either approaches, and this separation is not always clear-cut. To facilitate the division of topics, this section will focus on the topics of *violence* and *excessive gaming*, which are more frequently associated with protective approaches, even though whether an approach is critical or protective sometimes might be puzzling.

Some of the most quintessential protective game education proposals are the ones found in Klimmt (2009) and Chuang and Tsai (2015). Klimmt's game education proposal describes game literacy in three main parts: (i) resilience against (automatic) game effects (such as aggression and stereotypes), (ii) coping with social affordances to play again or for longer (i.e. social pressure for excessive gaming), and (iii) managing inertia effects of resources invested in playing (again against excessive gaming, situations that the players is "trapped" because they have already invested time, energy, money, etc.). His approach sometimes is very prescriptive, and aims to define a *normative model* of a competent player; closer to what Buckingham (2003) describes as an inoculation designed to protect students. Echoing this perspective, Chuang and Tsai (2015) surveyed the game literacy of parents and children, focusing on practices that protect children. The topics surveyed include awareness of age ratings, parental control, presence of violence and sex, dangers to health, excessive gaming, pirate games, and respectful behaviour. The questions of their survey are suggestive of how much protective approaches can be overly simplistic about the engagement with games, and distant from players' perspectives. For instance the items "I understand that there are differences between the content of digital games and the real world" and "I understand correct concepts of playing digital games" (p. 110) seem to be problematic; the former for assuming that players are aware of the way that fictional realities interact with their worldviews, and the latter because it is too vague to suggest the extent to which players are game literate.

Some proposals are less protective. Unsworth and Ward (2001) suggest that children should be educated to be critically aware of violence in games, even though they do not specify details of what this means. McGonigal (2012), in her advice for gamers, is fairly prescriptive, (e.g. "Don't play more than twenty-one hours a week" (p. 365)), but she also addresses positive influences of media and she clearly is an advocate of the benefits of gaming, not the opposite. Moumoutzis and colleagues (2014) include time spent playing games as one aspect to be discussed in their game education proposal.

Another approach to the negative influences of aggression and excessive gaming is to discuss the media/social discourses about them given the fairly constant media response that exaggerates or distorts findings about the negative influences of gaming. Aglieri and Tosone (2012) offered a workshop for parents to discuss stereotypes about gaming in order to fight their misconceptions (e.g. gaming is alienating), in which case the stereotypes about games are generated in a brainstorming session with the parents, and then the ideas generated are discussed. Apperley and Beavis (2014), Fromme (2012) and Newman and Oram (2006) included violence and/or addiction in their game education programmes, discussing the research in the area and the distortions of discourses that address it.

It can be seen that violence and excessive gaming can be addressed in a variety of ways; there are proposals that are more normative, proposals that allow for more dialogue and reflection, and proposals that focus on the discourses created about these topics. As it will be seen in the description of the game education model, this project aimed to a less normative and more dialogic and critical approach to gaming; therefore it is more similar to projects that aim to develop critical awareness and critical discourses about games.

2.3.2.5 Playing beneficially

The potential positive influences of gaming (section 2.1.2) are often ignored, even by advocates of the value of games, who would sometimes focus on the game characteristics instead of addressing influences that extrapolate from playing. In some cases this is briefly mentioned, but the topic is not explored much further. Apperley and Beavis (2014) described the game education role of “developing players’ increased awareness of meta-cognitive strategies and processes” (p. 51). Fromme (2012) mentions it in one of the guiding questions for the content of game education, in which he includes formal and informal learning: *“How and what can one learn from playing computer games? In-game learning, tutorials, serious games, hidden curricula, and promoting informal competencies”* (p. 653). Madill and Sanford (2007) also mention the potential of game education to enhance the benefits of play and the learning potential, but this is not the emphasis of their approach. Moumoutzis and

colleagues (2014) also mention the importance of game literacy to allow players to reinvent their identities, probably referring to Gee's (2007) concept of identity play in games:

Gaming literacy is not an ends in itself. It is rather a means to enable deep reflection on what it means to live in the digital age and empower individuals and local communities to undertake creative projects to reinvent their identities. (Moumoutzis et al., 2014, p. 261)

In addition to those brief mentions, Felini (2012a) gives a more complex description of what he understands as the role of game literacy with regard to the cognitive engagement with games:

Supposing that, during or in parallel to the ludic experience and without removing the enjoyment that it encompasses, the player knows how to perform mind operations that are more complex, related to a systemic comprehension of the software logic and achievement of a deep form of self-awareness of the decisions and actions carried out. This high level of competence related to play is neither innate nor automatically acquired. (p. 16, translated by the author)

In Felini (2012b) he presents an analytic table that players can use to analyse games, and amongst several other aspects more related to the gaming *per se*, one question addresses the skills employed in the game, offering the following boxes to be filled by the learner: strategy, reflexes, patience, precision, memory, observation, concentration, others. As it can be noted, in neither Felini (2012a) nor Felini (2012b) does he explicitly talk about the influences these cognitive engagements have on players when they are not playing, this transfer aspect remains implicit but present, I would argue.

However, one of the proposals that address the influences of gaming most explicitly is the proposal of Aglieri and Tosone (2012) and their workshop for parents. An unusual characteristic of their proposal is that they propose to find a middle ground, treating claims of both positive and negative influences of

gaming as stereotypes to be problematized. They describe their approach as follows:

There are two kinds of mistake we can make when we interact with media: to be afraid when there is no danger (in fact, when it would be good to experiment and play) and not having enough fear (the one that helps to be attentive to how we move, not the one that paralyses) when, conversely, there are dangers.
(p. 34, translated by the author)

It is noticeable how game literacy accounts aimed at parents tends to be the one that deals with the influences more directly, perhaps because scholars consider, implicitly or explicitly, that the influences of gaming are a concern more for parents than for the players themselves. This aspect can also be noted in Steinkuehler's (2015) discussion about parenting and games. Although the influences of gaming is mentioned by some scholars as learnable by players, there is more emphasis in other aspects of game literacy – as I described in the section 2.3.2.2 – just like if decisions regarding more positive or negative play should only be taken paternalistically by parents or organisations that define age ratings, but not by players. Contrastingly, most of the literature seems to suggest that players should, instead, develop even more their capacity to elaborate sophisticated comprehensions of the gaming activity itself.

2.3.2.6 Creating games

The fact that game literacy makes reference to traditional literacy, i.e. dealing with written texts, supports an understanding of game literacy that includes *reading games* and *writing games*, just like traditional literacy includes both reading and writing. In other words, when the concept of literacy is transferred from the written text to games, it is transformed in the capacity to express creatively using games, i.e. game creation or variations of it, which arguably also allows students to understand (or read) games more deeply. The *creative* engagement with games is one of the three “C’s described by Buckingham to describe media literacy, and in the case of games it is widely used as well (Felini, 2012a; Moumoutzis et al., 2014; Bermingham et al., 2013;

Buckingham and Burn, 2007; Burn and Durran, 2007; Sanford and Madill, 2007).

I would like to differentiate, however, between the creative aspect of game literacy – which suggests that game creation is worth teaching and learning – and using game creation as a teaching activity, which can aim to develop game creation skills *per se*, but can either be used to promote an associated skill, such as systemic thinking (Zimmerman, 2007) or digital literacy (Albuquerque and Cruz, 2013). In the former case, i.e. creative game literacy, the necessity of the inclusion of game creation was imported from traditional literacy and media literacy, but a reflection on whether the rationale for writing and creating media should apply equally to digital games is seldom made. Considering the fact that game creation is a sophisticated activity that uses a set of specialised skills, hence demands significant time and resources to teach, game literacy scholars would do better in making explicit the rationales that justify game creation regarding its cost-benefit relation, despite its conceptual coherence with the original concept of literacy. Rather than trying to delve in this discussion, which is a deep discussion that touches on more aspects that I covered in this thesis, I consider that for the scope of this research project the *creative* aspect of literacy when it comes to digital games is a reasonable but non-essential component of game literacy, which is coherent with the fact that many authors do not address it in their uses of game literacy (Apperley and Beavis, 2014; Unsworth and Ward, 2001; Fromme, 2012; Chuang and Tsai, 2015; Newman and Oram, 2006; Klimmt, 2009; Whitton, 2014).

As it is clear from the literature, game literacy has many aspects, and this thesis incorporated a variety of aspects in a game education model. The model as a whole will be described in Chapter 5, but the foundations were outlined.

2.3.3 The learning activities of game education

In addition to the concept of game literacy – i.e. what means to be game literate – there are also descriptions of learning activities employed to support students in their development of game literacy. Many authors (e.g. Unsworth and Ward, 2001; Apperley and Beavis, 2014; Fromme, 2012; Chuang and

Tsai, 2015; Klimmt, 2009) focus on the concept of game literacy, not really describing much of the practicalities of how to address it in the classroom.

According to the creative aspect of game literacy, some authors operationalised their game education proposals using game creation activities (Kafai and Peppler, 2012; Bermingham and colleagues, 2013; Buckingham and Burn, 2007; Burn and Durran, 2007; Sanford and Madill, 2007; Moumoutzis and colleagues, 2014; Albuquerque and Cruz, 2013; Felini, 2013). However, the extent to which creating games encourages students to develop a critical account of games is debateable. As described before (section 2.3.2.3), the critical accounts resulting from the experience described by Buckingham and Burn (2007) do not correspond to a critical account as it is understood in this thesis, namely, to be able to see how games reproduce patterns of power relation. Sanford and Madill (2007) made a similar reflection based on their own experience offering game creation workshops. They had defined game literacy in three aspects, operational, cultural and critical, to what they said:

...we can identify a proliferation of operational and cultural literacy learning, but saw much more limited use of critical literacy learning. Although the participants developed a more refined sense of operational literacies and adopted cultural literacies in their many interactions, their critical engagement was limited to aspects of the technological/textual and very few examples of sociocultural critical literacy were found (p. 292)

Kafai and Peppler (2012) made a similar comment, suggesting that creating games can develop game fluency, which they conceptualised as competencies in three spheres: creative, critical and technical. However, in the case presented, they suggested that the development of a critical fluency is a more unlikely outcome of game creation unless it is systematically supported. It seems that although game creation can be a valuable pedagogical activity for several reasons, it should be supported by other activities aiming specifically at critical understandings if a more critical perspective is to be encouraged.

Another aspect that has been highlighted is the process of designing educational interventions is the investigation of learners' perspectives in order to connect it to the pedagogical activities. Zagal (2010), for instance, made a preliminary study based on interviews to map the naïve understanding of games, in other words, the understandings of games before a process of game education. Apperley and Beavis (2014) expressed a similar opinion, describing it as follows:

Understanding the literacy practices involved in playing digital games and reconceptualising curricula to support the learning affordances offered by digital games have great potential to build strong bridges between students' out-of-school life-worlds and twenty-first-century curricula. (...) [games] cannot be understood simply on textual terms – successfully capitalising on digital games in the classroom requires an understanding of students' out-of-school gaming practices on their own terms" (p. 47)

There are few detailed descriptions of pedagogical activities besides game creation. Partington (2010) described the "Games and Me" poster, in which students drew posters about the relevance of gaming in their lives, including the social roles it plays. It aimed to bring the students' cultural background to be discussed in the classroom. Aglieri and Tosone (2012) in their workshop for parents led brainstorming sessions with them in order to fill a table with positive and negative pre-conceptions of games that the parents had, which was used to discuss the potential positive and negative influences of gaming with a more critical perspective. Peppler, Warschauer and Diazgranados (2010) did not aim to develop game literacy, but to tap students' prior game literacy to motivate them into school activities, but they had sessions of game play and game analysis, which was also described by Felini (2012b) and Newman and Oram (2006). The work of Newman and Oram was aimed at practitioners, hence it offers plenty of details about how to implement game education. They describe initial sessions about games in general, followed by study cases, each of which focuses on a topic such as violence or gender. As their proposal is to

offer game education in A-levels, the course seems to have a more academic status than courses for younger children. Zagal (2010) also had an academic approach as he was teaching in higher education. He described two main activities. The first was game journals, in which students would report their gaming experiences and reflections based on the sessions' topics. It evolved later to blogging, to allow students to share their experiences and reflections, as well as read the ones from peers. The second project was called Game Ontology Project, which had a wiki structure. He wanted students to be able to collaboratively build a body of knowledge about game concepts, imbued with a critical sense that would allow them to criticise and improve others' articles in the wiki. The Game Ontology website can be accessed in the website <http://www.gameontology.com/>.

2.4 Conclusion about the literature review

This chapter began by outlining the literature on the negative and positive influences of gaming, as well as other gaming related practices that are claimed to have influences. When investigating the understandings of players (RQ1) in Study 1, the research reviewed in this chapter aided the formulation of the interview questions. Although some of the questions made to participants were relatively vague, others addressed specific topics because those were considered relevant according to this review. For instance, during the interview participants were asked directly about tangential learning and excessive gaming.

The literature on the influences of gaming also echoes the approach taken later, when the RGC was designed and implemented in Study 2 and 3. In the case of the negative influences, it was manifested by adopting a balanced approach to topics that are often polarised (such as violence and excessive gaming), and by emphasising the problematic aspects on topics that are often underestimated by players (such as race and gender representation). In the case of the positive influences, the general approach was to problematize topics that can easily be interpreted uncritically, for example when research on cognitive gains of gaming is translated as a belief that “gaming makes players smarter”. The literature review describes some of the details that later were used to discuss

the topics with more complexity with students. In other cases, such as design practices and tangential learning, the approaches inspired by the literature review was less to problematize them and more to promote spaces to share experiences and inspire those practices considered positive.

The second part of the literature review addressed the theoretical foundations. Those inspired the development of the ICEED model and the RGC, in Chapter 5. Furthermore, some of the main inspirations drawn from this section were: to understand relevant knowledge as deeply connected to learners' practices, and to understand players as agents of their own learning and gaming practices. Moreover, the theoretical foundations highlighted the importance of addressing topics related to race and gender.

Finally, the third section described previous approaches to game education. Those approaches were essential to the design of the ICEED model and RGC in Chapter 5, and they were also crucial to explain the contribution of this thesis to the research field. It was through recognising the similarities and differences to previous approaches that the proposal stands amongst others. This is further explained in the final discussion (Chapter 8).

3. METHODOLOGY

This chapter is divided in three sections: in the first part it elaborates on the epistemological stance, describing a pragmatic understanding of knowledge and educational enquiry. The second part describes the practical-methodological strategies. It explains the nature of the overarching methodological approach, Design Based Research (DBR), making explicit how the three studies of the thesis fit into a Design Based Research proposal, clarifying the theories that the DBR aims to inform, and describing methods that are common to all studies. Finally, in the end, two aspects of ethical considerations will be discussed: the ethical procedures that were undertaken and the risks and concerns that were taken into account.

It should be noted that when discussing the methodological approach only the overarching strategy and the recurring features throughout the thesis will be outlined in this chapter. The specific methods (e.g. the questions of the surveys) will be clarified immediately before the respective study in each chapter.

3.1 Epistemology

A pragmatic approach to educational research guides this thesis. This perspective links educational action and enquiry, which to some extent describes the triple role I undertook: course designer, tutor, and social scientist. The object of my investigation, therefore, was mainly the concrete actions in schools, and these actions determined the quality of knowledge that resulted from this process. As Biesta and Burbules (2003) described, “educational knowledge, the “product” of educational enquiry, reveals *possible* connections between actions and consequences” (p. 110). By this description it should be clear that this thesis has no intention to describe complete solutions for the theoretical problems that are posed, but to generate knowledge with the potential to equip practitioners and researchers to follow similar steps. The following quote describes the knowledge that is expected from such inquiries:

...we shouldn't expect firm solutions from educational enquiry, but that we can only hope for "instruments" that can help us in the never-ending process of dealing with educational problems. In a sense it also means that the idea of "improving" educational practice in any direct way should be abandoned – at least, that is, so long as we think of improvement in which education becomes increasingly more perfect. Educational problems are always unique and for that reason always require unique responses, tailored as best as possible to the idiosyncrasies of the actual, unique situation. This, and nothing else, is what we should expect from educational enquiry. (Ibid, p. 81)

It is noteworthy that by adopting a pragmatic approach I am not *only* making a statement about the knowledge generated by the thesis. The pragmatic perspective also offers a new light into the research fields with which the thesis establishes dialogue, i.e. the influences of gaming and game education. To the former, the thesis offers a new epistemological understanding of the influences of gaming by asking for practical implications of such knowledge to the educational field. In other words, knowledge of the influences of gaming was, throughout this thesis, "psychologized; turned over, translated into the immediate and individual experience within which it has its origin and significance" (Dewey, 1902/2011, p. 29). Therefore, the thesis offers a practical and educational perspective on the influences of gaming. Similarly, the field of game education is also seen through a pragmatic prism: not only because the enquiry is embedded in practice, but also because a pragmatic approach leads to teleological questions about the end of educational processes. Biesta and Burbules (2003) describe it as:

In some ways, the most important conclusion that follows from a pragmatic understanding of educational research is that educational research is not only about finding better, more sophisticated, more efficient, or effective means for achieving educational ends that are taken for granted, but that inquiry into these very aims, ends, and purposes of education should be an

integral part of educational research. The “research agenda” for educational research should, in other words, contain both instrumental and value perspectives. (p. 109)

Therefore, it can be said that in this thesis I raise questions about the means and the aims of game education. In conclusion, in addition to the pragmatic approach to the knowledge and enquiry of the thesis, the pragmatic-educational perspective also informs relevant fields of research; on the one hand making these fields useful to the thesis and on the other hand offering to the respective research fields a different point of view on the knowledge they are producing.

3.2 Methodology

This section opens with a generic description of DBR that also addresses its epistemological coherence within the thesis. It develops into a description of how this thesis in particular (with its three studies) fits in a DBR approach, and its contribution to theory and practice. Finally, the section cover features about the methods that apply to essentially all studies of this thesis.

3.2.1 Design Based Research (DBR)

The thesis employed a Design Based Research (DBR) approach to the methodology. This methodological approach was initially named design experiments, proposed by Brown (1992) and Collins (1992) who described the need to develop methodological solutions in order to research learning interventions in naturalistic contexts, as opposed to laboratory settings. In the 21st Century many DBR papers were published, initially focusing on shaping the theoretical basis, and later focusing on employing DBR as a research methodology (Anderson and Shattuck, 2012). It should be noted that in this thesis I will use the term Design Based Research to refer to “*a family* of related research approaches with internal variations in aims of characteristics” (Akker et al., 2006, p. 4), which includes design studies, design experiments and others. These terms are sometimes used interchangeably (Collins, Joseph and Bielaczyc, 2004). In the next paragraphs the main characteristics of this approach are outlined.

DBR aims to fill a methodological gap between experimental studies conducted in artificial contexts and ethnographical studies, in a combination that Dede (2004) called interventionist ethnography. Similarly to experimental studies, DBR is interventionist, in the sense that it aims to study a designed activity or technology, which Kelly (2006) names as designed artefact. This characteristic of proposing and investigating a new intervention makes DBR “test-beds for innovation” (Cobb et al., 2003, p.10). In this point it differs from ethnographic traditions, which as a general rule tends to place the researcher as an observer or, sometimes, as a participant observer, in which case the researcher would normally try to become, to some extent, a member of the researched context, but would avoid interfering in the researched context. However, similar to ethnographic studies, DBR would employ a set of qualitative methods (i.e. interviews, observations) in order to generate a rich account of the design in practice, contrasting to the experimental tradition that in general would focus on testing hypothesis based on a few measurable variables (Barab and Squire, 2004). It is not to say that DBR does not apply quantitative techniques: it is frequently associated with the employment of mixed methods (Anderson and Shattuck, 2012). However, the variety of methods employed work in the context of discovery – rather than verification – and is characterized by an exploratory endeavour. It can be said, then, that DBR normally would be little concerned with replicability and generalizations. DBR can be foundational to posterior scaling studies, randomized field trials and other methodological approaches in a complementary manner (Kelly, 2006).

DBR projects are developed incrementally. In other words, the strategy to develop the practice is to use the lessons learnt in each iteration of the course to improve the designed artefact, consequently employing a series of iterations. These iterations are named differently within the DBR community, which sometimes uses the terms year, site, phase, cycle, case study (*Ibid.*). In this thesis I will use the term iteration. Each iteration is informed by the previous one; therefore, the whole DBR project must be flexible in the sense that it changes according to the findings throughout the whole project, instead of departing from an initial plan that has all details defined (Collins et al., 2004).

One of the unique traits of DBR is the combination of research aims that it proposes. In the one hand, it is very practical and it focuses in the development of a designed artefact, and provides useful insight to similar practices. This is not done by making claims of best practice, but by generating design principles or heuristics that guide the design of future similar interventions (Anderson and Shattuck, 2012). In addition to design heuristics, McKenney, Nieveen and Akker (2006) consider that there is a secondary output of DBR, which are the curricular products, e.g. materials used in the classroom. Those are developed to fit the learning specificities of the study, and if combined with the design heuristics, can be adapted to new contexts or inspire the development of new curricular products. On the other hand, DBR projects also aim to transcend the practical specificities and contribute to theoretical understandings (Barab and Squire, 2004; Collins et al., 2004). Thus it proposes a synergic relation between theory and practice: a practice is designed based on theory, and its empirical investigation informs the theory that originated it. Regarding this contribution to theory, Cobb and colleagues (2003) suggest that DBR focuses on an intermediate scope of theory, situated between a “narrow account of a specific system (e.g., a particular school district, a particular classroom) and a broad account that does not orient design to particular contingencies” (p. 11).

Some researchers describe DBR as a “Swiss Army Knife”, capable of being adapted to a wide range of contexts, and specialised in none (Dede, 2004). So the literature offers a variety of potential features of DBR, while a specific DBR project hardly will match all those characteristics, i.e. some projects will not use all functions of the Swiss Army Knife. Collins and colleagues (2004) illustrate it:

Our approach to design research requires much more effort than any one human can carry out. We put forward these ideas not because we expect each and every design experiment to embody them, but to give an overview of all things the design-research community is responsible for. In our ideal world, design research will move in the direction of embodying many of the practices we outline here. But it will take teams of researchers

and accessible archives documenting design experiments, as we discuss in the last section, to make these dreams at all possible.
(p. 33)

Therefore, although the project matches the description of DBR above, some characteristics frequently associated with DBR will not be encompassed in the present project. Some of the concerns present in the literature that will not characterize the present project are:

- (i) the inclusion of practitioners as co-investigators (Anderson and Shattuck, 2012). It is true that during the individual interviews of Studies 2 and 3 I created opportunities for students to express opinions about how the course should be, and how they perceived the premise of educating students about the influences of gaming. Although those initiatives point towards students as co-investigators, the term implies a deeper involvement of students. With regard to practitioners, unfortunately no one was available to participate much actively in the project; hence their limited role was not enough to judge them co-investigators;
- (ii) the separation between the researcher and the intervention designer (Collins, 1992). It would probably be positive to the research project to have a research team in which different professionals could specialise in different roles. However, as this was doctoral research, I had to play all the roles needed;
- (iii) the employment of multidisciplinary research teams (Collins et al., 2004). The same comment on the previous item applies to this one.

A pragmatic epistemological approach to research fits the use of DBR due to the emphasis on the practical outcomes, the importance of ecological validity, and its flexible usage of methods according to the research goals. Many DBR authors mention a pragmatic view of research as the most compatible with DBR, such as Cobb et al. (2003), Anderson and Shattuck (2012), and Barab and Squire (2004).

3.2.2 Thesis as DBR

In a DBR project, the designed artefact is a pivotal element, and the process began with its design. To be coherent with the pragmatic philosophical underpinning and with the DBR proposal, the designed artefact has to depart from the theory in order to, in the end, contribute back to theory. The theoretical foundations are exposed in the literature review (Chapter 2), in particular the alternative proposals of what game education is or could be. In the same chapter the reader can find a review of the claims about the positive and negative influences of playing games. They also play a central role in the design of the artefact because the inclusion of the influences of gaming is essentially the main characteristic of the proposal.

Amongst the studies about the influences of gaming, it is not very often that the voices and opinions of players are heard. Frequently they are treated as subjects who only suffer the influences of playing games, who do not necessarily have opinions or knowledge about the relevance of the influences. Study 1 (Chapter 4) aims to fill this gap by interviewing gamers about the influences of gaming. This study was based on 15 in depth, individual, semi-structured interviews with frequent players. It partially answered the research question about the understandings of players (RQ1), and contributed to the design of the artefact. The artefact here is understood as the Reflective Gaming Course, which was designed to answer the research questions about how reflective gaming can be taught (RQ2), about how the RGC is experienced by players (RQ3) and the outcomes of the course (RQ4). The necessity of listening to gamers' perspectives on the topics that would be addressed in the course was inspired by the educational perspectives that guide this thesis. It is part of the understanding that in the curriculum design, the subject matter should be translated to the learners' experiences (Dewey, 1902/2011). Freire (1970/2005) also describes a curriculum design that departs from students' experiences, is reinvented by educators and returns to them:

For the dialogical, problem-posing teacher-student, the program content of education is neither a gift nor an imposition— bits of information to be deposited in the students—but rather the organized, systematized, and developed "re-presentation" to

individuals of the things about which they want to know more.
(p.93)

Based on the two sources – literature (Chapter 2) and gamers' perspectives (Chapter 4) – the proposal of the designed artefact was built. It was initially conceptualised in a theoretical level as a proposal of game education, and then operationalized as a concrete plan, i.e. the designed artefact. The theoretical proposal and the designed artefact are presented in Chapter 5, which address the research question regarding how reflective gaming can be taught (RQ2).

The next step was to address the research questions regarding how the RGC is experienced by learners (RQ3) and the outcomes of the RGC (RQ4), through the first implementation of the RGC, which is considered Study 2 (Chapter 6). That study involved eight students who attended to the designed artefact (i.e. the Reflective Gaming Course) for five sessions in their school, in addition to attending to individual interviews after the course and filling online forms. The course was led by me. Many lessons were learnt from the experience, and the designed artefact was refined.

The iteration of the RGC, or Study 3 (Chapter 7), addressed the same research questions as the Study 2 (Chapter 6), and answered them more satisfactorily. The study occurred in a different school, involved 14 slightly older students who attended to the improved version of the Reflective Gaming Course, then condensed in four sessions only. The participants also filled online forms and were individually interviewed twice – before and after the course. This study also had an external observer in addition to my own observations. Although the course could be iterated more times, it was decided that the execution of the second iteration was satisfactory for the scope of this thesis; hence this was the last iteration of the course so far.

If in the Chapter 5 the theoretical proposal is presented according to the initial ideas, in Chapter 8 the proposal is presented again, with all the lessons learnt throughout the two iterations. This is the chapter where the designed artefact is presented in its refined version and accompanied by the design heuristics. In other words, it presents the outcomes of the DBR process.

Finally, in Chapter 9 I make the final remarks of the thesis, summarising the contributions, pondering upon the limitations, and making recommendations for future research.

The epistemological stance and the methodological strategy inform the type of knowledge that this thesis offers to the academic community of its fields. According to the DBR proposal to address both theoretical and practical matters, the contributions are as follows:

- (i) Practically, the thesis offers the Reflective Gaming Course as a curricular product, with enough detail to be reproduced with a fair degree of similarity, or adapted to new practices. This consists basically in the lists of activities (e.g. videos, triggering questions) and the description of how the activities were implemented.
- (ii) Practically, the thesis offers, in the end, design principles, which are insights on the practice brought to a more abstract scope than the activity plan of the Reflective Gaming Course. It is, however, still very closely related to practice. For instance, the reflections and suggestions about the way to approach cognitive gains of gaming could be said to be one of the design heuristics.
- (iii) Theoretically, it discusses a perspective on the studies of the influences of gaming, in which some studies could be turned around and seen under the perspective of players using the knowledge to improve their practices. In that case, researchers in the area of influences of gaming could design studies or at least develop reflections that address the relevance of the topic to the common player. Players can, then, more easily understand the consequences for their gaming practices and change it.
- (iv) Theoretically, it offers a proposal of game education that can replace, complement, or inspire reflection upon other proposals in the field of media education. Hence the concept of game education is widened by this thesis.

Every one of these four dimensions is embedded in practice and can inform new practices, following the pragmatic and DBR proposals.

3.2.3 Methods

This section is divided as: data generation, analysis, and presentation of the findings.

3.2.3.1 Data generation

The data from the thesis were generated using different methods. Those methods are briefly outlined below and described with further details in the correspondent chapters:

- (i) Study 1 was based on a series of 15 individual semi-structured interviews with university students.
- (ii) Study 2 investigated the Reflective Gaming Course in practice, and was based on my own observations while also tutoring, individual semi-structured interviews with the eight school students after the Reflective Gaming Course, surveys that students filled before the course and at the end of each session, and an interview with the teacher who supported the course.
- (iii) Study 3 investigated the second iteration of the Reflective Gaming Course, and the methods were improved: the 14 college students were interviewed individually both before and after the course, and in addition to new questions the interviews included short sessions of game play. There was also an external observer during all sessions in addition to my own as a tutor, and the surveys had different questions.

Additionally, the interviews and the sessions of the Reflective Gaming Course were audio recorded. The audio from the sessions was not transcribed; it was used as a memory aid during the later writing of observation report. Only particularly illustrative phrases were transcribed from the sessions. In the case of the interviews, they were fully transcribed with what Tracy (2013) defines as a mid-level transcription detail: meaning that the aim was to register all words said, and ignoring pace, sequence, intonation, volume, and verbal disfluencies, except when those were too blatant or seemed important to the basic understanding of what was said. This level of detail is appropriate to

develop the initial stage of the game education proposal. Future developments might focus on more subtle details. In the scope of this thesis the ideas that were clearly expressed are enough to address the research questions.

Particularly in Study 2 and 3, the combination of interviews, observations and surveys aimed to create a rich description of the RGC in practice. On the one hand, the methods complement each other because they aim to provide more evidence to support the perspective that I developed throughout the research period regarding what occurred in the classroom. On the other hand, different methods are more suitable to allow me to respond different research questions. The question about players' understanding (RQ1) is addressed by all methods: interviews (especially the ones prior to the course in Study 3, and the ones in Study 1), surveys, and observations (especially the observations of the initial ideas students expressed in the classroom). The question about players' experience (RQ3) is addressed mostly by the interviews (especially the ones after the courses, in which they were asked about the course), surveys, and observations (especially about the kind of interactions they engage with, such as their questions, comments, etc.). The question about the outcomes of the course (RQ4) is addressed mainly by the interviews at the end of the courses. The question about game education (RQ2) was initially responded by the literature review, but was further explored by the outcomes of all studies; hence to some extent all methods allowed the studies to inform the process of game education.

3.2.3.2 Data analysis

Some data sources did not need a coding strategy. It was the case of the observation reports and the survey answers of Study 2. In those cases, the amount of data was small enough to allow the researcher to make sense by reading through the data several times and making notes. Furthermore, the data was already divided by session, which also means a division by theme, hence the easiness to make sense of the data.

In the case of the interview data of the three studies, and also in the survey answers of Study 3, there was too much data to analyse without a coding

strategy. In those cases, a thematic coding strategy followed the recommendations of King (2004), which he named template analysis. In this method, a compromise is found between using prior interview/surveys questions as a coding structure and adapting it according to the needs perceived throughout the coding process. In the case of the Study 3, a comparison had to be made between the discourses that students made before and after the course, in which case the coding strategy was coupled with specific analytical strategies, which will be described in the Chapter 7.

The interpretation of the data raised some topics that were also of concern to early DBR researchers. One of them was the problem that Collins (1992) described as the consequence of the same person playing the role of researcher and intervention designer. It is expected that the designer of an educational intervention would wish that the intervention shows to be successful, and this wish can jeopardise the rigour of the data interpretation. The solution proposed by Collins to this problem is to have two different professionals to play the two different roles, which is hardly affordable in the context of a doctoral thesis. In this thesis, this was tackled mainly by keeping this problem in mind during the research process and actively searching for “negative” conclusions (i.e. conclusions that go against the conclusions I am taking) based on the evidence that was generated. Additionally, in the Study 3 I managed to have an external observer in all the Reflective Gaming Course sessions. The comparison between his report and my report aimed, among other aims, to moderate potential misunderstandings or biased views that I could have had. It was very important to know that the account I was describing of what happened in the sessions was coherent with what happened in the perspective of another educational researcher, who is also a trained teacher.

Another topic raised by early DBR scholars was the Bartlett effect (Brown, 1992). In other words, the bias when the researcher selects from the data only the parts that confirm her or his previous expectations. Robson (2011) describes three techniques that I employed in the data analysis which aim to improve the quality of the analysis, namely triangulation, weighting evidence and looking for negative evidence.

The first one, triangulation, is described as the practice of checking evidence from different sources and analyse whether they point to the same conclusion or not. For instance, if during a session students seemed to struggle to understand a particular topic, evidence on whether the struggle was something actually relevant can be searched in the data from the interviews and surveys, hence using a variety of sources in a way they complement each other. It is assumed that if more than one source of data is pointing towards the same conclusion, that conclusion is more trustworthy. Similarly, if different data sources are pointing towards different conclusions, it suggests that the conclusions are more unlikely, thus encouraging the reflection about other explanations.

The second technique is weighting evidence. In other words, considering how strong the evidence is to suggest the conclusion one is taking. For example, if a student mentions in the interviews that a game uses stereotypes, it is a lot less suggestive that the student is aware of negative gender stereotypes in games than if he actually had made a whole description of the characteristics of the female representation that make it problematic. The frequency of evidence – for instance, if five participants share a similar experience – was taken into account as well, because although those numbers do not support generalizations, they are suggestive of relevance in the specific scope of the study.

The third technique is looking for negative evidence. It means that ideally, for every claim made, evidence that refutes or suggests its opposite is actively sought. For instance, if the findings are suggesting that students found easy to understand one particular concept, it is good practice to check whether the findings also have any evidence that it is not the case. The practice of looking for negative evidence helps researchers to challenge their initial explanations in order to avoid reaching conclusions that are not consistent with their dataset.

3.2.3.3 Presentations of the findings

Qualitative studies often face the challenge of presenting to the reader an extensive amount of findings in a manner that leads to useful reflections and

conclusions. In the Study 1, the interviews have no specific order between them, and for this reason the findings are presented divided by theme, with only a few adaptations.

In most cases, Studies 2 and 3 follow a chronological sequence, i.e. in the Reflective Gaming Course, the second session came after the first, etc. Hence the Findings and Discussion sessions of the respective chapters (6 and 7) follow the chronological order of the sessions, creating a coherent narrative of the iteration (Barab and Squire, 2004). However, some adaptations were made in the chronological order to group the findings from similar topics together, e.g. the findings about violence generated in the interviews after the course were grouped with the other findings about violence, in the third session of each course. This organization aims to make the reading flow easier, and when it happens it will be clearly stated in the description, like in the following example: “later in the interviews the student said that (...)”, in order to differentiate from the findings originated in that session.

The practice of indicating the origin of the findings (e.g. interviews, surveys) will be a constant practice in the Studies 2 and 3. It is important to allow the reader to better understand the findings and allow her or him to assess the analysis and conclusions that resulted from the findings (Cobb et al., 2003).

In summary, the thesis employed interviews, observations and surveys to initially support the design of the Reflective Gaming Course, and then to generate a rich account of the implementation of the course in two different settings, which is mostly qualitative. When it was needed, thematic coding was employed to allow the researcher to make sense of extensive amounts of data, and the findings are presented divided by themes (e.g. cognitive gains, sexism) in each study, while in the Studies 2 and 3 it also means that they follow an order similar to the chronological sequence of activities.

3.3 Ethics

This section offers a description of the ethical procedures, including a reflection on some of the issues that arose. Although these issues were unlikely

to jeopardize the ethical legitimacy of the research project, they should be taken into account in future projects as they were in this one.

3.3.1 Approval from the Ethics Committee

All the studies of this thesis were approved by the Ethics Committee of the School of Education (University of Nottingham). In order to receive approval, some procedures had to be taken.

Before the submission, the procedure from the Committee requires that every researcher working with schools and/or underage subjects receive Disclosure and Barring Service (DBS), in order to guarantee that the researcher does not have issues with regard to past criminal activities and similar problems. It was done successfully through the University.

The application of the Ethics Committee requested the following information: research aims and questions, proposed methods of data generation, strategy to gain access to prospective participants, and drafts of the information sheets and consent forms. Additionally, I filled a form in which I confirmed that many ethical procedures were followed, such as informing the participants of the nature of the research, anonymising their identities, and others. The full form can be accessed in the website of the School of Education (www.nottingham.ac.uk/education).

Study 1 was based on individual interviews with adults about themes that were not sensitive. Consequently, the ethics application did not raise anything contentious, and it was accepted with a minor correction that one information should be present in both consent form and information sheet, whereas when it was submitted the information was present in only one of them.

Study 2 did not cause concerns for the Ethics Committee. It was based in interviews, surveys and the implementation of a course in a school environment, with the supervision of school staff. Again, the topics were not particularly sensitive, and the activities were not harmful. Different from the previous study, this one had participants aging from 14 to 16, and for this reason the consent form had to be signed by both students and their

parents/guardians. Once more, the application returned from the Committee with only minor corrections about having to repeat information in the two documents and no further issues.

Study 3 was essentially the same as Study 2, with the exception of the age of students, whose age varied from 16 to 18. I considered that 16-years-old students do not need special authorization from their parents to attend to a course implemented in their college, and that it was not exposing them to anything harmful. So a request was made to the Ethics Committee to implement the study with the consent of the students only, and with an informative letter sent to the parents to inform them and allow them to manifest any concern that they could have. This approval was accepted by the Ethics Committee.

With the studies approved by the Committee, all the ethical procedures described in the documents were followed in practice. Every participant had access to an information sheet and was informed orally about the nature of the research, as well as the possibilities of quitting the research project with no consequences for the participant. Participants also consented to participate and to be audio recorded. They were informed that their identities would not be revealed in any report. They were informed about the nature of the data storage. The contacts of my supervisors and the Ethics Committee were provided in case they wanted to report any issue.

3.3.2 Ethical reflections

This section begins describing the basic ethical procedures, then reflects on some points that had the potential to be considered problematic, and ends up describing some ethical initiatives that goes beyond *avoiding damage*. In other words, ethical procedures that enabled respectful relationships with research participants.

The research process was implemented in a respectful way, avoiding exposing students to any embarrassing situation, placing them under pressure, or making offensive statements or criticisms. The activities involved were:

- (i) They were asked to answer questions in an individual interview and the questions touched no particularly sensitive topic (Studies 1, 2 and 3).
- (ii) Some of them attended to courses about Reflective Gaming led by me, (Studies 2 and 3) and there was hardly more potential harm in that than it would have in conversations about games that they could have with colleagues.
- (iii) During the course and, in some cases, immediately before some interviews, participants were asked to play games (Studies 2 and 3). The games they played individually in the Study 3 were Tales of the Monkey Island (Telltale games, 2010) and Rock of Ages (Atlus, 2011), which have both a PEGI classification of 12 years old (whereas the participants of that study were all 16 or older). The games played during the courses (Studies 1 and 2) were simple browser games and most of them have no PEGI classification, but there is no reason why any of the games would be improper to their ages. The games were Portal: the Flash Game (We Create Stuff, 2007), Cyclomanics 2 (Kongregate, 2011), Auditorium (Cipherprime, 2008), Solipskier (Mikengreg, 2010), and 3rd World Farmer (ArcadeTown, 2005).

However, there are some potential issues that should be taken into account, despite being relatively subtle or, in some cases, unlikely to manifest as an actual problem. The first one, raised by Fantin (2010), is when she discusses the danger of transforming games into a *scholastic* activity, devoid of its aspects of spontaneous and unpretentious play. Buckingham and Scanlon (2003) are also alert to the problem of the colonization of the leisure and entertainment spheres of young people by schooling. So far there is no evidence that educating about games spoils the gaming practices of learners, either by suggesting that gaming is not a legitimate and positive leisure form (which perhaps could make students afraid or shameful of playing) or by preventing learners to engage in practices they enjoy. For instance, if students become excessively worried about the positive influences of the game and struggle to immerse in the activity. These two hypothetical dangers would be

the opposite of a very basic understanding of game literacy described by Squire (2008): “expertise in designing rewarding experiences for oneself within a gameworld” (p. 644). In other words, to spoil the entertainment of players could be considered to encourage *game illiteracy*, or players would not be able to use games to what is often considered the main purpose of gaming.

It is possible to conjecture that game education proposals that try to conform students in a normative model such as the proposal of Klimmt (2009) are more likely to fall into this mistake. Contrastingly, the current proposal considers the autonomy of players crucial and also takes into account the positive influences of gaming. These characteristics were expected to decrease the chances that the course would spoil the positive engagement of learners with games, and although it was not a topic addressed in its particularity in the research instruments, during the interviews with students about their experiences in the course and its perceived impact no evidence was found to suggest that the course was hindering gaming practices.

Moreover, gaming practices can be a sensitive topic amongst family members, and there was the potential that some parents would not want their children to attend to the course. Some beliefs that could lead to this decision would be the idea that (i) the course could condone practices that are not allowed in the family context (i.e. gaming), (ii) that students would be stimulated to play more or excessively, or (iii) that students would be exposed to points of view that are not shared by the families. We can conjecture further and suppose that some parents would believe their children are being “brainwashed into a feminist agenda” or similar ideas. Clearly, these beliefs had little to do with the actual proposal, but the consent form that parents signed for the first version of the course offered the option to contact the researcher or his supervisors to clarify any detail of the course in case one of the parents had strong opinions about gaming. In the case of the second version of the course the same contact information was available in the letter sent to the parents. In both cases, hypothetically students could also have such concerns, and if it were the case they were free to withdraw from the study at any point with no negative consequences for them.

Another ethical concern involved the coverage of sensitive topics such as sexism and racism in the Reflective Gaming Course (Studies 2 and 3). The approach taken in the two studies was to introduce the topics and allow students to discuss them, and in those cases I limited my participation in the discussions to make brief comments about the topic and propose questions to feed the discussion and keep it on a productive track. It was in accordance with the proposal, which intended to encourage informed reflection instead of impose the “right perspective” about the topics according to the tutor. Consequently, the potential ethical problem was not that students would have political views imposed on them, but the opposite: that I would not challenge manifestations of racism and sexism with enough vigour. This problem placed me in a complicated position, which I believe many teachers can face in their teaching practices. How is it possible to react to the expression of a sexist/racist opinion, in a manner that does not allow the classroom to become an environment where sexism and racism are reinforced, while at the same time intervening in a manner that is respectful to the student and does not discourage students from engaging sincerely in the discussions? There is no clear-cut answer to that question, and a reflective teaching practice in this respect is the instrument the tutor had to tackle it when it appeared. In the case of the research practice of this thesis, this problem appeared in the Study 2, when some reflection about the session after it had finished made me conclude that I should have been more emphatic about the problems of sexism. The solution I found in that particular case was to address the topic differently some sessions later when we reviewed the topic, when I expressed clearly my position regarding those matters. More details about this episode can be found in Chapter 6.

Moreover, it was considered an ethical practice – as well as epistemological one – to undertake research that allows participants to express themselves, hence avoiding to underestimate participants and to reach conclusions about them without hearing what they had to say. In Study 2 it manifested as the inclusion of questions in the individual interviews with regard to the research premise, in other words, students had the chance to express their opinions about the research. In the survey at the end of sessions, students also were

asked about suggestions. In the last session of the course there was also a group interview in which students were asked to redesign the course, which is consistent with a belief that young people can have important contributions to make if their voices are heard. Unfortunately, the group interview ended up not working well, probably for some practical reasons, see chapter 6 for details. In Study 3, once more students were asked about their opinions about my research premise, and their voices, heard – both in interviews and in surveys.

It was a research practice not only to create opportunities to hear participants' voices, but also to respect their autonomy to preserve their playful practices as they wish. I wanted to avoid a pretentious position of someone who *knows what is better for players* regarding their leisure practices, hence treating respectfully the gaming spaces. It was manifested explicitly in the game education model and was a concern that permeated the research practice.

In this chapter the thesis was contextualized as adopting a pragmatic epistemological stance, using Design Based Research as the methodological approach. It also described how these general instances related to the particular case of the thesis, described some of approaches taken to research methods, described the ethical procedures taken, and made some further reflections about ethics. This has set the scene for the detailed discussion of each study in the next chapters.

4. STUDY 1: PLAYERS' PERSPECTIVES

4.1 Introduction

In order to develop the basic premise of this thesis, which is a game education proposal that includes the influences of gaming, the first step in terms of empirical research was to deepen my understanding of the perspectives of players regarding the influences of gaming. An initial investigation of learners' perspectives in order to design pedagogical interventions was something coherent with the pedagogical approach of this thesis (Dewey, 1902/2011; Freire, 1970/2005). It has also been suggested by Zagal (2010) and Apperley and Beavis (2014) in their discussions about designing game education practices. This is implied in the first research question: How do players understand the influences of their gaming practices?

To be more specific about the research addressed by this study, two sub-questions were defined:

- What do players do with games?

This question was necessary to set the gaming context of players, as the influences of gaming do not occur in isolation, but are connected with the games played, the amount of time spent, etc. Therefore this question aimed mainly to set the context for the others.

- What are players' practices around games?

This complements the first question, because some influences of gaming can be related not to the activity of gaming *per se*, but to activities that are related to games, namely: the conversations with peers and parents; the online interactions; the cognitive connections that players make between game themes and school themes; and the use of external resources to learn about game themes. This list is not exhaustive but it describes the scope chosen for this study: peers, parents, school, and Internet. This question is important to expand the focus to gaming activities, including the potential influences that emerge from activities triggered by gaming.

The answers of these research questions are used to inform the design of a game education course that relates to players' perspectives and experiences. In order to do so, in accordance to the theoretical framework of this thesis, my own experience as a game researcher, a student, and a player needed to be enriched with the perspective of other players and students.

4.2 Research methods

This study employed individual interviews with players to generate the findings that respond to the research questions.

4.2.1 Participants

Invitations were sent to students from the University of Nottingham organisations associated with games or computers, calling students who would accept to share experiences regarding digital games from the time they were at school. 15 participants responded (14 male, and 1 female). Their average age was approximately 22, ranging from 19 to 32.

The Studies 2 and 3 were conducted in schools and colleges, hence participants were younger than the participants of this initial study. Older players were chosen in the current study because I wanted participants who were able to elaborate on their prior experiences in school from a distance instead of being immersed in it. Moreover, at that point the age of participants in the course was completely undefined, therefore there was not a specific age group to address. And finally, addressing university students had practical advantages that allowed this preliminary study to be conducted with agility.

4.2.2 Interview structure

The interview was designed to address players' perceptions of the influences of gaming, both positively and negatively. It employed a combination of generic questions, e.g. whether and why gaming is good for the player, and specific questions, e.g. asking about previous tangential learning experiences (learning about game themes through external sources). The aim of this particular set of

questions was to offer plenty of opportunities for participants to reflect, elaborate, explore and express their perspectives about gaming.

The first questions addressed their profile, asking for their gender, age, course, nationality, favourite games and estimations of hours of play per week. The following 28 questions had to be answered in a scale. In some cases the question was an affirmation, such as “Playing games is good for me”, and participants had to fill an agreement scale, i.e. from completely disagree to completely agree; in others, the question was a exploratory question, e. g. “Did you participate in any use of digital games at your school?”, and participants had to fill a frequency scale, i.e. from never to very frequently. In both cases, they were asked to comment their answers, and the findings are predominantly based on their oral answers, which were sometimes elaborated, and sometimes straightforward. Their answers in the scales complemented the oral answers and occasionally supported the analysis, but the main purpose of the scale was to encourage participants to take a clear stance about each topic.

The interview was semi-structured, thus, I could ask extra questions to encourage participants to share their experiences, in a more conversation-like interaction. Three of the questions [19, 20 and 21] addressed the details of the connections between game themes and school themes, and were asked only if the participant reported any significant connection.

The organising framework was adapted from the Gaming Involvement and Informal Learning (GIIL) framework (Iacovides et al., 2014). They proposed three categories of *how* people learn informally: through play, through interaction with others, and through external resources. There are also three categories of *what* people learn informally, which can be on a game level, on a skill level and on a personal level. Most categories have subcategories (described in Section 2.1.2). The main adaptations made were to exclude all informal learning about the game itself, i.e. learning on a game level, to focus on the influences that influence contexts beyond the gaming context. Another adaptation was the inclusion of negative influences, which are not explicitly addressed by Iacovides and colleagues. Both adaptations were made to serve

the need of designing the game education course. Futher categories were added because they too addressed topics of interest:

- (i) The problem of excessive gaming was directly addressed, because although it cannot be considered learning, I considered a potential influence of playing games, as I explained in Section 2.1
- (ii) Game design practices were investigated, because of the claims of the positive influences associated with this practice (e.g. Zimmerman, 2007).
- (iii) The use of serious games was investigated, because this study did not exclude the formal learning possibilities.
- (iv) Connections between schools elements and game elements was strongly emphasised, because it is an underexplored topic that my research aimed to tackle (see section 2.1.3).
- (v) Although the GIIL framework considers *interaction with others* as a way that people learn, in this study the emphasis was to investigate whether those interactions support reflection about the influences of gaming, or at least reflections that are not restricted to the gameplay. In other words, whether and how peers, parents, online communities and media play the role of game educators, as it is understood in this thesis.

The questions are available in the next tables, and were divided according to the specific research questions that they mainly address. It is noteworthy that the order they are presented in the tables is not the original order they were asked, so the numbers of the questions were maintained to allow the reader to see the original order. The first column presents the code that was most frequently employed to the answers of the correspondent question.

Table 1: Codes and questions referring to the RQ: "What do players do with games?"

Codes	Interview questions
Gaming	1) Please write the name of up to your 6 most preferred

practices	games and what do you think that influenced you to play these games?
Gaming practices	2) Number of hours you spend playing digital games every week currently:
Gaming practices	3) Number of hours you used to spend playing digital games every week at the time you used to play the most:
Gaming practices	4) “My preferred games help me relax”
Gaming practices	5) “My preferred games make me stimulated”
Gaming practices	6) “My preferred games require complex problem solving”
Gaming practices	7) “My preferred games are repetitive”
Design practices	14) How frequently do you use scenario editors of games?
Design practices	15) How frequently do you use modding games?

The questions of Table 1: Codes and questions referring to the RQ: "What do players do with games?" allowed me to have a glimpse into participants' perspectives of gaming, and it supported the flow of the interview. For instance, sometimes throughout the interview I would refer back to their favourite games in order to support their reflections or to clarify something they had said. Also, these questions had the function of "warm-up" (Robson, 2011, p. 284), thus helping me and the participants to settle down by approaching topics that are close to the main interview themes, but not central. These questions refer mostly to the perspectives about the games themselves.

Table 2: Codes and questions referring to the RQ: "What do players believe about the influences of their gaming?"

Codes	Interview questions
Reflections, Learning (skills), Learning (personal), and Reflective Gaming	8) "I think about the benefits I will gain when I choose a game to play"
Reflections, Learning (skills), Learning (personal), and Reflective Gaming	29) "I usually reflect about the games I play"
Learning (skills) and Learning (personal)	26) "Playing games is good for me"
Learning – skills	27) "I develop skills playing games that are useful out of the game context"
Learning – personal	28) "I learnt about facts or content while playing games that are useful out of the game context"
Negative aspects	22) "Playing computer games is bad for me"
Negative aspects	23) "My game habit hindered my studies"
Negative aspects and Learning (Personal)	25) "The games I have played changed my beliefs and attitude"

The questions of Table 2: Codes and questions referring to the RQ: "What do players believe about the influences of their gaming?" refer to the influences of gaming. The categories described by Iacovides and colleagues (2014) of skill learning and personal learning were used as a basis to design the codes for

those questions. These questions address learning that does not fit in the game level category; in other words, the learning which originates from gaming but has consequences out of the gaming context. However, this study is interested in negative influences as well as positive, hence the inclusion of questions about negative influences. They can be seen as negative learning, i.e. incorporating stereotypes to their set of beliefs, or as gaming practices that harm other spheres of life, e.g. excessive gaming. Furthermore, some questions focus on reflective gaming practices, which are associated to the RQ "What do players believe about the influences of their gaming?" because my interest was to investigate whether and how their reflections address the influences of gaming.

Table 3: Codes and questions referring to the RQ: "What are players practices around games?"

Codes	Interview questions
Interactions with others	11) Do you usually talk with someone about the games you play?
Interactions with others	12) How frequently, when you were younger, did you talk about games with an adult?
Interactions with others	13) How frequently do you access online communities concerning games?
Connection game-school	14) Did you participate in any use of digital games at your school?
Connection game-school	15) "There were lots of relationships between digital games and my school experiences"
Connection game-school	16) "Some of the games I used to play taught me something that school also taught me"

Connection game-school	17) How frequently during your school education did something you experienced in school remind you about a game you had previously played?
Connection game-school	18) How frequently during your school education did something you experienced in a game remind you about a school topic you had previously learnt?
Connection game-school	19) “The connection made me more motivated to play the game” (dependent on the existence of connections)
Connection game-school	20) “The connection helped me to learn the school content” (dependent on the existence of connections)
Connection game-school	21) “My experiences with the game changed after I made the connection” (dependent on the existence of connections)
Connection game-school	31) “In the future games will be an important educational tool in schools”
External sources	30) Did any game made you so motivated about a topic that you looked for more information from other sources?
External sources	24) Have you seen something in a game that later you figured out was inaccurate?

Finally, the questions of Table 3: Codes and questions referring to the RQ: "What are players practices around games?" refer to relations between games and other contexts, such as school, external sources of information, family, friends and Internet. It focused on the alternative ways to learn described in Iacovides and colleagues' (2014) taxonomy, which they called learning

through interacting with others and *through external sources*. However, in this study I was not interested solely in what and how people learn through these different forms, but also whether and how these interactions (e.g. with family) influence and are influenced by their gaming practices, especially with regard to the encouragement of reflective modes of play. Because the connections to school were of particular interest, and is a topic that previously has received little attention of scholars, eight questions tackled the topic from different angles in order to deeply explore participants' prior experiences.

A list with all the interview questions can be seen in its original order in Appendix 1.

4.2.3 Data analysis

The interviews were audio recorded, and the audio was transcribed. Later, the data was coded according to the set of codes described in the tables. The relation between the codes and the interview questions can be seen in *Table 1: Codes and questions referring to the RQ: "What do players do with games?"*, *Table 2: Codes and questions referring to the RQ: "What do players believe about the influences of their gaming?"*, and *Table 3: Codes and questions referring to the RQ: "What are players practices around games?"*. A list with the codes is presented below:

- Gaming practices
- Design practices
- Reflections
- Informal Learning - skills (sub codes: psycho-motor, cognitive, social, numeracy, literacy, technical)
- Informal Learning - personal (sub codes: general knowledge, emotional development, cultural development, career influence)
- Negative aspects
- Interactions with others
- Connection game-school
- External sources

In some cases, aspects of the interview were coded with more than one code. This decision is not problematic because the codes were used only to organise the data by themes in order to allow the researcher to make sense of the data. No statistical or numeric analysis was conducted with the coded data.

The presentation strategy of the findings aims to provide a clear summary that is consistent with the data. In some cases the discourses of participants had strong similarities; in such cases they were grouped and their ideas were summarised. In other cases individual participants had specific perspectives and so each is described. Clearly, when dealing with this kind of qualitative data, the parameters which define the similarities and differences amongst participants is never neutral, and choices in this regard were made according to the objectives of the study, while aiming for an honest representation of what was said.

4.3 Findings

In each section the main ideas will be described and linked to the correspondent participants, and some quotes will be used to illustrate the ideas.

4.3.1 Gaming practices

The questions about their gaming practices generated a large amount of data regarding their opinions about games themselves, i.e. favourite games, opinions about the relaxing, stimulating, complex and repetitive aspects of gaming. These were warm-up questions, as the main objective of the study was to explore the influences of gaming beyond the gaming moment. Therefore, the findings will focus on the influences of gaming, and their answers about gaming preferences will not be described in detail.

However, it is noteworthy that some of the topics addressed in this section have been associated with the influences of gaming in the wider research literature. This is specifically the case for stimulating games (associated with cognitive gains), repetitive games (associated with excessive gaming or waste of time) and complex problem solving (associated with cognitive gains). However, while discussing these aspects of their gaming practices, almost no

one commented upon this with the only exception being Edward, who associated complex problem solving with influencing his career in computer science. Other influences of gaming did not emerge before the first question that addressed it directly and so these issues are only considered with respect to those questions.

Moreover, I find it necessary to make a clarification about the role of gaming as a “relaxing/fun” activity. In this study I am not focusing on this aspect of gaming as it has less relevance for a reflective gaming course, but a different perspective of influences of gaming could surely include leisure dimensions of gaming, as it does influence one’s life. Therefore, the reader should not be misled to believe that this aspect was not mentioned by participants. It was addressed directly in the interview and was also widely described by all participants as one of the main reasons for gaming, if not the most important. In some cases this had a particularly important role: Lewis and Donald found refuge from a bullying context in schools, and Peter was not alone when he said that gaming “is good to me, it helps me relax. I mean, otherwise I’d just get stressed out beyond oblivion and would have a break down”. Hence, although it is not within the scope of this study, aspects such as relaxation, fun and antidote to boredom appeared as important roles of gaming in participants’ discourses.

The initial questions also revealed the participants’ estimations of time of play:

- The average estimated time of game play per week *around the time of the interview* was approximately 11 hours and 40 minutes, ranging from 1 to 30 hours.
- The average estimated time of game play per week *at the time of their lives they used to play the most* was approximately 37 hours and 50 minutes, ranging from 8 to 110 hours.

4.3.2 Design practices

The design practices mentioned by participants were very limited. They were:

- Peter described he “had a look” in both modding and map creation, but did not “stick on it in order to learn it”.
- Jack made maps of Warcraft (version not specified), describing this as a rare practice.
- Hannah made maps on Command & Conquer: Red Alert (Virgin Interactive, 1996), describing it as an occasional practice.
- Nash used to use a mod tool to create a new skin for an online character, describing it as an occasional practice.
- Gary used to enjoy map creation, describing it as a frequent practice of the past. He also tried to mod games, but “didn’t make any progress”.
- Billy enjoys game creation, map creation and modding, describing them as frequent practices. He also described he had coded some simple games from scratch.

In summary, only Billy and Gary seemed to engage with those practices more seriously, whereas Nash, Hannah, Jack and Peter had some isolated cases to share. The other nine participants stated that they have not carried out those design practices, although some described playing with other people’s maps and mods.

4.3.3 Reflective gaming

Participants were asked about their reflections about games in general and about the benefits of gaming in particular. The reflections regarding the benefits were as follows:

- Billy, Donald, Ian, Jack, Marc and Peter declared that they do not reflect about benefits in any sense, illustrated by Marc when he said: “I think when I just play, I just play. I don’t think there is any... I don’t even think about it. It’s just something you do”, and Peter: “I don’t very often sort of sit down and sort of go ‘what this game is doing for me as a person?’ So, not really”.
- In the case of Ander, Carl, Gary, Edward, Ian, Kurt, and Peter, they declared that they only think about having fun, relaxing or socialising. Most of them did not see this as beneficial; for example Ander: “I don’t

care about the benefits. I just go to play games to relax" and Edward, who compared games to films:

It is kind of like a film. I get a film to watch it and enjoy it. I get a game to play and enjoy it. You wouldn't really get a film to learn that much, I suppose, would you? You wouldn't think about the benefits of renting a film or something.

However, in the case of Carl and Peter, fun and relaxation were considered benefits of playing.

- Lewis and Nash were the only ones who described taking into account the potential benefits of gaming, besides having fun, at least some of the time. Their descriptions are quoted below, first Lewis and then Nash:

Sometimes I think 'this sounds fun' and I also think about, you know, like, say, it will like teach me some more, like, it will teach some. It's also, like, I am not playing just because the games looks fun, I also play it because let's say the setting, or, say, it is set around a certain mythology, some that I am interested in. And I will learn more about that, potentially (...) a lot of games I mainly chose for entertainment but some... a very few games I do choose because it looks fun and it could also educate me.

I will think 'what can I get from this game' before start to play it. But for some games that I really like, like Diablo 3, I don't care about what I will get. I just like it. So I play it. But, like, the game [undefined title], this kind, I think 'I play this game I can train my reaction' so that is a good way to train myself to think faster. So I will think about it.

In addition, participants discussed reflections that are not directly related to benefits of gaming:

- Nine participants described reflecting upon how to improve their performance in the game: Ander, Billy, Hannah, Gary, Kurt, Lewis,

Marc, Nash, and Peter. It is illustrated by Gary: “I reflect about how I played the game. And how I can play better”.

- Carl, Edward and Oswald declared that they reflect about the narratives or messages of games. Edward and Oswald described reflections focused on the narrative, illustrated by Oswald: “I usually have the kind of thoughts about the story behind the character. What was happened in video games, why did the main character make that choice”. Carl described reflections about how different games address important themes implicitly; he gave the example of games that deal with racism in ways that made him think about it.
- Carl and Jack described reflections about the quality of games, analysing their graphics, gameplay, etc. For example, Carl said: “I’d think about how well made it [the game] was. I suppose it is similar to when you are watching a movie, are you are thinking about the acting and everything”.

In summary, the influences of gaming was something commonly taken into account by only two participants. The reflections of the other participants seemed to be limited to the games themselves.

4.3.4 Learning of skills

The skills that participants reported they learn were organised in accordance to the GIIL framework (Iacovides et al., 2014). Thus it follows the order: psychomotor, cognitive skills, social, numeracy, literacy and technical knowledge.

4.3.4.1 Psycho-motor skills

Three participants discussed this. Billy mentioned improving his motor skills and hand-eye coordination; Lewis said gaming has improved his reflexes and hand-eye coordination, and Oswald said it benefits his reflexes.

4.3.4.2 Cognitive skills

Cognitive skills were the most cited skills, and a variety of them were cited. However, not all participants did so.

- Five participants did not say anything with this regard (Carl, Edward, Hannah, Ian, and Kurt).
- Ander mentioned increased memory.
- Oswald mentioned learning through trial and error.
- Nash mentioned quick thinking.
- Donald, Peter, Marc and Jack mentioned problem solving.
- Gary mentioned strategic thinking, critical thinking, and active thinking.
- Lewis mentioned planning in advance, logical reasoning, and prioritising.
- Billy mentioned management skills, multitasking, better reaction times, and inductive reasoning.

Very often these skills were just mentioned, but in a few cases they were explained at length. The quote of Donald below illustrates a simple explanation:

I go around things in a specific way because my experiences in life whether that be games or not games. Like, everyone has a different way of going about a problem, I don't know, it is like... Normally with problems you take the experience which you gathered from other things. Whether that be games or not games.

An example of a more sophisticated description of cognitive skill is the one shared by Billy:

Inductive skills as well. Like, looking at a game and try to think what is actually happening inside the game. So, for example, fighting games... well, almost any game, when I am playing against the computer, I become to work out what the rules the computer is using. So rather than trying to beat the game, I try to beat the higher level of the game.

A unique example was this optimistic description from Lewis of how gaming increased his intelligence:

I used to just sit inside my house watching television. And I started playing games, I started, basically, becoming... I don't know why, but I seemed, when I was younger, I seemed to hit like a wall in intelligence. I couldn't do basically anything intelligent, like, then... I don't know what happened, but I seemed to break through that wall, and just like... my intelligence just seemed to increase from the... like, I wasn't the smartest of the smart, but I was considered quite smart by people. And... basically I would kind of credit this... it was right on the time I started playing games, I don't know if it was a coincidence, but... it helped think more, and just like... TV is basically disengaging, you just watch. But when I started playing games like, more educational games, or games, like I said, when my dad made me try to think more logically, yeah? (...) for ages I couldn't read the time in the clock, I couldn't read the time, and then... I started gaming, and everything after that just seemed to be easier, like Maths, and literacy, I could... for some reason, my intelligence just took a leap... I could spell words I didn't even know the meaning of them before, like... and it just kept on going on from there, I was like... increased my intelligence.

In addition to the descriptions of the skills that participants perceived they had developed by gaming, some participants also shared opinions about the *process* of cognitive learning. Oswald commented about his belief about the diversity of cognitive learning that derives from gaming. He said: "I think gaming is an environment to people to learn. So different people have different thinking, so they can learn differently from the same video games". Gary added that that sort of learning does not occur consciously:

I think it is more like subconscious sort of thing. Like, you are not... you wouldn't think 'wow, I know how to do this because

of X videogame', you just kind of do it. I think it is more a subconscious think, yeah.

And finally, Peter mentioned having read about it, and pondered about whether it applies in his case, also commenting about the difficult to perceive it. He seemed to consider it a possibility instead of taking it for granted:

I read about people who were saying... I read studies that were saying that... people develop problem-solving skills with games. And certainly I did play a lot of puzzle games... so I suppose it must have effected me, but it's not something I am really aware of. So I would assume so. (...) It's not something I am aware of. (...) I am not sceptical about it, I actually strongly believe, that yes, games help people... but I am not aware of it doing on me.

In summary, many participants mentioned a variety of cognitive skills, and a few participants elaborated upon these and shared quite detailed opinions about it.

4.3.4.3 Social skills

A few participants described some social skills that they felt developed through gameplay. Billy said that games helped him to manage situations where he cannot satisfy all parties. Lewis and Nash mentioned they learnt about teamwork, while the latter also mentioned communications skills and becoming friendlier as a person. Oswald said that he experiments taking decisions in games with social interaction (e.g. Mass Effect (Microsoft Game Studios, 2007)), and reflects about his social interactions.

It should be noted that in different parts of the interview gaming was described repeatedly as an activity that plays an important role of socialisation to participants. The skills mentioned above are only the ones that were described as skills that are developed, and do not refer to the socialisation importance of gaming. This importance is illustrated by a quote of Carl: "generally all my friends are being in that sort of group, all enjoy games, so I probably wouldn't

have as much to speak about, really”. However, it is not the focus of this study despite its presence in the participants’ discourse.

4.3.4.4 Numeracy, Literacy and Technical knowledge

The skills regarding numeracy, literacy and technical are grouped together because respondents said very little about them, and because they have similarities in the kinds of knowledge they refer to:

- Regarding numeracy, Ander mentioned that he had difficulties with numbers and counting, and playing digital card games helped him.
- Regarding literacy, Billy said he improved his reading skills because of the amount of text in some games, Hannah said she improved her English, and Lewis said he learnt some French, both as second languages.
- Regarding technical knowledge, Hannah described she had learnt about cars playing racing games: “I learned some technical stuff about the engine or the wheels. I learned a lot of things about cars”, and she also explained some of the knowledge she acquired.

4.3.5 Learning (personal)

This section is also organised according to the GIIL framework, therefore it has the following sections: general knowledge, emotional development, cultural development, and career influence.

4.3.5.1 General knowledge

With regard to general knowledge acquired by gaming, there is some overlap with the connections between games and school and with the use of external sources. However, they are three different learning aspects of the same game theme. For instance, learning about the Roman Empire can fit in one, two or all of these categories.

In order to organise the kinds of approach to general knowledge from participants, they were divided in three groups: the ones who did not declare to

learn anything, the ones who were more optimistic about it, and the ones who were more critical or sceptical.

- Ander, Donald, Hannah and Oswald did not mention any general knowledge that they learnt with games.
- A group of six participants declared that they learnt a variety of topics while gaming. The most common were historical topics, mentioned by Kurt, Lewis, Marc, Nash, Jack and Billy, such as Roman Empire, World Wars, Greek history, and Middle Eastern history. Geography topics were mentioned by Billy and Jack. Mythology was mentioned by Nash and Lewis. Some topics were mentioned just once: Marc mentioned football knowledge, Lewis mentioned learning physics, about the property of Helium, and which wild animals are poisonous. Billy shared a judgement about this kind of learning: he talked particularly well about his learning experiences with games, and I asked him whether he believed he learnt more history in games than in school. In his response, he also comments about learning with documentaries, and compares the three:

Absolutely [I learnt more history from games than school]. History lessons at school were terrible. (...) But I would say that I learned less from computer games than from documentaries. On TV. (...) Documentaries and games, than, school.

Billy's statement that he learnt more with documentaries, than from games and school is not representative of the group of six: it illustrates the most optimistic perspective about informal game based learning – or the most pessimistic about schools.

- Five participants deliberated about the usefulness of the general knowledge acquired by gaming. Ian illustrates this perspective:

It also depends on what kind of games you play. Because, for me, when I play a game it's like... Assassin's Creed, actually you learn a bit about history on that but it is not to that extent that you'd actually go out and learn something and you can present to the outside world.

Gary would describe the context of gaming as not encouraging for learning:

I don't know if you've played like Assassin's Creed, but it is based in Jerusalem and there is one based in Rome or whatever, I mean, you kind of learn dates of when the crusades where, stuff like that. But you kind of go 'wow, that was interesting', and I forget about it. So I'd say you probably learn a few things. But you don't... because you are not playing for the learning, you are playing for the game, you kind of forget about them. So I wouldn't say they are very useful outside of the game context.

Carl and Peter considered the learning possibilities very minor. In the case of the latter, he said: "You might pick up, like, the weapon names, and the different ways the different kinds of weapon work, I suppose? But apart from that... But nothing major". In the case of Carl, because he had Civilization 5 (2K Games, 2010), which is sometimes associated with learning about history, as one of his favourite games, I asked him directly about that, and he said:

Very, very minor [learning], really, because it is like I said before, in those games you can sort of shape history to something that it wasn't. I know that it is an extreme example, but on Civilization you can play the Aztecs and they can invent electricity before, say, America. I would say... yeah, it's probably... even though they are so based on real life, it's not really... You don't learn anything from it, really.

And finally, Edward considered that the fictional aspect of games makes it a problematic context for learning, unless external sources are checked. He said:

I think about Assassin's Creed and things like that. That's kind of history-like, isn't? But I don't know how many facts I took away from that. (...) I think you'd learn little bits, maybe, from American history. But then again, I am not sure of that is

actually accurate. Or useful to me that much...(...) If it was something that I was interested in I would probably go and look it up. On Wikipedia. See if I am going to rely on some piece of information I'd probably double check that that was right first.

In summary, one group of participants declared that they learnt a variety of topics by gaming, especially historical ones, but there was a contrast between them and other participants who had a more critical or pessimistic perspective about what is learnt in those contexts. A few students simply did not state they learnt anything.

4.3.5.2 Emotional development

Although most participants said nothing about emotional development, the ones who did expressed a variety of ideas:

- Most participants did not mention anything that fits in the category emotional development (Ander, Billy, Donald, Edward, Gary, Ian, Kurt, Marc, and Peter).
- Carl described that he developed ethical decision making.
- Jack said he developed persistence when facing failure, or learning with his mistakes; illustrated by: “From all the games I played (...) they teach never to give up. (...) Even if you fail, failure is a part of success. It is just one step behind success”.
- Hannah described that she became more competitive. In her description, however, it seems that she means becoming more confident to engage in a male dominated environment:

I was less competitive in some areas, and I became more competitive. (...) Everybody was and I was the only girl. And I was feeling... but they told me ‘do this! Do this!', ‘Ok', and I did well. And it worked out, so I learned something from that.

- Nash said he developed courage, to remain serene when facing stressful challenges, and a sense of humility. He described the sense of humility he developed by playing World of Warcraft (Blizzard Entertainment,

2004), saying that “you have to be team work, you have to sacrifice your hero issues about that”.

- Oswald described how he learnt to be patient, and to learn with his failures. In this regard, he said that “it is up to the players. If they realise the lessons in there. There are always lessons in video games”. He also talked about the opportunities to practice ethical decision making in some RPG such as Mass Effect (Microsoft Game Studios, 2007). He said:

Some games teach me some ethical lessons in life. Because usually in a role-playing game some character dies or something, or maybe there is a love story happening there. So, that story teaches me something in life. Give me some ethical lesson(...) they give me lessons about love, about friendship, about ethics. I changed my behaviours according to the games I play (...) Improve like relationships, or the way I treat people. Especially the way I treat people. It's not really the same as I was. As it was, in the past. (...) before playing some awesome games I had some passive thinking about things around me. So when I play video games that character changed positively. About the things around me. Sometimes I try to mimic that. I try to learn that from the character. About thinking positively and.. yes I did it. Somehow it changed my thinking about things around me.

- Lewis said that gaming increased his sense of responsibility, giving the example of the game Fall Out (Interplay Entertainment, 1997), which uses a system of good and bad karma to define what happens in the game, hence encouraging good actions in the game. He also described the positive role models from games that inspired him:

I used to watch wrestling, they used to be like, big men fighting to earn some money and then they used to get arrested or, like, pulled over for drugs (...) But when you have someone who has one goal, like, save the family, basically they can be tempted by money, by power, women, anything they want. And nothing

will stop them from being true to their family and fighting for what they believe in. Stuff like that. Because, basically, these role models are human, role models that have will power, will not crack on any pressure... basically they'll be understanding, be true, be right to the end. And there was some of them that they make more human, they collapse under pressure and stuff like that, but most time they will actually present good role models because a lot of children play these games, you know, you want to promote things that children should want to encompass like... courage, bravery, honour, friendship, stuff like that, trust. That's why I say, personally for me, I'd taken some good characteristics from, like, game characters as role models.

In conclusion, although most participants did not mention anything that fits in the category of emotional development, some described a few different ways they felt influenced positively by gaming.

4.3.5.3 Cultural development

There were a few references to games allowing informal learning about other forms of art, which is one of the aspects of cultural development referred to in the GIIL framework (Iacovides et al., 2014). Some of them were described in other sections: Hannah and Oswald mentioned their interest in some specific musical styles employed in games; Kurt mentioned his interest in the Batman universe, Carl read books related to two games, and Hannah also found interest in the books and films based on the work of J. R. R. Tolkien due to the Hobbit game (Sierra Entertainment, 2003).

4.3.5.4 Career influence

Edward, Gary and Jack said that gaming has encouraged them to study computer science, and commented about the relation between the two, involving problem solving and familiarity with computers. This is illustrated by Edward:

I think maybe the mind-set from games is similar to the mind-set that you need in computer science to be able to stick with something until you solve it. But yeah, it definitely attracted me to computer science.

It should be noted that due to the contexts where the study was advertised, there is a high number of students from computer science and information technology, in total of ten of the fifteen.

4.3.6 Negative influences

4.3.6.1 Excessive gaming

The issue of excessive gaming was the most commonly mentioned negative aspect of gaming; however it must be taken into account that it was also the only negative aspect that had an interview question to tackle it directly. Participants were divided in three groups, the first declared that excessive gaming was not a problem, the second declared that it was a minor problem, and the third considered that it was a significant problem in their lives.

- In the case of Billy, Jack, Hannah and Kurt, excessive gaming was not seen as a problem. Billy, Hannah and Kurt said that they always had the discipline to play for many hours and also perform his duties; in the specific case of Hannah, she said: “I was really controlled and when I had to I uninstalled the game. (...) I removed from my computer because I had to study”, hence avoiding any harm. Kurt just pondered about the possibilities of doing something more productive instead of playing games:

[gaming] is a good way of relaxing, taking your mind off things, and just good way to spend free time, obviously that is probably better ways I could have spent my free time. Playing football, or playing exercise, or something like that. Something that is more beneficial to me, or healthier. Or socialising. Something more useful, something more productive. Whilst I am having fun, I am not really accomplishing very much.

- Ander, Carl, Edward, Gary, Hannah, Marc, and Peter seemed to consider excessive gaming a small problem. To Ander, Carl, Edward, and Peter, it seemed to cause some harm only in some specific moments in their lives, as is illustrated by Peter: “I am sure there were times when I should probably shut off my computer and done something else, but not that bad so far”. Marc and Edward also considered that the limited problem that gaming occasionally caused was not due to games themselves, as if not gaming they would probably be distracted with something else. It is illustrated by Marc:

If you are going to be studying for a while then you could... you'd always find a way to not study. So what I think is that if I don't play the game I would probably be doing something else anyway.

- Donald, Ian, Lewis, Nash and Oswald considered that at some point in their lives excessive gaming was more of a problem. Nash described that sometimes thinking about games would make him distracted during the classes. But one of the most negative descriptions was given by Ian and Lewis. Ian described how playing games made him disconnected to reality:

I did have a bad phase, when I used to play too much of it. Because I used to, like, stay up for late nights just playing games, and then wake up early in the morning, go to school, come back again, and just enjoy playing games. In that sense, for that period I think so... You get disconnected from the outside world as well when you are too into a game. You don't have like a social life and you get completely disconnected. That is a bad aspect. But for me, not that much. (...) It happened for a moment, but it didn't continue for longer.

And Lewis described a result of his excessive gaming:

When I was like... 8 or 9 [years old]. I used to go to bed, my mom and parents would put me to sleep downstairs and I'd play until 2, then go to bed, then get up about 6, and play again. Until like school and all that. That's when I really played. Which

didn't work, I eventually crashed and just kind of felt unconscious one time.

Lewis also described that at some point he had to develop strategies to help him to deal with the excessive gaming:

Exam time came and I was like I had no idea, in my first exam I realised I've got to keep proper time management so I started setting alarms, like, after some time along to remind me to stop playing the game and get back to study and stuff like that.

Three participants commented on physical problems that theoretically players might develop if they play excessively. Marc, Ian and Gary mentioned eye problems; Gary also mentioned bad posture. However, according to them, they did not suffer any of these influences themselves.

In summary, the perception of the impact of excessive gaming ranged from its denial up to the description of significant problems caused by excessive gaming. Obviously, as in other sections, these are only the perceptions that participants shared; and this particular topic has the potential to be a difficult one to participants to admit that there are problems.

4.3.6.2 Negative learning

This section employs a wide understanding of learning, to consider the GIIL categories of general knowledge, emotional development and personal learning in cases the learning could be considered negative: for example, learning false knowledge, or changing how players feel or perceive things in a way that probably would not be desired.

- Ander, Hannah, Jack, Kurt, Marc and Peter said that gaming did not have any negative influence on them, and did not describe anything that could be interpreted in this way. Ander mentioned the belief that it can occur to others, but it did not to him: "I think that yes of course, video games can change beliefs and attitudes, but it did not happen to me". Peter shared a belief that games can only change attitudes and/or beliefs if they were designed to do it:

Unless a game is really trying to do it, it is not going to be doing it, otherwise... I mean, if a game is going [to change] what you think, is probably going to set out that it's trying to do that in the first place.

- Carl, Donald and Gary considered that gaming can have changed their beliefs or attitudes, but to a limited extent. Donald said that gaming can only spark some ideas, but not change completely someone's belief. Gary accepted the possibility too, declaring: "perhaps it has changes my attitudes a little bit, but definitely not my beliefs". And Carl said that because players know that games are fictional, they have no influence on the players:

I think it can influence your attitudes, but I don't think it can even change it, really. I have always thought my views and beliefs are my own, really. I don't feel like I have even been changed by anything. (...) Because in the internet and television there is content that is actually real. But with games, usually is fiction. Most of the time. I think that hasn't an effect on you. If you know that nothing is real, and it is all artificial and manufactured, I think it is hard to be impacted by it, really. In that sense. Of changing your beliefs.

- Billy and Edward said that probably games have influenced them in ways they are not aware. Billy said "I know that they probably shifted my attitudes in through my life but I am not aware of them", while Edward said that "there is probably some effect. Not sure how much. But obviously... subconsciously. (...) I can't think in any occasion, but it must have changed something".
- In the case of Lewis and Ian, they believed that something found in games was real, and found out later that it was not. In the case of Ian, he described trying out the football movements he had seen in football games, finding out that in real football they work differently from the game. Lewis said that when he was very young he believed in dragons, magic and that people could have super powers.

- Nash and Oswald described learning that would fit in the emotional development category, in a negative sense. Oswald described how he tried to copy the behaviour of a game character, having negative results:

I tried different things that happen in video games and maybe some of them turn out not really the same. Especially with a relationship with a person. So, he [game character] can talk arrogantly in video games and everybody likes him. Like, he is so cool, he is so awesome. And when I talk arrogantly in real life, everybody think I am stupid or something like that. (...) he can talk arrogantly and everybody think he is so cool. When I talk arrogant, everybody think that I am cocky guy.

Nash mentioned his fear of monsters:

Since I was very young I was very scared of monsters... I played horror games, I regret all the time, I shouldn't play that game. Since then I had fear every night. As a monster was coming for me, so... I... kind of... I don't know how to say... I am still afraid of that monster right now.

He also mentioned that a game influenced the appearance he appreciates in a woman.

In the game there is a very romantic love between two young people, and I was very moved. It melted my heart. And since then I... the kind of girl I am into, became the female character in the game. I changed the way the girl I like, the style.

In this particular case it is not clear whether Nash considered this influence to be negative; but considering the frequent unrealistic representation of women in games, it is arguable that shaping desire according to them is not positive.

- Although no participant commented about increase of aggression in their own cases, three of them commented about the topic. Edward and Gary denied this possibility, the former said, jocosely, that gaming “hasn’t turned me into a murderer”, and the latter said: “I know there are people that think playing violent videogames will make you violent.

I think it is a completely rubbish". Jack, however, shared his belief that violent games encouraged bullies in his school. Although he also plays violent games, he said it only affected other players:

Especially games where you have a lot of, like Street Fighter games, so sometimes when you play such games they teach a lot of violence, like kicking, hitting, boxing, slapping, so some people student in school learned violence from the games. And then they do it in schools. (...) It generates a lot of bullies. People start bullying other people by hitting them. Kicking them. (...) It does not apply to me. That is what I used to see in school. They were a lot of bullies, and... I believe one of the reasons might be there, they used to play violent games. (...) For me, no [bad influences].

To summarise, some students shared experiences of being influenced negatively by gaming, but they seemed to be, in general, of minor relevance to them. And although a few considered about the possibility of existing influences that they are not aware, more would consider that it simply did not happen or only occurred for others.

4.3.7 Interaction with others

4.3.7.1 Friends

When participants were asked about the kinds of conversations they would engage with friends, the main aspects mentioned by them were:

- To talk about strategies regarding game play, mentioned by nine participants: Ander, Billy, Hannah, Ian, Jack, Marc, Nash, Oswald, and Peter.
- To evaluate game characteristics, mentioned by nine participants: Billy, Carl, Gary, Hannah, Ian, Kurt, Lewis, Nash, Peter.
- To exchange game recommendations, also mentioned by nine participants: Billy, Carl, Donald, Edward, Ian, Jack, Lewis, Oswald, and Peter.

- To share or be reminded of previous gaming episodes; mentioned by eight participants: Ander, Donald, Edward, Gary, Hannah, Marc, Oswald, and Peter.
- To make plans about games to play in the future; mentioned by Carl and Nash.

The list is not exhaustive, but it reveals that the ideas that first emerged when asked about conversations with friends were fairly homogeneous. The influences of gaming were not mentioned.

4.3.7.2 Family

With regard to interactions with parents and other adults, there was some diversity of experiences:

- Some parents would actively take a stance against video games. Like in the case of Hannah, Nash and Oswald. In the case of Nash, video games were forbidden, and he used to hide to play. In the case of Oswald, his parents would limit his playing time, and the fact he wanted to work with video games made him argue. He said:

Sometimes there were fights. (...) I tried to persuade them that I am going to this track. So I may go to some video game company in the future, and the benefits in there, so when I were young, I talked about video games with my parents very little

- Some parents simply had no interest in games. Jack and Edward reported it, illustrated by what the latter said: "Mom and dad weren't interested. Nor would teachers be interested, would they?" In the case of Ian and Kurt, who both described the role of their parents as buyers of games. The latter said: "Only if I was asking them to buy me a game. It would be the only time I'd mention it". In the case of Ian and Peter, their parents were perceived also as buyers, but Peter's parents decided to buy educational games for him, while Ian's father would also participated in limiting his game time, sometimes hiding the video game until he had finished his homework. Ian said, about it: "So I had a

motive to go through it [homework] as well, so I could finish my studies and then have it [the game] back. So I did”.

- Some parents were perceived to have had limited participation in their children’s game practices. Ander’s father would patiently listen to him talking about his gaming experiences. Billy’s parents would occasionally ask him about what he was playing. The fathers of Gary and Marc like games, and they used to play with them, and about the conversations about games the latter said: “I used to play with my dad when I was younger. (...) But I don’t think we really... I can’t remember if we spoke about it a lot and stuff afterwards”. In the case of Carl, his father did not seem to be interested in games, but he would play with him in order to spend some time with Carl. He said: “I think he [my dad] was doing it more to have something to do with me. Because I was never one of the type that wanted to go and play football or whatever”.
- In the case of Donald, his mother used to play with him, and bought him an educational game that he did not like. He also said that although his parents allowed him to play violent games, they made clear that it was fictional violence. He described as follows:

As long as you are taught that shooting people is wrong, which my parents did, like, as long as there is someone saying ‘you don’t do it in real life, it is just a game’ kind of thing, it is not going to, like, affect you and anything else, really, is it?

- Finally, the most involved parent was Lewis’ father. He used to like games, participated in his gaming practice as a censor and also encouraging him to play differently. It is described in the two following quotes:

Because my dad has always been into playing games and most of his friends has been into playing games and he always took an interest in, like, when I was playing making sure I wasn’t playing anything that was like not proper to someone of my age.

I'd say it was about [when I was] 7 or 8. My dad got me to think logically about Curse of the Monkey Island, and I know I didn't play any game like this before, I played like a few simple games, like, just running. Platform games, like Mario, running and jumping, not much thinking about it, just like, judging distances, basically. And then I got into this game, like, got frustrated, I wanted to go and cheat, my dad disabled the internet so I couldn't look out for the walkthroughs, so I had to think about it and do it myself and then I started to think about real life problems (...) it helped me think on problems on a different sense, a more logical sense, then... instead, he advised me to take my time and think about what combining two items would do, and not just trying to click on everything else, to see if it actually do anything. I don't kind of try and do everything and see what of it, what the best result is, I just take my time, think about what I got, and think how I can make it work together.

There was another quote by Lewis that illustrates a different aspect of the relationship with his parents: when he had to reflect about the positive influences of gaming in order to justify his gaming practice to his parents:

If I could explain to my parents how this [gaming] was helping me to learn, and if I could actually understand it, without making up excuses, to find how to do it, then they would probably be more appreciative of me actually playing these games, if I was understanding what I was actually doing at school, and if it helps me reinforce my understanding, they wouldn't be that annoyed that I was not doing proper work. Because it was actually encouraging me to learn more.

To summarise, with the exception of Lewis' father, who seemed to influence Lewis' gaming in a few ways, most parents were felt to have had very limited interaction with their children with regard to gaming.

4.3.7.3 Online communities and resources

When asked about online communities and the Internet, most participants declared they use it to solve game problems and to find out about strategies. However, there were a few different ways to engage with online resources. The list below shows the responses that emerged from the questions.

- Ten participants described to use the Internet to find game strategies and solutions, or to know about game news (Ander, Donald, Gary, Ian, Jack, Kurt, Marc, Nash, Oswald, and Peter).
- Three described actively participating in discussion forums: Billy, Carl, and Edward.
- Three described disliking online communities due to their unfriendly aspect. Nash said: “there is a lot of bad people [in online communities], you know, rubbish. I really don’t want to talk to these people”, Lewis commented that “the anonymity of the internet kind of makes people very childish and immature”, and Gary declared: “I don’t care much for the online communities. Generally. It is full of really stupid people (...) I find them to be elitist”.
- Hannah said that she normally does not access the internet for game purposes; she gets all the information she needs with friends.
- Donald, in addition to search for solutions and strategies in the internet, described a resource that he frequently accesses and that supports reflection about games. It is illustrated below:

I watch this, like, guy, who does like a bi weekly video [probably referring to The Game Theorists] On YouTube. And the guy just takes like a game and then like analyses, does away too much analysing in the game, it is like, last week he did Final Fantasy and then he basically said ‘hey look, this game is anti-religious’ because in the Final Fantasy game a lot of ways the religious symbols are used, are to be against religion. [...] So I would say, in terms of myself, I haven’t. But in terms... but people who have then analysed games can find stuff from that. So, like, for me, specifically, I haven’t [learned/reflected about

games], other than these videos I watch but I am not actually derived directly from the game by playing it.

In summary, Donald was the only participant who reported using the internet in a way which explicitly does not fit into an instrumental support of gaming practices (e.g. accessing game walkthroughs) nor had a clear socialising element (e.g. playing with friends). Arguably, what he described could be called a more reflective way.

4.3.8 Games and schools

The questions concerning connections between games and schools were divided in three sections: the use of educational games as pedagogical tools by teachers; the cognitive connection between the two made by participants; and alternative ways in which gaming “colonises” the school environment (e.g. when students decide to draw game characters in art classes).

4.3.8.1 Educational games in schools

The experiences shared by the participants regarding educational games in schools were very limited. Only three participants had any experience to share. Billy and Gary were sceptical about the learning effectiveness of the games, and although Billy described an engaging experience, Gary said that students would shift to regular games when the teacher was not looking.

Peter was the only participant who had positive experiences with educational games to share. He mentioned a few different games and despite having criticism to some of them, he also praised some of his experiences. About it, he said: “it was like ‘do this, it’s fun, by the way, you may be learning something’ (...) I suppose it’s the ideal way, isn’t? If they don’t realise they are learning”.

4.3.8.2 Cognitive connections between games and schools

The idea that students can associate game themes with content taught in schools – here called *connections* – was one of the emphases of this study. Similar to other themes, there was a range of participant perceptions with this regard.

- Three participants did not remember any connection of that sort (Marc, Peter, and Carl). This is illustrated by Peter's quote: "the games I play aren't really grounded in reality, see, so, not much you can take out of the context". It is noteworthy that earlier he had defined Portal 2 (Valve Corporation, 2011) as one of his three favourite games, and Portal 2 is sometimes associated with physics concepts, which other participants mentioned. Similarly, Carl had Civilization 5 (2K Games, 2010), which is sometimes associated with history and geography learning, amongst his favourite games, and expressed a similar opinion when asked about the connections: "No, definitely not. No. I wouldn't say so. They are all just for pure entertainment. Nothing to do with anything, really".
- Nine participants described some connections, but they were considered unimportant events in their school life and game practice. They were Ander, Billy, Donald, Edward, Gary, Hannah, Ian, Jack, and Oswald. Gary illustrates it well: he mentioned World War games and history lessons, and some puzzles in games would have relation to physics lessons. But the relevance of these was described as:

It would probably be like a 'wow that was interesting. I know that already because of this video game' or 'that was cool because I did that last night in this video game' then like, a peak of interest, and then fade out, like school generally does.

Some of the examples of such apparently unimportant connections were: Command & Conquer: Red Alert (Virgin Interactive, 1996) reminded Hannah of her lessons about the Cold War; or Ian and Edward, who in geography lessons remembered games that depicted the world map.

- To Kurt, Nash and Lewis these connections seemed more relevant: Kurt described associating war games with history classes, which would make him more motivated to play the game and raise his interest in the topic. He considered that his gaming practice was affected by his school experiences, and not the opposite, as he said: "All my learning

experiences affected my gaming, but my gaming didn't really affect my learning experiences". And he gave more detail about it:

When you first start to play the game, I just like played them. I didn't really pay a great deal of attention to the story. But when I began to learn more about it, and I started to play the game which was about it, I started to think more about it. It just helped my interest in the topic. (...) If I was playing the game, I would only be thinking about that sort of topic while I was at school. Or in the classes, or doing homework. But then, by playing the game as well helped me think about it more often.

The connections remembered by Lewis were history of Roman Empire, Greek mythology and history, French, properties of Helium, concepts of Physics. He described that the connections would motivate him to play the games again, and sometimes they would make the gaming experience more enjoyable, and sometimes easier. To him, the connections would also help his school experiences, for example:

I would know the answer before the teacher would actually ask, like 'does anyone know who the most famous of the Spartans was?' and I'd know the answer to that, and also like, mainly history, to be honest, because a lot of games are set back in the day.

Nash perceived the connections because through games he would learn English, Chinese, history, and about the world map. He shared situations that he would know answers to teacher's questions due to his gaming practice. To him apparently there was a synergic learning relationship between games and school, which would complement each other:

I think the content [from games] is totally different [from school]. [In games] I can see another side of war, and I never know, so, I want to explore more. I want to see more. And probably I will go back to school and check that, if that is true or something. Because the school is not always correct, but it is the truth, mostly. So I will go back to school and learn it, and then go back to play games and learn more (...) I play more

games, I learn something. But I am not sure if that is true or not, so I go back to school and learn it. Maybe it is not covered by the lectures, but I will find something in the library.

In summary, for the participants although gaming experiences often reminded them of content from school and *vice versa*, only in the case of three participants were these connections perceived as important, either to their gaming experience, their school experience, or both. Also, a few students perceived no connections whatsoever, even if two of them described two favourite games that have been described as presenting strong analogies with school subject.

4.3.8.3 Games “colonising” schools

There were other possibilities of intersection between games and school despite pedagogical uses of educational games and cognitive associations of subject matter. The ones related to excessive gaming were already described separately, but in addition to that:

- Kurt, Peter, Lewis and Nash perceived no overlaps besides the ones described in previous section.
- Six participants responded that the intersection between gaming and schools were their friends, sometimes describing that gaming would help them to socialise and to create bonds. Ander, Billy, Carl, Donald, Marc, and Oswald said that.
- Hannah, Carl and Edward used to play in whose school’s computer lab, even though it was forbidden in the case of the Edward.
- Ian participated in a game club in his school, where he used to play Counter Strike (a modified version of Half Life, Sierra Studios, 1999).
- Billy would have diaries as writing activities, and he would frequently choose to write about some of the games he had played.
- Gary would frequently draw or paint video game characters in art sessions.
- Jack believes that violent games encouraged bullies in his school.

Based on this collection of experiences, it seems that occasionally gaming finds its spaces in the school environment, in a variety of ways.

4.3.9 External sources

Participants were asked about the experience of feeling inspired to employ external sources (e.g internet) to learn about a game topic, which is also referred as tangential learning. To learn about the game *per se* was already addressed in the question about use of online resources, so this section refers to topics that are not gameplay. Participants shared a range of experiences, from declaring that this activity was not performed at all to opinions that consider this practice common and important. They are divided according to the answers they gave to the frequency scale.

- Ander, Ian, Marc and Peter declared they have never done this.
- Billy, Carl, Donald and Hannah declared they do this occasionally, and did not demonstrate particular enthusiasm with the idea. From the examples given historical topics were mentioned by Billy, Hannah and Edward. Hannah also mentioned searching for game soundtracks and films, and Carl declared that he read novels, one that inspired the game *The Witcher* (Atari, 2007), and other that was inspired by the game *Mass Effect* (Microsoft Game Studios, 2007).
- Edward, Gary, and Jack said they do it frequently. They all mentioned the example of searching for historical topics in *Assassin's Creed* (Ubisoft, 2007). Gary also mentioned the historical topics of *Call of Duty* (Activision, 2003), and said:

Assassin's Creed being an example. The things I found out about the crusades I thought "it is quite interesting", and then you go to Wikipedia and read an article about it. So I would say yes. Generally... I mean, games like Starcraft that you know that it is not real, you can't find in Wikipedia. So it is not very useful. But some games like... I guess most of the games that are offered give real life events.

- Kurt, Lewis, Nash and Oswald declared they do this very frequently. Some examples were associated with history: Kurt mentioned

Assassin's Creed (Ubisoft, 2007) and Call of Duty (Activision, 2003), and Nash mentioned Civilization (Micropose, 1991). Others examples were from mythology: Nash mentioned Diablo (Blizzard, 1996) and Lewis also mentioned mythological topics. Finally, Kurt mentioned cultural elements (Batman) and Oswald mentioned the soundtracks and technologies employed by games. The two following quotes illustrate their enthusiasm with that practice, the first of Kurt and then Nash:

Especially all games that are set in the past. So, like, Assassin's Creed, which is set, like, in 13th century, after I finished playing that, I get reading upon... basically, 13th, middle east stuff. Just like... I suppose, if I get interested in the game, that sort of mean I got interested with what is happening in the game, in that sort of time period.

When I play a game, something I don't understand, or I think I don't know that is true or not, I will check it. Because it's something that I completely don't know. I definitely have to check it. But I am not sure if that is right, so I go check.

Nash: So when I played the game I even think 'oh yeah this part is right, but that part I don't know' then I go to the internet and checked. It is kind of learn and relearn.

In summary, amongst the participants there was a range of levels of involvement with the practice, and historical themes emerged more than other potential topics. In addition to examples from traditional curricular topics, there were cases in which participants had searched for cultural references (e.g. the soundtrack used, the universe of Batman, novels related to the game) and technology (i.e. the engine used).

4.4 Discussion

The findings described in detail participants' perspectives with regard to the influences of gaming, and also to many aspects that are related to those influences, namely: design practices, use of external sources, supportive forms

of social interaction, and connections with schools. These perspectives of participants answer the main research question associated with this study, as well as the three specific research questions:

- What do players do with games?

Despite the high number of playing hours of participants, the study found that only a minority of players had significant design experiences with games and actively engage in online communities, which was expected (Iacovides et al., 2012).

- What do players believe about the influences of their gaming?

The findings suggested that only Nash and Lewis take the influences of gaming into account in their gaming practices. However, when asked about it, most participants were able to mention at least one potential influence. It was expected, as many studies about influences of gaming found that many ideas emerge when players are asked (Olson, Kutner, and Warner, 2008; Kutner et al., 2008; Iacovides et al., 2014; Gose and Menchaca, 2014; Cruz, Ramos and Albuquerque, 2012; Turkay and Adinolf, 2012). However, those studies describe the perspectives of players in a fairly homogeneous description. Contrastingly, the current study adds to that literature by highlighting the contrasts amongst players: whereas a few participants, such as Billy, Lewis and Nash, described many influences and considered them very relevant to their lives, others described almost nothing, such as Ander, Ian, and Marc. Moreover, especially amongst the participants who were between these two extremes, there was a heterogeneity regarding the kinds of influences. In most topics addressed, only a few participants would have any significant experience to share, revealing sets of experiences that differed greatly from each other. Three examples that differ greatly that illustrate this are: the only significant experiences of Carl were his practice of ethical reasoning and his encouragement to read a few novels; in the case of Hannah, she declared to learn about cars, English, music, and developed her self-confidence; to Donald, games helped him to develop problem solving skills and to find refuge in difficult times of his life, whereas he also struggled with excessive gaming in

some moments. In other words, the findings suggested that the perspectives about the influences of gaming are very heterogeneous, with great individual differences.

- What are players' practices around games?

Amongst the practices investigated, namely interaction with others, external sources, and connections to school, some showed to be more significant, and others, less. In the case of interaction with others, no evidence was found about friends encouraging reflection about the influences of gaming, and most parents seemed to be mostly absent in the gaming practices of their children, and apparently only Lewis' father seemed to take the influences of gaming into consideration. There was only one case that suggested that the internet can encourage deeper reflections about games: the case of Donald and the YouTube channel he frequently watches. It should be noted that not talking about the influences of gaming does not mean that those interactions are not promoting the influences. In the descriptions of online interactions in games given by Steinkuehler and Duncan (2008) or MacCallum-Stewart (2011), there is not reference to spontaneous talking about learning. Apparently, there is just learning.

With regard to external sources or tangential learning, it was one of the few topics addressed that most participants could relate, and in many cases participants were able to give concrete examples of previous learning through tangential learning, which suggests that perhaps the topic of tangential learning is important enough to the gaming practices of players, justifying further research about it. Although a few authors do take tangential learning into account (Iacovides et al., 2014; Turkay and Adinolf, 2012; Whitton, 2014), there is very little research aiming to deepen our understanding of this phenomenon.

In the case of connections between games and schools, despite the importance given to it in the interview questions, those connections seemed to be of minor relevance to participants. It did appear to occur to many students, and was particularly important in a few cases such as Nash; which can inspire further

research about this apparently rich possibility. However, in general it seemed to be a topic of minor or no relevance to most participants.

The findings describe players' perspective, hence answering the research questions. However, the main research question also addressed how their perspectives inform the design of the intervention. It was important to get familiarised to the players' discourse, e.g. find out which topics seem to be of more or less relevance, and this guided the selection of topics for the course, as well as the approach to them. Furthermore, there are two aspects that may be highlighted with this regard: One of them is the *absence* of the influences of gaming as a relevant topic in the participants' perspectives. This was apparent in most of the issues addressed:

- Although practically all participants were at least slightly familiar with design practices, very few described those practices as relevant parts of their gaming practices. This finding suggests that there might be a distance between game education proposals based on game creation (e.g. Buckingham and Burn, 2007) and the actual gaming practices of most students. In other words, if students are asked to create games, they might perceive this activity as very different from what they actually do with games at home.
- Their reflections about games suggest that the influences of gaming play a limited role in their decision-making, and in how they understand the role of gaming in their lives beyond the value of games for fun and relaxation.
- There is a diversity of learning that participants described, both in the skills and personal spheres. This suggests that although those elements might play a small role in how participants understand gaming, when asked about it many claims – which are also found in the academic literature – emerge. However, a clear diversity was noticeable: a few participants described a variety of meaningful learning outcomes, whereas others essentially disregarded those possibilities.
- Amongst the negative influences of games, excessive gaming was the most relevant issue for the participants, which permeates their decision

regarding games and how they understand gaming in their lives – similar to the findings of Kutner and colleagues (2008). However, other negative influences, such as aggression and stereotypes, had only limited presence in their discourse, which reflects the scepticism about its relevance found by other players surveyed in the literature (Brenick et al., 2007; Rodríguez-Hoyos and Albuquerque, 2015; Olson, Kutner, and Warner, 2008). Billy and Edward, however, were aware that they might have been influenced in ways they are not aware.

- The interactions participants described with peers and parents also echoed the absence of the influences of gaming, as in most of these interactions thoughts about the influences of gaming were rare. The most common context that the influences of gaming were observed was in the family environment, a few parents would take a stance against games or limit gaming time. However, there were only rare parental interactions around other influences of gaming.
- There were few connections between games and schools that were perceived as relevant by the participants. The findings also showed games such as Civilization 5 (2K Games, 2010) and Portal 2 (Valve Corporation, 2011), which were also used as pedagogical tools – see description in Squire (2006) and Salen (2012), respectively – were not perceived as related to school subjects by a few participants even though they played them. This illustrates how players can engage in their gaming practice in a straightforward manner, challenging more optimistic views that seem to consider that “these connective questions come naturally” (Squire, 2011, p. 20).
- The use of external sources seemed to be the most widespread and significant positive influence of gaming discussed by participants, so this theme was not as absent from their discourse as most of the others.

The second aspect was the presence of a few cases where participants seemed to make a positive use of their gaming experiences in terms of the influences of gaming. A few participants clearly reflect about the influences that playing games have in their lives, actively searching for connections between gaming and other spheres of life, such as (i) formal learning, (ii) informal learning, (iii)

problem solving, and (iv) relationships with others, which probably was most clearly illustrated by Lewis and Nash. Obviously many statements could be considered a little naïve – even though it is difficult to pin down exactly which descriptions were not realistic without access to further information, i.e. perhaps Billy indeed learnt more history from gaming than from history lessons. However, there were critical accounts too, for instance the five participants who pondered about the usefulness of the general knowledge they acquired, or when Billy and Edward considered the possibilities of their attitudes and beliefs having been influenced despite their awareness of it.

There was a combination of two aspects in the findings: (i) the absence of the influences of gaming reported in participants' discourse (and occasional naivety) and (ii) the presence of few critical accounts and approaches that actively take the influences of gaming into account in the way they engage with games. This combination is encouraging for my game education proposal. The limited presence of the influences of gaming in players' discourse suggests opportunities to learn and reflect: a void that can be filled. It also suggests that although in most cases the influences of gaming play a secondary role in how gaming is understood and carried out, the possibility of actively seek to take advantage of the influences of gaming is possible. Moreover, a few players seem to be already taking advantage, suggesting that this form of game engagement is a realistic possibility. Furthermore, despite the lack of formal game education processes including the influences of gaming, in rare cases game education is occurring spontaneously and apparently generating results, as in the case of Lewis' father and his encouragement to develop a critical play in his child, or the videos accessed by Donald, which stimulated his reflections about deeper meanings of what is represented in games, as well as the case of Nash, who apparently began to take the influences of gaming in consideration with no external encouragement to do so.

To conclude: in addition to the detailed description of players' perspectives, the study generated an optimistic message for the thesis: that there was fertile ground to plant the seed of the current game education proposal.

5. GAME EDUCATION MODEL AND COURSE DESIGN

5.1 Introduction

This chapter describes the game education model that was developed based on the literature and on Study 1, and the course that was designed in accordance with that game education model. This chapter can be seen as the result of reflections resulting from the second research question:

- RQ2: How can reflective gaming be taught?

These reflections can be divided in two parts and their correspondent specific research questions. The first part related to the question:

- RQ2.1: What are the important aspects of a game education proposal?

Its answer is a model of game education that focuses on the influences of gaming and also responds to the other gaps perceived in the literature and in the perspectives of players found in Study 1. This model is outlined in the first part of this chapter, and was named the ICEED (*Informative, Critical, Empowering, Emancipatory, Dialogical*) game education model. Clearly, the development of this proposal involved a judgement regarding *what* and *how* is more worth educating about games. Certainly other authors would judge differently and they indeed have done. Therefore to be an important characteristic, in the context of this research question, is to be important according to my judgement, based on the theoretical background, comparative study of other game education models, and Study 1.

The second part is the natural development of this line of reasoning, in which the conceptual model is operationalised as a course, the Reflective Gaming Course (RGC), which was empirically investigated later in Study 2 and Study 3. Therefore the second part of this chapter answers the research question:

- RQ2.2: How can a specific course implement these characteristics?

The two research questions addressed in this chapter allow for a multiplicity of answers. Thus, the answers provided in this thesis are not definitive and do not

exclude other possible answers. They provide one solution to the questions raised in this thesis, in other words, one alternative amongst others. Naturally, other researchers departing from the same initial premises could design different solutions, and so future versions (including my own future versions) could be compared to my current one, as well as mixed, and/or be mutually insightful.

5.2 The ICEED game education model

This section describes a model of game education that responds to the gaps perceived in the literature, using Study 1 to bring players' perspectives to the model. The game education model will be outlined through five main principles: (i) Informative, (ii) Critical, (iii) Empowering, (iv) Emancipatory, and (v) Dialogical. Later it will be referred to as ICEED model.

It should be noted that the words chosen to represent the main characteristics of the model (i.e. informative, critical, empowering, emancipatory, dialogical) have many and strong connotations. With the exceptions of informative, they can be easily tracked to the critical pedagogues from my theoretical background, such as Freire (1970/2005) and Kincheloe (2008). However, these words are polysemic, and in the context of this thesis they are used to describe five specific aspects of the model. The use of those terms can be contrasted to the contexts of critical educationists, who are often more concerned with possibilities of emancipation and social change in a wider sense in the learners' life. Consequently, the adaptation of those terms to players' gaming practices is a conceptual transposition that, arguably, maintains the basic principle but becomes apparently less socially relevant. For example, if emancipatory game education suggests that learners' autonomy to choose how to play should be preserved, in a more classical understanding of emancipatory education it would refer to wider democratic participation of citizens and so forth. Clearly, this conceptual transposition to gaming is limited, and should be recognised. Hence it is important to alert the reader that in this thesis the meanings associated with each of these terms will be the ones described here and were solely *inspired* by critical educationists. In other writings the terms embrace more complex and multifaceted interpretations.

The principle described in the term *Informative* refers to the content of the course. And in this model, the content is defined as the influences of gaming on players. Therefore the informative principle describes the main aspect of the proposal, which is the placement of the influences of gaming in the centre of the model, i.e. perceiving gaming as a practice that potentially influences beyond gaming. The decision of including the influences of gaming is inspired by the way that the academic literature offers a body of knowledge and claims about their potential.

However, the overlap between that body of knowledge and game education proposals has been tentative. Apparently, knowledge about the influences of gaming should be a concern of policy makers, parents (e.g. Aglieri and Tosone, 2012; Steinkuehler, 2015; Weis and Cerankosky, 2010) or clinicians (e.g. Brooks et al., 2015; Unsworth and Ward, 2001), but the possibilities of *players* themselves learning about the influences of gaming is rarely the focus on the proposal. When it is, the focus often gains a protective aspect (e.g. Klimmt, 2009; Chuang and Tsai, 2015). Both the paternalistic placement of the concern about the influences of gaming solely to other (parents, clinicians, policy makers) or the protective approaches are challenged by critical pedagogues and media educationists: the former for valuing the autonomy, empowerment and capacity to actively think and act in the world (Freire, 1970/2005) and the latter for considering that critical engagement with media is a key skill for contemporary citizenship (Buckingham, 2003). There are some educational proposals in which the positive influences of gaming are considered learnable by players, but it normally becomes a brief detail within a larger framework of knowledge about games. (e.g. Fromme, 2012; Felini, 2012a, 2012b; Apperley and Beavis, 2014). In conclusion, the first principle of this proposal is that game education aims to inform learners about the influences of gaming.

The second principle, *Critical game education*, in this thesis refers to the intent of socially responsible education. It recognises that games are cultural objects integrated within systems of beliefs, ideologies and worldviews. In this research, being critical means to see through those biases of the media and

understand the impact they potentially have (Buckingham, 2003; Kellner and Share, 2005). In the case of games in particular, they can frequently manifest with racist, Eurocentric, patriarchal, sexist and hegemonic worldviews (Sanford and Madill, 2007), and a critical gaming education tackles these worldviews directly, uniting forces with other critically oriented educational initiatives that address the same wider societal issues.

The third principle of the model is to create an *Empowering* game education. This principle is based on the growing body of knowledge that suggests that gaming matters beyond the activity of gaming itself, and interprets the influences of gaming as differentiated depending on the context and choices taken by players. Therefore this perspective is non-fatalistic and non-deterministic. In other words, an empowering game education considers that the influences of gaming are not monolithic, because they depend on who, what, how, for how long, etc. (Gee, 2007; Steinkuehler, 2015) Therefore, players have some degree of power about the influences of gaming, if not more at least the choice to turn the game off, or play one game instead of another. Empowering gaming, in this context, means to reflect about the potential influences of gaming and act upon the gaming practice if the player so wishes. The educational perspective of Freire (1970/2005) reinforces the idea that education is a process associated with action; hence the significance of educating young people about a sphere of their lives that they can actually act upon. Therefore, learners have the choice to take action – i.e. change their gaming practices – potentially *influencing the influences of their own gaming*. It proposes a shift of perspective: from seeing games as an art form that is separated from life in a magic circle (Huizinga, 1949) to a perspective that considers gaming to be integrated with life (Pargman and Jakobsson, 2008; Stevens, Satwicz and McCarthy, 2008), and that the decisions about it can be more informed and reflective. According to this perspective, reflective gaming can be compared to other spheres of life that people are educated to be more reflective and informed about such as diet, physical activity, sexuality, internet use, aesthetic appreciation, energy saving, ethical consumption, etc. If gaming does matter and a growing body of literature suggests it does, we probably need to think about further processes of education that go beyond simplistic

heuristics such as the *no more than two hours of screen a day* rule (Steinkuehler, 2015) or the *cooperative gameplay overall has more benefits than competitive gameplay* one (McGonigal, 2011).

The fourth principle proposes an *Emancipatory* game education, which here refers to the approach to the content, and is opposed to a normative approach to game education. This principle considers that there is a variety of ways players engage with games, and game educationists should embrace this diversity of gaming practices. In other words, it is opposed to the idea that there is a way to engage with the games that is the *norm*, to which all forms of engagement with games – which are thus *abnormal* – should aspire. It also means to address the influences of gaming in a critical approach that is neither celebratory nor protective (Buckingham, 2007) – an approach that focuses on critical and reflective practices instead of a moralising one (Potter, 2004). Consequently, it does not deliver answers to learners; it informs and allows them to develop their perspectives (Freire, 1970/2005). It aims to liberate the perspectives regarding gaming from its stereotypes and stigmas through critical thinking (Aglieri and Tosone, 2012) instead of reinforcing misconceptions. In this way, it recognises the learners' partial ownership of the game affordances instead of forcing educators' norms upon play and consequently threatening its fundamental playful aspects (Buckingham and Scanlon, 2003; Fantin, 2010). In other words, an emancipatory game education avoids colonising learners' gaming worlds, allowing players to make use of the course as they wish.

The fifth principle refers to *Dialogical* gaming education, which in this thesis means that the educational practice maintains a “connection with what the child has already seen and felt and loved” (Dewey, 1902/2011, p. 31) instead of undertaking practices that are unrelated to learners' practices. Also, in practice, it aims to relate to the topic with examples of games the learners actually play, rather than proposing a *game canon* (Partington, 2010). The knowledge addressed is therefore a balance between an individual, experiential knowledge and the academic, formal one (Dewey, 1902/2011). Consequently, there is a recognition of learners' previous perspectives about the influences of gaming, which some studies outlined (Iacovides et al., 2014; Turkay and

Adinolf, 2012; Cruz, Ramos and Albuquerque, 2012; Gose and Menchaca, 2014). Game education can establish further dialogue between players' experiences and academic ideas, thus creating connective bridges between formal and informal learning (Sefton-Green, 2004). On the one hand, this connection with learners' experiences aims to make educational practice relevant, motivating and contextualised. On the other hand, it aims to place both home experiences and educational experiences in the same experiential continuum (Dewey, 1938), therefore encouraging projection of learning from educational contexts into concrete gaming practices.

A question that might emerge from this description of game education is the following: is the term *game literacy* used to describe the result of this *influential, critical, empowering, emancipatory, and dialogical gaming education*? The response to that in this thesis is that it is, and it is not! Clearly, it can be considered game literacy if this term is used to describe the outcome of a process of game education, analogous to media education (Buckingham, 2003). I have employed the term as such in previous writings before and throughout this thesis. However, the growing distance to the original creative aspect of written literacy suggests that perhaps the term literacy is not so appropriate for the ICEED model. Moreover, it seems incoherent and even unfair to consider that players – and in particular the intense players such as some participants of Study 1 – are *game illiterates*, despite their great familiarity with a range of games and with the game culture, just because they do not know or care about the influences of gaming. To suggest, even in the specific conceptual context of this thesis, that I am more game literate than my pupils and interviewees is a perspective that I would rather avoid. I am, however, happy to consider myself more educated about the influences of gaming than they are. In conclusion, I consider that game literacy could be used to describe the aim of this game education proposal if the necessary concessions are made, but to avoid further conceptual discussion about it and because of some incoherencies with it the term will not be used as a key element of the ICEED model. Instead, the term that will describe the gaming practice will be simply “reflective”, which in this thesis will be used to

summarise the characteristics suggested by an ICEED game education – as it was employed in the name of the Reflective Gaming Course.

These characteristics of the ICEED model can be applied to a variety of contexts. With the exception of the dialogical relation between formal and informal learning, which refers specifically to formal education, these principles could be employed in parental game education (e.g. Steinkuehler, 2015), game related media or game journalism (Zwieten, 2011) and others. This thesis will develop the idea and investigate it empirically in the context of schools, but these five principles could well be adapted to other contexts.

5.3 Reflective Gaming Course (RGC) design

The conceptual principles of game education were used to design a course to be offered in schools and research how the principles work in practice. The process of course design was also based on the ICEED model, on the findings of Study 1 and on the literature about the influences of gaming. My supervisors gave me invaluable feedback and suggestions. The course had to be short in order to avoid high dropout rates, which can be a serious problem particularly in extracurricular activities. It also had to cover the topics that were judged the most important. It should be clear that this proposal was designed to fit this research project and does not aspire to be the best solution in other game education contexts. Its final version can be considered – I hope – a useful basis for future applications.

There are some general characteristics of the pedagogical choices made during the design process, and they became recurring features of the course. These are described below.

Short videos (from a variety of authors, all freely available in YouTube) were employed to convey content. This decision had pedagogical and research rationales. Pedagogically, some of the videos deliver their messages clearly and quickly, using voice, visual appeal, and humour, in a manner that the researcher would find difficult to reproduce in live exposition. It was also expected that the variety of methods – combining live talks and videos – would create an engaging experience. With regard to the research, the videos were

also very convenient because they decreased the cognitive overload of the researcher, who had to simultaneously teach that specific course for the first time and observe it. Additionally, researchers or practitioners who want to offer similar courses in English in the future can employ the same videos, therefore allowing for a degree of replicability. It is also relevant because it decreases the level of knowledge domain that is required from the teacher, therefore creating more realistic conditions for success for future projects (Dede, 2004), i.e. less demands on teachers and/or researchers who want to offer similar courses in the future.

When possible, practical activities were offered, such as playing games and analysing them. Activities were designed to both create engaging experiences and allow learning in context. The role of playing games is particularly relevant, because in essence the skill taught in the course is the reflective gaming skill, and by playing games the learning becomes more authentic. In other words, learning occurs through cycles of experience and reflection (Kolb, 1984).

The decisions above were taken according to the context in which the course was offered, following the principles of the ICEED model and with my capacity to design a course with the support of my supervisors. Other practitioners would surely make different choices and I do not claim that mine were optimal. They were, however, coherent with my proposal and able to fulfil the needs of the research project.

In the next sections, each session of the course will be described in terms of its pedagogical aims, the rationale for its inclusion in the course, and the classroom activities. In the case of the time allocated for each activity, they were not meant to be strictly followed, but rather to clarify the emphasis of each activity in relation to the session.

5.3.1 Session 1: Tangential learning

Rationale: It was argued in the previous chapter that tangential learning (learning about game themes through external sources) has been under-researched in academia, and this little presence of academic literature offered a

challenge to the course design. On the one hand, Study 1 suggested that tangential learning is not only an experience shared by many players, but it also emerged as the most concrete perceived benefit of gaming; allowing participants to draw upon concrete examples and be confident about the actuality of the influence. On the other hand, the literature available did not offer much insight. To be coherent with my claim that this topic should receive more attention and that the previous experiences of learners should be taken into account in a course such as this, tangential learning was included in the programme. It also meant that it was the first game education proposal I know of to explicitly and emphatically cover tangential learning. This session was chosen to be the opening topic for three reasons: it was simple enough to allow time for an introduction in the first session; I wanted to open the course with a positive perspective of games in order make explicit the pro-games approach of the course (which did not prevent criticism occurring later in the course). Also, it seemed that approaching a topic that draws on concrete positive examples from learners would be icebreaking and engaging.

Lesson objectives: at the end of the session the student should: (i) understand the idea of tangential learning; (ii) know a wide range of possibilities of tangential learning; (iii) understand that different games employ different forms of cultural references and (iv) be able to relate these ideas to their individual gaming practices.

Planned activities:

5 minutes Introduction	
Activity	The course began with an introduction to the course, when the research aspect of it was explained, and the content of each session was briefly presented
10 minutes Tangential learning	
Activity	Students watched a video that explains what tangential learning

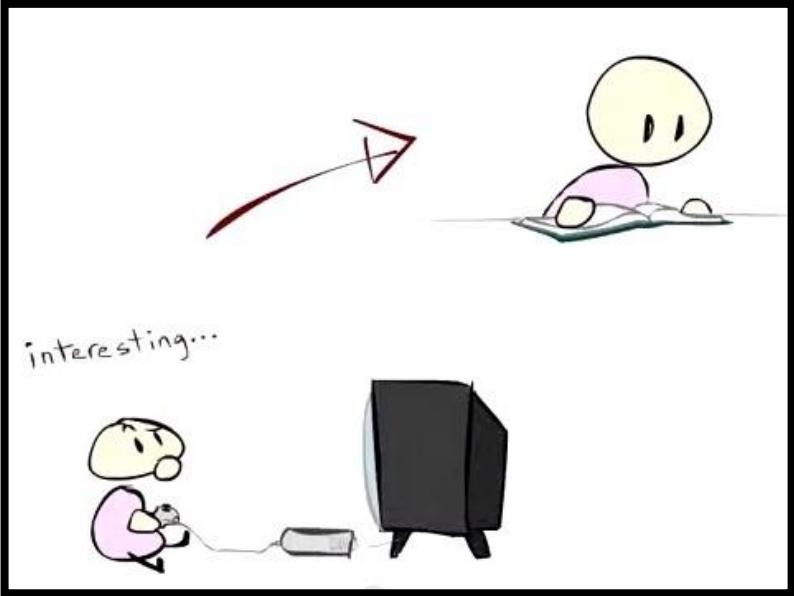
	<p>is. Before watching the video, students were given the question “What do you learn with games, if anything?” as a preparation for the video. Students were also asked to individually share their names and to share previous experiences of learning in general, if they wished.</p>
Resource	

Figure 1: Screenshot of the video “Video Games and Learning” (Portnow and Floyd, 2008)

The video “Video Games and Learning” (Portnow and Floyd, 2008) is an animated lecture of 7:20 minutes, but only the first 4:25 were used. The lecture argues that there is a big divide between games for entertainment and educational games, and goes on to propose that one way to make entertainment games more enriching is the practice of tangential learning, i.e. to be inspired by an element perceived in the game and search in external sources for more information about it, therefore learning actively and based on genuine motivation. The video presents the examples of people learning about Leonidas and the Battle of Thermopylae, Second World War II, Chinese History, Music History and Qabalah. The video uses humour and plenty of images.

10 minutes	Discussion
Activity	Students were asked to share their previous experiences with tangential learning. It was followed by a brief discussion led by the questions: “do you think the experience of gaming changes after tangential learning?”, and “What else can we search in games that wasn’t searched so far?” The latter aimed to generate plenty of ideas of elements that could be searched in the internet.
20 minutes	Tangential learning practice
Activity	Based on the previous generation of ideas, students were asked to choose a game element that they hadn’t searched before, and in pairs searched for information in the internet. After the activity students were asked to share their findings to the group.
5 minutes	Online survey about the session

5.3.2 Session 2: *Cognitive gains*

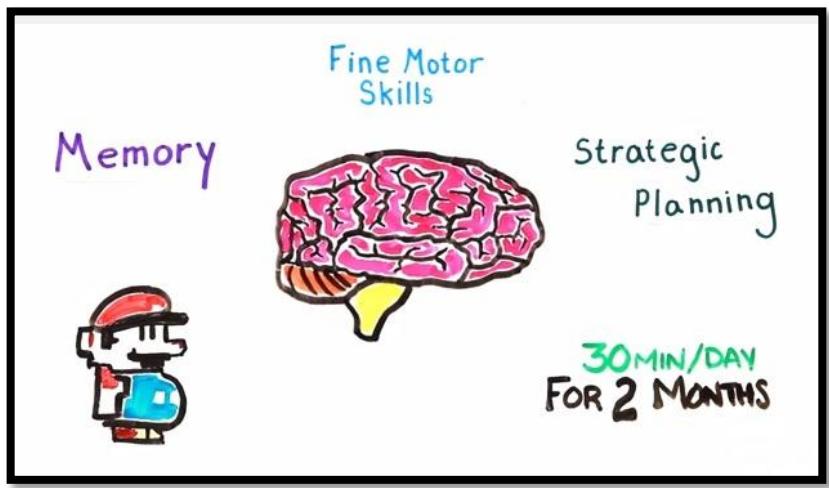
Rationale: this session covers different topics under the umbrella idea that “games are making people smarter”, which is present in media (e.g. Johnson, 2005), imagination of players (Iacovides et al., 2014; Turkay and Adinolf, 2012; Cruz, Ramos and Albuquerque, 2012; Gose and Menchaca, 2014) and academia (Greenfield, 2009; Bavelier et al., 2012). Because of the presence of this idea amongst the different parts involved, and the amount of published work in the area, it seemed an obvious topic to cover. Although some authors mention the *learning processes in games* as learnable topics (Apperley and Beavis, 2014; Fromme, 2012; Madill and Sanford, 2007), it rarely receives much attention or is addressed in detail. Felini (2012a) offers a description of game literate player who is aware of the mind operations involved in

gaming, but give little detail about how to develop what seems to be a highly complex competency, and the topic seems to be a detail amongst the wide range of game related topics he proposes to teach. According to my knowledge, the current proposal most emphasises this aspect of gaming in a game education course.

Pedagogical aims: at the end of the session the student should: (i) know some of the main claims in the research literature regarding improvement of cognitive processes and problem solving skills. (ii) Problematize the value of such claims regarding their usefulness and transferability. (iii) Be able to relate these ideas to their individual gaming practices.

Planned activities:

5 minutes Introduction	
Activity	Students were asked about comments from the previous session, and a brief comment about the topic the current session was done.
5 minutes Video	
Activity	Students watched a video that presents some of the claims about cognitive benefits of playing games. Before watching the video, students were given the question “What is the best game to make you smarter?” as a preparation for the video.

Resource	
5 minutes	Discussion
Activity	<p>Students were asked to repeat the benefits mentioned in the video, and expand with other similar benefits that they believe to be developed through gaming. A list with some extra claimed benefits was shown to them.</p>
25 minutes	Game play

Activity	Students were asked to play the games Portal: the Flash Game (We Create Stuff, 2007) and Auditorium (Cipher Prime, 2008) for ten minutes (for both games) and think about skills that are potentially being developed through play. Then they were asked to think about the skills that they might be developing when playing the games of the previous activity, and think about the non-gaming contexts that the developed skill could be used. They had to do the same with at least one of their favourite games. Finally, students were asked to share their thoughts, and reflect on whether players can take the development of these skills as for granted and/or useful.
2 minutes	Optional homework
Activity	It was suggested that students watch the video “Your brain on video games” (Bavelier, 2012) in case they wanted to know more about the topic.
5 minutes	Online survey about the session

5.3.3 Session 3: Representation problems

Rationale: even though the topic of what is represented in games is one of the most frequently addressed topic in other game education proposals, there are some differences in how it is approached. The issue of violence is included in the approaches of Newman and Oram (2006), Klimmt (2009), and Fromme (2012). However, only Newman and Oram and Aglieri and Tosone (2012) give special attention to the discussion, controversies and social panic that can be created around the theme, whereas Klimmt’s approach focuses on protecting learners from having aggressive thoughts etc. Klimmt also describes a protective approach against stereotypical representations of race. Regarding gender, although stereotypical representation of women are briefly mentioned by Newman and Oram, they offer material for a whole session on women in video games, which problematizes mainly the male dominance in gaming

culture and essentialist perspectives that would ascertain that games are “for boys”. Closer to the approach taken here, Madill and Sanford (2007) highlights the need to create spaces in which young players can analyse their games with regard to the values that they reinforce. This need is also briefly mentioned by Zwieten (2011), Apperley and Beavis (2014), Klimmt (2009), Moumoutzis and colleagues (2014) and Felini (2012a). When the findings of Study 1 are taken into account, one could think that the fact that these issues were barely mentioned by the participants would lead me to exclude the topic from the programme. However, in this session my reasoning is exactly the opposite. It was precisely the absence of awareness of those effects – or, in the case of violence, the denial – that compelled me to include them in the programme. In other words, due to the fact that the influences addressed in this session are claimed to affect players unnoticeably, their presence in the plan is justified by the lack of awareness of players instead of their spontaneous interest or knowledge. Furthermore, in respect of gender, it cannot be ignored that almost all of the participants of the first study were male; perhaps interviewing more female gamers would have resulted in more participants reporting its relevance.

Pedagogical aims: at the end of the session the student should: (i) Understand the claims about the problems of the representation of gender and race in games, and its possible influences in the society; (ii) Understand a critical view of violence in games and the discourses around this theme; (iii) Be able to relate these ideas to their individual gaming practices.

Planned activities:

5 minutes Introduction	
Activity	Students were asked about comments from the previous session, and a brief comment about the topics of the current session was made.
2 minutes Video	

Activity	Students watched a video that addresses the positive emotions generated by playing games. Before watching the video, students were given the question “Do you think the feeling that comes from playing games lasts after you stop playing them?” as a preparation for the two following videos.
Resource	 <p>The image is a screenshot from a video. It shows a woman with blonde, curly hair, wearing a black leather jacket, speaking directly to the camera. In the top right corner of the video frame, there is a logo for 'big think' in orange and red text.</p>
	<p>Figure 3: Screenshot of the video “Gaming and Productivity” (McGonigal, 2012)</p> <p>The video “Gaming and Productivity” (McGonigal, 2012), is a 2:08 minutes video that shows Jane McGonigal arguing that some games generate positive emotions that remain after one stops playing the game (such as feeling more confident and acting more cooperatively). She then argues that producing positive emotions is a productive activity to do, instead of a waste of time, which is frequently associated with gaming.</p>
5 minutes	Video
Activity	Students watched a video that discusses the link between violent acts and violent gaming.

<p>Resource</p> 	<p>Figure 4: Screenshot of the video “Expert- Video games don't trigger violence” (CNN, 2013)</p> <p>The video “Expert- Video games don't trigger violence” (CNN, 2013), with Patrick Markey, is a fragment of a news channel of 5:08 minutes in which the journalist asks a psychologist (Patrick Markey) about the connection between violent video games and violence acts after a shooting tragedy in United States. Patrick Markey argues that laboratory studies suggest that violent gaming can, to small extent, stimulate aggressive cognition, but there is not much evidence about aggressive behaviour. He then dismisses the assumption that gaming is the main cause of shooting tragedies.</p>
10 minutes	Discussion
<p>Activity</p> <p>Students were asked to discuss in small groups, using the following questions as guidelines: “to what extent can games generate good or bad emotions that make people behave differently?” and “what do you think about the different opinions about it? (parents, media, friends...)”.</p>	
2 minutes	Task: favourite protagonists

Activity	Students were asked to write on a piece of paper the name of up to seven games appreciated by them that have a protagonist. (for the discussion after the following video, see below)
3 minutes	Video
Activity	Students watched a video that presents explains some of the sexism patterns that can be found in some games. Before watching the video, students were given the question “Do stereotypes have an effect in how we see the world?” as a preparation for the video.
Resource	<p></p> <p>Figure 5: Screenshot of the video “Damsel in Distress: Part 1 - Tropes vs Women in Video Games” (Sarkeesian, 2013)</p> <p>The video “Damsel in Distress: Part 1 - Tropes vs Women in Video Games” (Sarkeesian, 2013) with Anita Sarkeesian has 23:34 minutes, but only the first 3:10 minutes were used. It explains one of the recurring narrative patterns in the game industry, the damsel in distress (i.e. a male hero saving a female victim), illustrated with the case of Star Fox Adventures (Nintendo, 2002) and others, explaining why the recurrence of this trope is problematic. She also uses the example to briefly comments about the sexualisation of female characters.</p>

10 minutes	Discussion and counting protagonists
Activity	Students were asked to discuss the video and the gender and race of their favourite games, with two guiding questions: “Why these issues [rare or stereotyped representation of female and non-whites] happen?”, and “What are the potential consequences of that?” An extra resource to stimulate the discussion was when students were asked to check how many of the protagonists of games they wrote in their pieces of paper in the beginning of the session are female or non-white, and share with the group.
2 minutes	Optional homework
Explanation	Students were asked to ask a girl/woman who plays games whether she perceives these problems in female representation in games, and if she perceived, what is her opinion about it.
5 minutes	Online survey about the session

5.3.4 Session 4: Excessive gaming

Rationale: the topic of excessive play is the most obvious topic to include. It was included in the proposal of Fromme (2012) and it is the most pivotal aspect in Klimmt (2009). McGonigal (2011) also recommends no more than 21 hours a week in her “practical advice for gamers”. The literature discusses this issue, and it was also the only negative influence of playing games that was recurring and admittedly an issue for the players from the Study 1. It was also the most prevalent issue related to games according to parents and boys according to Kutner and colleagues (2008). Everything pointed towards the inclusion of this topic.

Pedagogical aims: at the end of the session the student should: (i) understand a critical view about the idea that people get addicted to digital games; (ii) reflect

about ways to prevent excessive gaming in their practices; (iii) understand some of the elements of games which stimulate compulsive play; (iv) be able to relate these ideas to their individual gaming practices.

Planned activities:

5 minutes	Introduction
Activity	Students were asked about comments from the previous session, and a brief comment about the topic the current session was done.
3 minutes	Video
Activity	Students watched videos that address excessive gaming. Before watching the video, students were given the question “What does it mean to be “addicted” to games?” as a preparation for the two following videos.
Resource	 <p>Figure 6: Screenshot of the video “Caught in the Web- Addicted to gaming” (BBC, 2010)</p> <p>The video “Caught in the Web- Addicted to gaming” (BBC, 2010) is a video of 2:32 minutes. It tells the fictional story of Kieran, who begins to play games at young age and develops a</p>

	compulsive habit of gaming, which creates many problems.
6 minutes	Video
Activity	Students watched a video that discusses game addiction.
Resource	 <p>The image is a screenshot from an animated video. It features three characters: a grey, textured character on the left, a brown, rounded character in the center, and a large green, blocky character on the right. The green character has a wide, toothy grin and is pulling on a string that is attached to the head of the brown character. The word "GAME" is written in large letters on the green character's body. Above the characters, the word "*Dramatization" is written in a bold, black font.</p>
	<p>Figure 7: Screenshot of the video “Game addiction (part 1)” (Extra Credits, 2010)</p> <p>The video “Game addiction (part 1)” (Extra Credits, 2010) is an animated lecture of 6:35 minutes. It argues that the gaming community should recognize that excessive gaming is a real problem, while also dismissing misconceptions about the topic. With this regard, the authors dismiss the hysteria about people dying due to gaming. They argue that the word compelling is more adequate than addictive in the case of games. They also comment about how excessive gaming can be the consequence of other problems, such as lack of parental responsibility, and are not necessarily a consequence of the medium.</p>
5 minutes	Discussion
Activity	Students were asked to discuss the videos, guided by the questions “how to know whether you are playing too much?” and “why are video games so appealing?”.

10 minutes	Game play
Activity	Students were asked to play the games CycloManiacs 2 (Kongregate, 2011), 2048 Game (Cirulli, 2014) and Solipskier (Mikengreg, 2010) and reflect about the compelling elements of these games.
15 minutes	The formula of enjoyment
Activity	Students were asked to comment on the elements of games that make them compelling in order to create with the tutor a common framework of game enjoyment.
10 minutes	Game analysis
Activity	In small groups students were asked to analyse the games we played in the classroom and some of their favourite games in terms of the compelling elements of each of them.
5 minutes	Online survey about the session

5.3.5 Session 5: Game creation

Rationale: This session was mostly inspired by the literature, and not by the result of Study 1. Although Study 1 had found that design practices were practiced rarely and seemed to have little relevance for participants, the placement of game creation in the centre of game literacy education in some approaches, including my own (Albuquerque and Cruz, 2013; Burn and Durran, 2007; Buckingham and Burn, 2007; Madill and Sanford, 2007; Felini, 2012) inspired the inclusion of game creation in this course. Creative practices are also recommended by McGonigal (2011) in her advice to gamers. However, because game creation was not in the centre of the proposal, the topic was covered in only one session. Consequently, it focused on sharing

experiences and talking about potential benefits of the practice rather than actually creating games in the school, in contrasting to the approaches reported in the above literature. Fromme (2012) proposed the closest approach to the topic, including youth culture, fan culture, and participatory media cultures as possible topics to be covered, but further detail was not provided.

Pedagogical aims: at the end of the session the student should: (i) understand some claims about the benefits of creating games; (ii) share with peers their game creation experiences (if any); and (iii) revise the whole course.

Planned activities:

5 minutes Introduction	
Activity	Students were asked about comments from the previous session, and a brief comment about the topic the current session was done.
3 minutes Video	
Activity	Students watched a video that illustrates how creating games can be beneficial. Before watching the video, students were given the question “What can you learn by creating games?” as a preparation for the video.
Resource	

	<p>Figure 8: Screenshot of the video “Learning STEM Skills by Designing Video Games” (Edutopia, 2013)</p> <p>The video “Learning STEM Skills by Designing Video Games” (Edutopia, 2013), with Kurt Squire and Gabe Zichermann is a video with 6:39 minutes, but only the first 2:35 minutes were presented. The video tells the story of Rhys, who is ten years old and likes to create games in an online platform where he can create and share with peers. He describes his experience creating games, and other people describe how beneficial it is for him, in terms of problem solving, creative expression, etc.</p>
10 minutes	Discussion
Activity	Students were asked to discuss about the video, guided by the questions “What else can we create with games?” and “Which skills can be developed by each one of these activities?”.
10 minutes	Course review
Activity	All the topics of the course were briefly reviewed.
10 minutes	Group interview
Activity	Students are asked to discuss in small groups ways to improve the Reflective Gaming Course, and share their insights with the big group.
5 minutes	Online survey about the session

In summary, the RGC was designed to cover the topics of tangential learning, cognition, problem solving, violence, stereotypes, excessive gaming and the benefits of game creation, in five sessions of approximately one hour each. Many videos were used, as well as discussions that encouraged students to express their opinions and describe prior experiences. Other topics could be

addressed, e.g. socialisation benefits in gaming culture and anti-social behaviour, as well as different activities, e.g. gaming diaries. Obviously, the design of a course always involves decisions about elements that are not included, but this course encompassed everything I considered necessary to conduct the first implementation of the Design Based Research process.

6. STUDY 2: THE REFLECTIVE GAMING COURSE

6.1 Introduction

The third research question (How is the Reflective Gaming Course experienced by learners?) and the fourth (What are the outcomes of the Reflective Gaming Course for learners?) demanded that the theoretical model of game education (ICEED) and the course design (the RGC) were investigated empirically. This chapter describes the first experience of implementing the RGC in a school, and the two research questions highlight the answers I was seeking: how students experience the course, and what are the outcomes of it.

6.2 Research methods

The aim of the study was to investigate how the RGC works in practice, which included how students reacted to it. On the one hand the classroom dynamics generated by the course plan were part of the answer to the research question: how can reflective gaming be taught? On the other hand, the individual experiences of students were part of the answer to the research question: how is the Reflective Gaming Course experienced by players? Hence the research methods cover two levels of data: one was concerned with classroom dynamics and other was concerned with individual experiences of learners.

6.2.1 Settings

This study was implemented in a comprehensive school in Nottinghamshire, in an area of middle to high socioeconomic status. The school has a teaching relationship with the University of Nottingham. The school is considered a well organised and high performing school, which was perceived as positive characteristics of the place to implement the my first study in schools. With the help of my supervisor, I contacted the school and met a teacher who was interested in supporting the research project. It was established that the course would be offered in five sessions of one hour each during the students' lunch breaks, spread throughout three weeks.

The teacher was responsible for choosing the student sample. He invited 13 students whom he felt had high interest in games. It can be assumed he had some knowledge about their gaming interests because the teacher was running regular gaming sessions for students during the lunch breaks – and playing with them himself. From the 13 names on the list, ten answered the first online survey prior to the course, nine turned up in the first session, while only eight ended up participating in the course (i.e. three quit the project before doing any activity, one quit after filling the online survey, and one quit after going to the first session). Even though the initial list suggested there may be potentially at least one female present, in the event, participants were all male, and their age ranged between 14 and 16. According to self-reports, the participants played, on average, 11.3 hours during term weeks, ranging from ranging from a minimum of 3 to a maximum of 28.

6.2.2 Observations

In addition to being the tutor of the course, I also had the role to observe the session while I was teaching. In order to do it, I took field notes right after the session was finished, and later I wrote reports for each session. The sessions were audio recorded, and the recordings were used as memory aids during the report writing up.

Initially I understood that the teacher would be present during the sessions, and I planned to have brief talks with him after each session about his impressions, as well as a formal interview in the end of the course. His perceptions would add to the researcher's view of what occurred in the classroom, which would allow me to triangulate the observations. However, probably due to a misunderstanding, the teacher was not consistently present in the sessions. He would come and go during the sessions, and in some sessions he was totally absent. Consequently, his observations of the sessions were abandoned as a complementary perspective on classroom dynamics, and the observations were limited to my own. I kept, however, the interview with him at the end of the course as will be explained in the next section.

The objective of the observations was to create a descriptive account of what happened in the classroom. This study can be considered mostly an exploratory phase, following an unstructured form that aims to “find out what is going on in a situation precursor to subsequent testing out of the insights obtained” (Robson, 2011, p. 317). There were, however, a few elements of the interaction between students and activities that were of particular interest to the study. They were the students’ involvement with the activities and the responses they gave, such as: the expression of opinions, understandings, previous experiences and arguments, as well as the ways in which they engage in the activities.

6.2.3 Interviews

At the end of the course, the eight students were interviewed. The interviews were individual, face-to-face, and semi-structured. In the beginning of each interview, students were asked to be as honest as possible in order to improve the quality of the research; it was emphasised that their identity would not be revealed, and that their participation in the course was much appreciated. The basic questions were the following:

- Did you have the chance to talk about any of the topics before the course?
- What were the positive points of the course? Your favourite sessions and topics?
- What are the negative points of the course? Your least favourite lessons and topics?
- Did you think about reflective gaming during the other days of the week? Why?
- Do you think your approach to play games changed in any way?
- What was the most valuable thing that you learnt?
- Do you have any other comment or suggestion?

These questions were complemented by follow up question to expand any interesting information that they had shared. As it can be observed from the questions, some focused on their opinions about each session, whereas others

focused on the kinds of impact the course had in their gaming practice and perspectives. (Respectively the third and fourth research questions)

During the last interviews I offered to students the link to an online form in which they could give me feedback anonymously if they wished. It aimed to allow students to express ideas that they could have been embarrassed to express to me, hence decreasing the problem of my double role of tutor and researcher.

Additionally, the teacher was also interviewed despite his limited presence during the classroom activities. The interview model was similar to the one with students, but the questions were as follows:

- How do you think it went?
- What could I do to improve it?
- Could it fit into the curriculum?

The interview with the teacher was deliberately less structured than the ones with the students, allowing for more improvisation.

6.2.4 Surveys

There were three different kinds of online survey that the students had to fill. Students identified themselves in the online surveys using an individual code.

The first was a task in which they had to write a short advert for one of their favourite games, prior to the course. The tutor sent this online form with them. Initially they would be asked to write another advert after the end of the course, allowing for an analytical comparison between the pre and post adverts, checking for differences in how they expressed opinions and judgements about games. The hope was that the analysis of the differences of the written adverts would offer insights on the impact from the course on their discourse about games. However, this method did not work as expected. It is further discussed in the section 6.4.7.

The second was an online survey that they filled prior to the course in order to inform about their gaming practices. Again, the teacher was responsible for

sending this online form for them. Students were asked about age, number of gaming hours per week, favourite game titles, and the good and bad influences of gaming. All the eight participants answered this survey.

The third were online surveys specific to the content of each session, which they had to fill in the end of each session. It aimed to generate data on the students' understandings and interpretations of the topics, and also offer more possibilities of feedback from students. All the surveys had an open question: "do you have any comments about this session?" In addition to that, they were asked, in each session, the following open questions:

Session 1

- Have you searched for topics in a game before this session? If yes, which games and which topics?
- Did you find out something new about a game topic in this lesson? If yes, which games and which topics?
- Which other ideas for future search about the topics of your games do you have? (please write the game and the topic)

Session 2

- Do you think you developed any abilities by playing games before this session? (such as strategic planning and motor skills) If yes, which games and which skills? If no, why not?
- Do you think you will develop any new abilities by playing computer games that you like? If yes, which games and which abilities/skills? If no, why not?

Session 3

- Do you think there is a degree of racism in game industry? Please comment.
- Do you think there is a degree of sexism in game industry? Please comment.

- If you think there is violence, racism or sexism in the game industry, what can players do about it? (if you think there is not, just write it)

Session 4

- Do you think the time you spend playing games prevent you from doing other important things? Please comment.
- Do you think it would be better to you to play games for less time? If yes, what could you do to help you to play less?

The session 5 had no online survey in the end, because it had a group interview instead.

6.2.5 Group interview

The group interview at the end of the last session was designed to create an opportunity in which students could redesign the course themselves. Instead of treating them only as participants, they were asked to think as co-designers of the improvements of the next research iteration. They were given a sheet with a very brief summary of each session of the course, and they were asked to redesign the course in small groups followed by a moment of sharing the ideas with the whole group.

The questions used in the interviews and online surveys can be found in the Appendices 2, 3, and 4, which are, respectively, interview questions for students, interview questions for the teacher, and online survey questions.

6.2.6 Data analysis

The data were divided according to each stage of the course, which also required a division by topic. Because there were no excessive amounts of data, all the material could be read many times and the coding simply grouped the answers related to each question, and each session. This decision was taken as it was felt that this was sufficient to achieve the objective of this study, which was to generate a detailed descriptive account of the course in practice.

6.3 Findings

The outcomes will be described following the chronological order of the course. However, results from the initial survey, individual and group interviews that deal with specific topics will be grouped with the respective session. In the end the findings regarding the course as a whole will be addressed. Individual students will be referred to by pseudonyms.

6.3.1 Games as learning stimuli: curious gaming?

This session introduced the course, explained the concept of tangential learning through a video, and encouraged students to exchange their experiences of tangential learning and finally proposed that the students carry out tangential learning in the classroom.

6.3.1.1 Prior perspectives of students

Students seemed to have many prior experiences of tangential learning. When asked about their names and previous experiences of tangential learning, they offered plenty of examples that focus mostly on historical facts or periods, such as searching for the Crusades inspired by Assassin's Creed (Ubisoft, 2007), and for the World Wars inspired by Call of Duty (Activision, 2003). Other examples can be seen in the comments made by Patrick, who mentioned he had searched for the concept of anti-matter after playing Starmade (Schine, 2012), and Adam declared he had read *the Prince* by Niccolò Machiavelli after playing Assassin's Creed. The answers in the online forms corroborate with the fact that tangential learning had been widely experienced by students before the course: all students described some kind of tangential learning, including history (dates, periods, and countries), mythology, space exploration, particles, weapons, machines.

6.3.1.2 Classroom activities

The introduction to the course was followed by the triggering question concerning what they had learnt with games and the video on tangential learning, which seemed to be engaging to students and relate to their prior experiences with gaming and learning out of school.

Contrastingly, the two other questions (“do you think the experience of gaming changes after tangential learning?”, and “What else can we search in games that wasn’t searched so far?”) did not generate much interaction. When asked whether the gaming experiences change after tangential learning, one (records are not precise as to who) commented that knowing the end of a historical episode could spoil the gaming experience, which can be described as less significant than the experiences described in the previous study that clearly valued tangential learning. When asked for unsearched topics for future tangential learning, the students struggle to generate them.

The session turned to the next activity of conducting tangential learning in the classroom. Although students engaged in the experience, the task was not done as planned. Two out of the four groups searched for topics they had searched for before (anti-matter and Assassin’s Creed historical periods). One group misunderstood the activity and searched for information about Minecraft (Mojang, 2011) itself instead of its cultural references. The last group also searched for the historical periods of Assassin’s Creed, but they searched for Internet sources that offer a commentary on the accuracy of the historical elements of the game, comparing historical facts with fictional ones. This differed slightly from the original idea of tangential learning of searching for the topics themselves (e.g. The Crusades) instead of a commentary about it (e.g. an article with commentary on how Assassin’s Creed depict the Crusades), but the activities are similar. This struggle to find new and unsearched topics was evident from the surveys as well, when Oscar, Ewan, Christopher, Harley, Henry and Jude described approximately the same thing in two different sections of the survey: in the question about tangential learning experienced *prior* to the course and in the one about what was searched *in the classroom*. However, in the question about new ideas for *future* tangential learning, they might have described genuinely new topics, even though Harley admitted in the interview that the topic he described as “future” in the survey had already been searched by him, therefore it was not really a new topic to search, for him. Similarly, in the interviews Christopher commented on this difficulty:

I didn't really have much to research in the first session. (...) I think it would be a lot easier for the first session if we had like, a topic to research. (...) I think that would be a lot easier because there is a massive variety of different games out there so I was trying to think of the best ones to research which I haven't really researched before.

In this regard, the answers of Adam in the survey might help to clarify the responses of his colleagues: when asked about what he found out in the session about a game topic, he wrote: "Not much this lesson, because I didn't have any topics of interest that I hadn't researched". In the question about whether he had new ideas for future tangential learning, he wrote: "I don't really. I immediately search about a topic if it is of interest". Although it seems like a reasonable explanation, the data does not indicate whether they were searching for different aspects of a familiar topic when searching for a topic they had searched before. For instance, one could search for the geographical aspects of the Crusades, and then later search for the religious aspects. It can be argued that topics such as anti-matter and the several historical periods involved in the Assassin's Creed series, as many other game topics, offer opportunities to investigate multiple times and with different scopes and degrees of depth. The findings do not reveal whether the classroom search practices differed significantly in that sense from their previous practices.

Despite the apparent difficulty with finding new topics, students seemed to enjoy the session. When asked to share the results of their investigation, it did not seem to be an issue that the topics were at least similar to the ones they had searched before. With regard to its popularity, Harley and Henry declared in the interviews that this session was their favourite of the course; and it was the ranked as the second favourite by Jude, Ewan and Adam. Their comments on the online survey also were all very positive: three of their comments emphasised that the session was engaging, such as Patrick: "It was fun :D". The other five emphasise their interest in the topic, such as Christopher: "I think this session was very interesting and I'd like to learn more on tangential learning".

6.3.1.3 Outcomes of the session

For at least four students, although they had had experiences with tangential learning before the course, the course played a role in making them aware and reflective about the process. Some statements suggesting this can be found in the online survey. Harley wrote: “It got me thinking about what I learn from playing video games. I found this session interesting”, and Henry: “It was very interesting to hear other peoples’ ideas”. Also, in the interviews Jude said it was “quite interesting because I never thought of it”, and Adam declared about this session: “I don’t know about [being] useful, but I suppose it is good to consciously think about what you are doing [referring to tangential learning]”. When asked about the impact of the course as a whole, Ewan said, “I looked slightly a little bit more stuff up sometimes”. In conclusion, it seems there is some evidence to suggest the session opened the students’ eyes to learning possibilities that they were already carrying on, but there is very little evidence to suggest that the frequency of tangential learning experiences increased.

In summary, the opening session approached a positive aspect of gaming: tangential learning. It seemed to be appreciated by students, and to relate to their prior experiences. Although the video seemed to be a successful tool to introduce the topic, the following activity of conducting tangential learning in the classroom was well liked but did not go as planned.

6.3.2 Games as mind training: getting smarter?

The second session introduced the idea of gaming and cognitive gains through a video. It then discussed the idea of cognitive gains and problem-solving skills, offered a session of game playing, and asked students to analyse both the games they played in the classroom and their favourite games with regard to the cognitive gains that potentially results from playing them. Students were also encouraged to reflect on how these cognitive and problem-solving skills relate (or not) to their daily activities.

6.3.2.1 Prior perspectives of students

At least five students had preliminary ideas regarding these influences of gaming, as was evident from the discussion and from the online surveys prior to the course. Ideas regarding this session were the most prominent in their answers in the question on the good things that come from gaming. They wrote “improve your thinking skills” (Oscar), “increased cognitive function” (Adam), “helped my coordination and also improved my maths” (Ewan), “Learning to adapt to situations and expand ideas for countering the problem” (Henry), and “develop some social skills (...) help to strengthen your frontal lobe with new behaviour rules” (Patrick). In the interview Oscar shared a previous experience that shaped his belief in the power of gaming:

I always thought, like, games would make people smarter. Because when I used to play Pokemon I was very poor at, like, advanced... my English was only generally picked up and... I used to play Pokemon when I was younger helped me with adjectives. Because they always have, like, you know the moves? They do... they always have like a verb, then an adjective. So it helped me out with adjectives.

When asked in the interviews about the existence of discussions about the topics prior to the course, although most students had no experience in that sense, the cognitive benefits of playing were mentioned by two students: it was a topic that Adam had discussed with his father previously; Patrick said he used to employ such arguments as excuses to his parents to play more: “when my mom says to get off [the game], I go ‘well I am improving my eye sight, my behaviour protocols (...)’ so I was using as an excuse to stay in the game”.

6.3.2.2 Classroom activities

Despite the abundance of previous ideas on these topics, when students were asked to give examples of potential transfer opportunities, i.e. to cite non-gaming examples in which these skills would be useful, they struggled. They eventually managed to give three examples: some of the skills could be useful

in a military career, in an architecture career, or, in the case of improved eye sight, it could be useful to read the blackboard from the back of a classroom.

In this session the video also seemed to be engaging to students. Some of them responded out loud to some of the questions posed to the audience in the video. When asked to recall the cognitive benefits of gaming according to the video, they remembered them well. In the discussion that followed I added other claimed benefits on cognition and problem solving, and they seemed to understand those.

The gaming session seemed to be very engaging for the students, and the fact the games were simple, free, and browser-based did not seem to prevent them from immersing in the games. The next activity was to write down skills developed by gaming (e.g. attention) together with the respective game title (e.g. Call of Duty) and non-gaming context in which they believed it would be useful (e.g. driving). Again, although they cited many skills, they found it difficult to think about concrete examples of use. Only one group wrote down concrete examples of use, which included army, architecture, survival, driving and football management (with respective associations to games and skills). The other two groups wrote skills with no relation to examples of use. Amongst the skills there were creativity, adaptation, strategy, self-control, coordination, reflexes and awareness. Some students mentioned ideas that were not addressed by the video of the discussion. It was the case of creativity and self-control when they were analysing games, and “scan an environment quicker”, which appeared in the online forms afterwards. It suggests they were actually reflecting about the topic instead of just repeating the concepts presented to them immediately before, perhaps using their prior knowledge.

This session was the most popular amongst students. From the seven students who attended, five considered it to be their favourite, and the other two ranked it as the second best session. With the exception of one student who left the section for comments blank, the other had positive comments, including “I am learning a lot” (Patrick), “Can’t wait for more” (Oscar), and “Opened my eyes” (Henry). Considering that this session was the main bearer of the positive influences of gaming, its popularity might be related to this. Especially when

the following perceptions were shared in the interviews: Henry declared to find it interesting to see benefits in a context where previously only negative aspects were mentioned. This prevalent negative view of gaming was mentioned by the teacher, and also by Oscar while he was explaining the reason why this session was his favourite. The latter said:

Because I know a lot of people, generally when you think, scientific reasons about games you generally think negative. But... but that one [session 2] was a more positive side. And so, that sort of like, made me think more about it, rather than just thinking "science said games are bad, science said games do this", but then actually, you say, games make you smarter, it got a more balanced argument there.

6.3.2.3 Outcomes of the session

The task of thinking and discussing about concrete examples of use of transferable cognitive gains from games aimed to encourage a critical understanding of the literature claims, which is opposed to a simplistic or celebratory one. It is arguable whether these activities achieved this goal. In their answers to the online survey, subtle signs of criticality were found. Ewan, Henry and Patrick were more straightforward about the skills developed through games, like in these illustrative quotes from Henry's survey:

I think I have developed fine motor skills, adaptation and strategic thinking by playing lots of fast paced games such as "Starcraft 2" and "Planetside 2". (...) I think I shall develop many skills such as reaction speeds and general knowledge due to the wide variety of games available.

Contrastingly, signs of a more critical account were found in the answers of the other four students, who mixed some straightforward beliefs with some pondering. In this respect, Harley wrote about developing abilities in the future: "If I were to develop any skills from video games I think I would have done so by now", which suggests a limitation to these claims. In the same question, Oscar said: "I won't develop many more skills if I continue to play

the same game over and over again however new games would change how I think about it”, which expresses a reflection that was not explicitly discussed in the classroom. Jude said: “I’m not sure what abilities I have developed yet but I’m sure there are more to come”, and finally, Adam responded about the abilities he had developed: “Perhaps, but I’ve never consciously attributed any of my increased cognitive skills to gaming”, and in the following question he offered a more pessimistic perspective: “I wouldn’t imagine it would have a noticeable impact on my life enjoyment, so I think it’s better to admit you are wasting time for fun than attempting to justify your bad habits”. His opinion contrasts with Henry’s, which is illustrative of a more celebratory one. It might not be a coincidence that Adam and Henry also are in the extremes regarding the number of hours they declared to play in term weeks. The former declared to play only three hours, whereas the latter, 28 hours. Even though this fact might seem suggestive of a relationship between intensity of gaming practice and opinion (i.e. more engaged gamers are more likely to be optimistic about the influences), this pattern did not apply to the other students, and obviously the numbers are too small to be conclusive in this respect.

The outcomes of this session, however, were not limited to the opinions mentioned above such as celebratory, pessimistic or critical. Their self-reports suggested two other outcomes. The first one is to develop a reflective habit regarding the topics of this session. When asked about the impacts of the course in general, two students mentioned topics of this session. Patrick declared:

I will now be more likely to think about these different things.
Session 2, it might make me, like, be curious of what the game
is actually doing to me, with my cognitive functions.

And Jude shared this perception, which illustrates the development of a more reflective account of gaming:

I have been thinking about more how it actually is in my head, I
know... when I play a game of Fifa, I know that... I got
something in my head of how I’d like to do it, so, I suppose,

yeah, these sessions have had an effect on how I play. And how I think about games. (...) it is just the way of how I think about it now. I just do find gaming a completely different aspect now. To me, before this, it was just a game. And now... to me, it is still just a game in some aspects, but it has changed on how I think about what some games might actually be teaching me.

In conclusion, this session built on the previous one, covering other potential positive aspects of gaming. Apparently the session was very much appreciated. The video seemed to be engaging and informative; the gaming session seemed to be engaging. However, students found it difficult to think about concrete examples of use of cognitive skills developed in gaming. Regarding the outcomes of the session, there were signs of a critical understanding of the cognitive gains of gaming, and a few students described that they are more reflective about their cognitive involvement with games. Based on my impressions, it was in the second session that they really began to feel comfortable with my presence and the microphone. Whereas in the first session they seemed shy sometimes, in the second session and thereafter a more informal environment was established. It was marked by their participation in general, by the presence of jocular comments; by the liberty one student took when he asked to play the game in the tutor's computer, and because they asked me about my favourite games.

6.3.3 Games as messages: hidden lessons?

This session proposed discussion about violent games and the media coverage of it, as well as stereotypes of gender and race. In the case of violence and gender stereotypes, videos were used to enrich the discussions. Students were also asked to write down their favourite protagonists, and later on they checked the diversity of that sample.

6.3.3.1 Prior perspectives of students

Regarding violence, in the online survey prior to the course four of the current students had shared some ideas regarding violence: that you could become “a serial killer” (Oscar), “psychopathy” (Adam), “people say that video games

make people more violent” (Christopher), “Some games promote violence in the urban area such as some scenes from GTA V [Grand Theft Auto] or COD [Call of Duty]” (Patrick).

Regarding representations of race, students made no comments in the online survey prior to the course. However, when the question about stereotypes was made, they spontaneously gave examples on race and ethnicity. They cited the examples of foreigners – and especially Russians – always being the enemy, that Japanese games could make people believe that Japanese people are “like anime”, that black people were often depicted as criminals, and that most protagonists are white. They also seemed to agree that these stereotypes have negative consequences on non-gaming context, and one of them commented about the anti-Semitic ideology that made the Holocaust possible. Adam, however, made the following comment in the classroom:

Stereotypes are not always bad... They usually have some merit behind them, or some real reasoning, so perhaps, actually, perhaps you learn more about culture rather than being a bad thing just in general. (...) The fact that black people commit a lot of crime in a...in... because black people do commit a lot of crime in real life. That is not racist, though, it is just statistics, it is almost teaching you a statistic.

He commented later that a person should not, however, use the stereotypes in their daily lives, “unless they are idiots”. The data suggests that Adam was an isolated case in his ambiguous defence of racist representations: the other students seemed to consider stereotyped representation and the lack of representation of different ethnic groups were relevant problems.

Regarding gender, no participant mentioned it in the prior online form, and the only feedback from students before the video and discussion was another reaction of Adam. When I asked whether they knew about Anita Sarkeesian and her videos, Adam said: “Is this crazy feminist woman? I hate her!”

About the session as a whole, there were different opinions about the *novelty* of its topics for students. In the group interview, Jude declared that although he

disagreed with the opinions exposed in this session, he really appreciated it because topics such as violence, sexism and racism are rarely discussed in the school. Oscar expressed ambivalent opinions: after this session, he wrote in the form: “It was good learning about ideas that I don’t take much notice of”, but later in the interview he said stereotypes and gender are topics that “as you grow older you know these things more and you are taught this more in school as well (...) you don’t actually have to do a full session on it”. Harley expressed a similar opinion in the interview: “Stuff we already know. How they [games] got sexism and violence”.

6.3.3.2 Classroom activities

In the first part of the session, the first video had Jane McGonigal talking about positive emotions generated by gaming, followed by the second with Patrick Markey discussing the negative influences of violent games both in research and in occasional exaggerations of the media. After the videos students were asked about the emotions generated by gaming, they mentioned more of so called negative feelings (anger, sadness, frustration) than positive (they only mentioned euphoria). Jude raised a personal experience in which he became infuriated after losing a game of Fifa (Electronic Arts, 1993) and broke his video game control, which generated some discussion on aggression. It seemed to me that with the exception of the controversial Fifa episode, students seemed to agree with the CNN video with Patrick Markey on gaming and violence. There was no student either arguing that games are the main cause of shooting scandals or that fictional violence generates no influences whatsoever, hence this discussion seemed less fruitful than the next one. Even the occasional exaggeration of some media vehicles seemed consensual.

After the course, in the interviews and surveys, students expressed more opinions about the race and gender than violence, suggesting that race and gender were richer and more relevant for them at the session. However, this prioritisation of the second section was intentional and inherent to the session design and also in the survey questions – that emphasised more racism and sexism than aggression – therefore leading to some extent towards this conclusion. Similarly, the design emphasised sexism more than racism.

When the topic of the session moved to approach race and gender stereotypes, some emotional responses were triggered. A short discussion about stereotypes took place, when only race was approached by students. If the controversial prior opinions of Adam (described in the section above) cause some debate about representation of race, after the video of Anita Sarkeesian the debate got heated, centred mostly on Adam. Whereas in the race discussion Adam seemed to be alone, the gender debate seemed to divide the group. Students seemed to perceive race representation, in general, more of a problem than gender. It becomes clearer when we consider that initially, when asked about stereotyped representation, they spontaneously mentioned race representation as problematic, almost consensually. Contrastingly, even after watching a video explaining the issues with the gender representation, they would still be divided about its relevance. Adam exclaimed: “I don’t see why I should care? What is the impact in real life? I think it is a frivolous issue, she [Anita Sarkeesian] is just picking upon semantics”. To counter the feminist argument, the example of Lara Croft (from the Tomb Raider series, Eidos Interactive, 1996) was cited as a strong female protagonist/heroine. The idea that most players are male was also raised as a justification. Adam also said: that “There is sexism in both ways [against men and against women]. Perhaps there is more for either one, but I don’t think it matters”.

Christopher was the only student who spoke up for Anita Sarkeesian in the classroom discussion and who took a proactive approach to the problem. In the survey he repeated what he said in the session, about what players could do about this problem: “They can complain to the company and state that they believe the company who created the game is being sexist, racist etc.”

Before approaching the topic of stereotypes, students were asked to write in pieces of paper the names of their favourite game titles with protagonists. At this point they were not aware of the next topic. After all the discussions about race and gender students were asked to check the numbers of female and non-white characters amongst the protagonists of the game titles they had written down, Adam seemed to be irritated, screwed up his piece of paper after

realising that only a couple of all games depicted a female or non-white protagonist.

During the discussions my presence was limited to pose some triggering questions, make some comments, and ensure that the discussion remained within the topic. Although I have strong opinions about the topics of this session – particularly about gender and race representations – it was expressed mostly through the questions that I was asking to stimulate the reflection. It was done in this way to allow learners to freely express and problematize their views, which is part of the *emancipatory* aspect of the ICEED Game Education Model. It can be argued that there was no neutrality: my position was expressed through the video selection and to some extent through my presence in the discussion. However, to my perception and probably in the students', I nearly remained on the fence during the whole session. It made me feel very bad after the session, because my theoretical background considers that teachers *should* stand against issues such as sexism and racism, and the resistance that naturally emerged from students against those in the classroom did not feel to be enough.

Another aspect of the ICEED model defined is that the education process should be *critical*. Hence I decided to make a comment about my personal views on those topics in the last session, during the course review. I stated my position clearly, declaring to be a feminist man, and shared with them some concerns about the importance of media representation of race and gender. The result was that Adam and Patrick were clearly shocked with the idea of a feminist man (I said “feminist man”, but perhaps they heard “betrayal”) and in general it seemed that they took the matter more seriously when they saw where I stood, at least at the moment. Or perhaps they were only discouraged to demonstrate opposition to “the tutor”.

This session was less popular than the first (tangential learning) and the second (cognition), which approached positive aspects of gaming. It is hard to compare its popularity with the fourth one (excessive gaming), because the fourth had serious implementation problems. It was clearly more popular than the fifth one (design practices), which was considered the least popular. Only

Patrick, and Ewan made positive comments in the survey, whereas Adam expressed his disagreements with the whole feminist point again. Christopher, Harley and Jude made no comments.

6.3.3.1 Outcomes of the session

The outcomes of the session are difficult to pin down. The opinions that they shared after watching the video about violence did suggest a more critical account of the topic than they expressed in the online form prior to the course, which echoed ideas that gaming creates serial killers, for instance.

The question of whether there was any change in students' views regarding the representation of race and gender is even more difficult to answer. One the one hand, it seems that some students began the course considering problematic representations of race an issue, but not so much when it comes to gender. And in some cases, this approach seemed to remain. Some evidence is found in the comments that Jude and Patrick expressed. The words below from the interview of Jude express a fatalist view on the gender issue, and a concern with race:

I just found that the games aren't made to go to the feminine side of views these days because it is just how it started and it'd be like... if you started it now it wouldn't work because it is like... the audience is male people. It is how it has been for ages now. So now, if you... when, like, games started coming out, like, consoles and started making more interest to the feminine side of things then obviously you have a more feminine audience but that is just not how it works so... I just didn't agree with some of the things that have been said, so... I just... I don't know, it is just my opinion. (...) Also, I disagree about the gender bit, but about the stereotypes on the, like, the race, I don't like that one bit, to be honest. How it is... you are right when you said that. You find that in games like GTA the bad guys tend to be black.

Patrick also expressed a concern with race that does not apply to gender. He wrote, about the existence of racism in games: “Yes, different ethnic groups will be portrayed differently because of the stereotypes [sic] that exist about them”, whereas in the same question on sexism, he wrote: “Nope [referring to the existence of sexism in the game industry] because both genders have different physical abilities and traits, men aspire to be at the peak of physical form, and they desire the physical form of women, that is why they are used as objects in the game for sexual desire”. Adam was an especial case in the group. He seemed to regard both race and gender representation as irrelevant topics during the session and in the end of it, when he wrote: “Sexism must include discrimination or prejudice, not just a harmless stereotype”, and used exactly the same phrase to refer to racism. In the interview, which was after I expressed my personal opinions on the topic, he expressed a more pondered view. Although it expressed a fatalist perspective, at least he began to recognise that there is an issue:

It can't be that good, that such generalisations exist, but there is not really a solution to any of these problems. Like (...) Sarkeesian pointing out that most plot lines are a man saving a woman... what does she suggest to do instead of that? I just think it is a bit farfetched really.

On the other hand, four students seemed to consider the topic of female representation in games relevant and expressed it in the surveys. However, it seems that they were not able to really approach the question on why the representation of characters is relevant (i.e. whether it has an impact on “real life”), or to counter the idea that “game industry and audience is male dominated, always has been and will always be”. The case of Ewan illustrates someone who agreed with the relevance of the problem, but who was still confused about the whole topic even after the course. In the interviews he mentioned the gender discussion as part of the impact that the course had on him:

I found it interesting. Because it is kind of... new perspective. It makes you look things like in a different way. Because, like,

when we were talking about how there is always a male hero. I never really thought about that. I never... it never came across my mind.

He was the only student who had done the home task of asking the opinion of a female player. As he described in the beginning of the next session, she seemed to perceive that there is some sexist representation of women, but also considers that it would be “weird” to shift roles and have a female hero saving a defenceless male. Both she and Ewan seemed unable to problematize this matter further. In the interview he was asked about it, and said:

It is like, now it's kind of normal to have a male protagonist and antagonist, rather than having a female protagonist, now... because it is kind of... it's kind of sort of to do with how you... what you grown up with... because then you think it is normal. Don't you? Because it is kind of what you are used to.

Ewan seems to illustrate someone who, whereas he was interested in the topic and open to discuss it, did not have the chance to develop his ideas about the topic very deeply. I can conjecture that he would benefit from covering the topic with time and depth, which is something that this model of course did not do, as three complex topics were covered in less than hour.

In summary, this session addressed representations of violence in games – and the possibility of a sensationalist journalism with this regard – as well as problematic representations of women and non-white characters in games. Whereas the topic of violence and race representation were closer to a consensual perspective, gender representation provoked emotional reactions and debate. In general, violence and problematic representations of race seemed to be more easily accepted as potential problems of gaming than problematic representations of gender, and the (all male) class of students revealed some ideas – especially about gender – that were perceived as problematic. This suggests that ideally gender representation would be addressed at more length.

6.3.4 Games as engaging objects: addiction?

Unfortunately this session could not be delivered properly due to unexpected events in the school. The session began late, had to move rooms twice, had technical problems with the sound system in one of the rooms, one game could not be unblocked from the school server, and the session was interrupted earlier than expected. Consequently, only a few activities were implemented: there was a brief discussion about the previous session; a game was played briefly, and the discussion of the compelling elements of games began. The online surveys were not filled. Essentially, the data from this session was too poor to be taken into account. Probably the only thing that can be said was that the students seemed to find it difficult to generate abstract concepts of the compelling elements of games, but perhaps it was due to the chaotic atmosphere.

6.3.4.1 Prior perspectives of students

They did express ideas about excessive gaming in the online surveys prior to the course that unfortunately could not be discussed properly: “loss of time” (Adam), “it becomes addicting” (Ewan), “They can become addictive” (Harley), “becoming addicted and taking over your life” (Jude).

6.3.5 Games as design practices: game creation?

The last session offers a video about the benefits of game creation, and encourages students to share their experiences and discuss the video. The session was shorter in order to fit a review of the whole course followed by a group interview in which students were asked to redesign the Reflective Gaming Course.

6.3.5.1 Prior perspectives of students

The only evidence that constructive practices were part of students' experiences was the fact that five out of eight cited Minecraft (Mojang, 2011) as one of their favourite games.

6.3.5.2 Classroom activities

After the video about game creation was watched students were asked to think about other forms of creative activities related to games, such as map creation or fan art. They were asked to share some of their experiences and opinions about the topic of the benefits of game creation. Adam made a comment about his experiences with Minecraft (Mojang, 2011), which offers some design practices for players. His intervention generated some other comments. In general, it seemed that concrete skills such as graphic design and programming were considered more important than more abstract ones, such as prototyping, storytelling, interaction design, etc. Students did not seem motivated to engage in this discussion, despite their familiarity with Minecraft and perhaps other forms of constructive practices. It was confirmed later in the interviews that this session was overall considered the least popular. Some of the comments around it were made by two students who both really enjoy Minecraft. Ewan said:

game creation... not many people kind of going to creating games... if you just kind of ask what would they want to be and not many people say they want to go around like creating video games.

And Oscar shared the following:

I think it was slightly less valuable because some people play games because of creation. And they have already seen that in the game but others would just see the game was designed for entertainment purposes, if you know what I mean.

6.3.5.1 Outcomes of the session

Students seemed to find this session the least relevant; in their interviews there was no evidence that it stimulated neither more reflective practice, nor a change of perspective. Adam, in the group interview, described this session as "insignificant".

In conclusion, the fifth session occurred with no major incidents. The session, however, seem to raise little interest in students. This session was shorter than the others due to the group interview at the end.

6.3.6 The course as a whole

Various statements made by the students and the teacher were not specific to one of the sessions, but were impressions about the course as a whole. Some of the findings that are specific to a session are also briefly mentioned below for a second time in order to draw a clear overall picture.

6.3.6.1 Prior perspectives of students

One of the topics addressed in the interviews were the opportunities to talk about the topics prior to the course, and the experiences they related in this regard were very limited. Three students declared they had discussed some of the topics before the course: the experiences of Adam and Patrick were described in the second session: the former discussed cognitive gains with his father, the latter had employed those arguments as an excuse to play more. Furthermore, Oscar remembered talking about racial stereotypes.

However, most students declared that they did not address those topics before the course. Five students declared that they had no prior opportunities to discuss the topics, illustrated by Jude:

I never really thought about it in that way as I said, it was just... just playing with my mates to me. Playing and having fun. But now, yeah, I never really talked about it before. Not before these.

Moreover, there were two ideas that were expressed by students in the online survey prior to the course that were not covered by the course design. The first was the idea that playing games make people less social, as described by: “Sometimes you can become anti social” (Oscar), “when you are playing them you become anti social and don't talk to people” (Ewan), “you can't socialize properly while on them.” (Harley), and “it can be less socialable [sic] but you

can talk with actual friends online” (Henry). The second was the idea that playing games make players lazy, such as in: “you become a lot more lazy” (Ewan) “you can become lazy” (Christopher). Although those were not included in this design program, they could be discussed in future versions of the course, especially if other studies find those recurrently. As it was stated before, it was not the aim of this version of the course to exhaustively cover all the topics around the influences of gaming.

6.3.6.2 Classroom activities

The teacher was present in a couple of sessions, and he selected the students, reminded them, ensured they were coming to the sessions, and talked to some of the students about the course. When the teacher was interviewed, he shared the view that students were really enjoying the course:

I thought they were very enthusiastic. (...) they found what you say quite stimulating and that, then, caused some debate, which I think was very nice, they did that quite enthusiastically. (...) They were genuinely interested. (...) I thought they were enjoying the sessions but I didn't really know how much they were, then, taking away with them. But that [his conversation with students] suggested they were thinking about it quite a bit, so... it was a nice touch, I thought.

With regard to the aspects of the course that either worked well or could be improved, he considered that relying on videos was imaginative and worked well. He also emphasised that practical experiences – such as playing games – followed by discussion or analysis was more engaging to students than long discussions. The idea of having more game play was also mentioned by Ewan in the group interview.

I was expecting to have more feedback about how to improve the course from the group interview. However, it offered little insight about the whole process. On the one hand, it could be argued that the amount of time allocated to the interview was not enough; the following activities occurred in approximately ten minutes: students discussed in groups, wrote down some ideas and shared

them with the whole group. On the other hand, some students were not inclined to write anything down – it was perceived in previous activities with this group – and possibly the task of improving the course plan was too complex. Finally, there was also the difficulty of expressing honest feedback publicly, which could have inhibited students. Consequently, few ideas emerged from the group interview, and it showed to be an inefficient method in the way it was implemented in this specific context.

6.3.6.1 Outcomes of the course as a whole

Regarding the general outcomes of the course, there are two aspects that will be presented here. The first is related to the experiences that students had of talking about the topics after the sessions, in other words, whether the session generated later discussions about its topic. The second aspect is the perceptions of impact in their perspectives of gaming and reflective practices. The reason why the description of the outcomes is mostly based on their reports of impact is because the activity of writing an advert that was asked of them was not successful. This activity was designed to allow the researcher to compare the descriptions of games that students make before and after the course in order to check whether there were differences in how they do it. However, only three of the students who attended to the course wrote the advert, and for this reason this research method was abandoned for this course. The cause of this failure was assumed to be that the level of commitment needed to write the short advert in their free time was beyond the commitment they had for an extracurricular lunch break course of five sessions.

With regard to the experiences students had after the session was ended, there were some different reports. Christopher said he remembered talking about tangential learning with friends of his who were not doing the course; Jude said he continued to discuss with his peers after the session finished about the representation issues; Patrick and Adam separately declared they had discussed the topics amongst themselves between sessions; Oscar discussed one particular aspect of the second session with his father; Ewan said he used some of the ideas to justify his gaming practice to his parents:

I sometimes just kind of ask, like, my parents if I can play the Xbox, and then they say, no, you need to, like, do something else, and... because they all think it is bad for you. (...) Because they always say it is bad for you, it ruins your eyesight, whatever else they say, they make up some nonsense. [laughs] So I just kind of say points you came across in these sessions.

Henry also declared he talked with friends “quite a bit”, especially after the first session. Finally, only Harley said the topics were discussed only at the classroom.

The students’ views on the impact of the course were also diverse. Three students declared that they do not believe the course had an impact on their approach to gaming, for two different reasons. Adam and Oscar declared that they were already informed about the topics. Adam expressed it as follows:

I think I was already quite informed. (...) I think I have already made up my mind, really. (...) I didn’t get to know anything else. (...) I think I could guess most of it. Obviously I didn’t know the details... but I think I could tell in what I expected, really.

Oscar also declared to be informed, and he added that he frequently reflects about the influences of gaming:

I think for me [there was] no [impact], but for someone that is less observing, yes. Because I’d notice these things by, before, when I picked up the game. I played, and like: “oh it does that”, second time I play is just play for fun, but like some people just play for fun all the time.

The third student who denied any impact was Harley, for a different reason. He explained that “when I play games I just do it to have fun, I don’t really think about the game and what it is doing”. The teacher, when interviewed, also commented about some gamers of the school: the “big gamers” were invited to the course and preferred rather not to attend. He shared his belief that they

“weren’t really interested in talking about it, just like playing it”, an opinion that reminds me of Harley’s view.

The other five declared that the course had an impact, but their understanding of the impact differed. Henry emphasised that it does not change how he plays game, but changed his perspective on it. He also mentioned that it is helpful to know those things, and that he found out that “it is quite a lot more to gaming than originally thought”. Jude described a new way to play games which is more attentive to his cognitive processes, as was described in the section of the second session above. Patrick also described a new awareness, and a concern with excessive play:

Yes, probably has [changed the way he plays games]. I will now be more likely to think about these different things. Session two, it might make me, like, be curious of what the game is actually doing to me – with my cognitive functions. Or if I am getting slightly addicted to it, if so... stop playing too much.

Christopher and Ewan also considered that there was an impact, but they expressed it through the practice of tangential learning. The latter said “I looked slightly a little bit more stuff up sometimes”, and the former explained that “you learn more about the game by actually researching it and going more in depth towards the game as well”. Ewan also expressed his new perspective on gender representation, described in the section of the third session above.

In the anonymous online survey that I provided to students at the end of the interviews there were no answers. Hence apparently students had no strong urge to say anything that they did not feel comfortable to tell directly to me.

In summary, it seems that the impact of the course as a whole had some variations. One student regarded the topics of the course as irrelevant, two considered that they were already well informed – although they also expressed opinions that suggests that they found valuable and joyful to attend to the course – while five of them found some sort of impact, not necessarily in how they play games but mainly in their perspectives about gaming.

6.4 Discussion

This study offers partial answers to all my research questions. The findings from each session offered a glimpse of learners' experience in the RGC (RQ3 How is the Reflective Gaming Course experienced by learners?). And the findings regarding the interviews in particular outlined the outcomes of the course, for learners (RQ4 What are the outcomes of the Reflective Gaming Course for learners?). The findings regarding their prior knowledge and opinions also complement Study 1 on the understanding of the perspectives of players on the influences of gaming (RQ1. How do players understand the influences of their gaming practices?). Although most of the main research questions were touched on in this study, these answers were improved through the iteration (chapter 7). Thus, the next paragraphs offer the conclusions of this study, which were also the foundations for the improvements further investigated in the next study.

6.4.1 Session 1: "I immediately search about a topic if it is of interest" ***(Adam)***

The data of this study endorses the findings of the previous one to what concern tangential learning: whereas most participants of the first study had tangential learning experiences, in this study *all* students had concrete experiences that they were able to share; no one said he has never done tangential learning before. Moreover, the popularity of the topic also suggests that students value this practice. Even Adam, who represents the most sceptical student regarding all the other influences of gaming, shared with enthusiasm his tangential learning experiences. Also Harley, who was indifferent to the influences of gaming in general, seemed to enjoy the session and had tangential learning experiences to share. The possibility that some students made up previous experiences of tangential learning cannot be discarded, but an occasional exaggeration in this respect hardly denies its strong presence found in Study 1 and in this one.

It could be argued that it is pointless to address a topic with which students are already familiar, or which is already part of their gaming practice. However, if

we consider that the practice of tangential learning is positive for players, to address it is also to stimulate their curiosity to do it more frequently – especially if they are motivated to transform their gaming practice into something more positive for them. The data is suggestive of this stimulus to curiosity: Christopher and Evan stated this clearly and the former also commented about this with other friends; Henry seemed to appreciate finding out what his colleagues had to say about tangential learning, and even Adam, who claimed to “immediately search about a topic if it is of interest” declared that it was “good to consciously think about what you are doing”.

6.4.2 Session 2: “But that one was a more positive side” (Oscar)

A few students and the teacher also described that games are predominantly described as negative in other contexts; the positive aspects are hardly addressed. The findings, however, show that many students were able to mention positive influences of gaming in the online survey prior to the course. A tentative understanding of these contrasting data is that the predominance of ideas on the negative aspects of games does not prevent students from having occasional access to ideas related to the positive aspects, which often can be found on the media.

One of the most unique features of the ICEED Game Education Model in comparison with other models of the literature is the inclusion of the positive influences of gaming, and the self-reports indicate that they perceived the sessions on positive aspects of gaming the most valuable. Obviously, although in the interviews it was asked about the *most valuable* sessions, it would be naïve to assume that the feeling of having students’ gaming practices legitimated in the school did not influence their judgement of what was more valuable for them. However, it still suggests that students perceive more value in the sessions that are mostly ignored by game education proposals.

The data revealed potential issues with approaching the positive influences of gaming. The first one was that such ideas can be used to justify gaming practices, as Patrick stated that he had done with his parents before the course, and that Adam implied when he said, “It’s better to admit you are wasting time

for fun than attempting to justify your bad habits”. The aim of the course was not to equip learners with rationales to play more; in fact, in the course design this problem was countered by stimulating a critical approach to those claims and by dedicating one whole session on excessive gaming (that unfortunately, in this case, did not occur properly). The findings have showed that at the end of the course some students demonstrated some criticality regarding how to approach the claims of cognitive gains and problem solving, for instance when Oscar said: “I won’t develop many more skills if I continue to play the same game over and over again”, or when Jude said that he began to be more aware to his thoughts while playing games, which indicates an example of a reflective gaming practice. However, there is the risk that some students may have taken the ideas uncritically, which could fall in the simplicity of “gaming makes people smarter” that leads to the conclusion the more one plays, the better for her/him. This would be the opposite of the pedagogical aims of the course, and based on the data the possibility that some students ended up with such ideas cannot be rejected.

6.4.3 Session 3: “Is this crazy feminist woman? I hate her!” (Adam)

It not surprising that the negative aspects of gaming raised some resistance, but the particularities of it were surprising. The topic of aggression, which was mostly denied by participants of my first study, seemed to be received fairly well by the students of this study; perhaps they were influenced by the video in which Patrick Markey expresses a balanced perspective about the topic with the authority of a researcher. Also, in their survey answers violence had already appeared. Students seemed to accept that violence in games is an issue despite occasional exaggeration and oversimplification of some mediums. When Jude described his own experience of breaking up the video game controls, the discussion that followed suggested they were open to discuss about aggression in an honest manner rather than a defensive one. Their prior answers in the online survey also suggested that they see claims of negative influences of gaming as more valid than the participants of my first study, who essentially denied everything negative but excessive play. Brenick et al. (2007) found that high engagement with games was related to less awareness of

potential negative influences of gaming, and it mirrors the apparent higher receptivity to the negative influences from this group than the ones interviewed in the previous study.

The topic regarding problematic representations of race in games did not seem to raise much debate. It seemed mostly consensual that such representations are a problem; Adam was the only one to express otherwise, and he found resistance amongst students. Perhaps the presence of two people in the classroom who were possibly not perceived as white (i.e. myself and one student) prevented students to manifest racist discourse. The study of Rodriguez-Hoyos and Albuquerque (2014) found more frequent opinions defending that claims on racism in games are exaggerated or irrelevant, and it might be due to the fact they looked at online forums, i.e. a context in which players would be less exposed when making racist statements. Of course, the design of the course itself was biased, because the topic of race representation was less emphasised than gender and violence, and it can be predicted that going deeper in this topic could also raise more resistance against the ideas that representations of race are often problematic.

The topic of gender, however, found the most explicit and emotional resistance. It cannot be ignored that everyone in the classroom was male. Moreover, the videos of Anita Sarkeesian are notorious for their capacity to provoke intense reactions, and it was not different in this study. All that considered, tackling this problem seemed to unveil problematic understandings of the topic that were expressed in the classroom, such as exception arguments (i.e. mention exceptional examples of representation of women, such as Lara Croft, to counter the claim of a systemic problem of representation) marketing arguments (e.g. it's what the consumers want, or the consumers are mostly male), fiction arguments (e.g. it is just fiction; it has no consequences to "real life"), and arguments on equalised sexism (e.g. sexism goes both ways, hence we should not be more concerned with women than we are with men). These findings suggest that addressing the topics of problematic representations of gender and race is needed, because players are not familiar with a critical view

on games, even though some of them believe they are aware, i.e. they think they had discussed the topic enough.

The fact that some students found the topic irrelevant or that it did not deserve one whole session just reinforced this need: it is arguable that it is more fruitful to promote a rich debate about gender representation (which finds resistance, disagreement, ingrained misconceptions, and sometimes the feeling that they “already knew it”) than to have a group of students bowing in agreement about the existence of issues regarding violence and excessive gaming (which they are already told by parents, media, etc.). It is worrying that when faced with those problems students sometimes hold beliefs that those representations have little influence on players, as was also found by Brenick et al. (2007). The lack of a critical awareness of gender and race representation in games was found in Study 1, in the current one and also by Madill and Sanford (2007). As they suggest, perhaps the activity of gaming allows little opportunity for such kind of critical analysis, and it normally is not addressed by parents, teachers, and neither spontaneously amongst players. Williamson and Facer (2004) also described player conversations, and there was no evidence pointing towards critical reflections. These conclusions reinforce the stances defended by critical (Kincheloe, 2008) and feminist (hooks, 1994) educationists, in which race and gender should be further discussed in schools.

The findings did not only highlight the need to approach the topic, but also showed that some result is possible. Whereas there is no evidence that many students changed their prior beliefs regarding women’s representation, some declarations suggested that some of them appreciated the chance to address the topic and see things through a different perspective, which was not shown to them before. The study of Sanford and Madill (2007), which expected critical literacy regarding gender values in games to emerge naturally from game creation activities, found that although game creation seemed to develop other literacy aspects, very little evidence of critical literacy was found. There is no reason to conjecture that other game education practices promoted more reflection on those topics than this one: Klimmt (2009) briefly mentions stereotypes and exemplifies it through race stereotypes; Newman and Oram

(2006) and Apperley and Beavis (2014) mention gender representation as a small detail within bigger pictures of topics, seeming almost accidental. In Buckingham and Burn (2007), their description of the game created by students based on Vladimir Propp's typology of characters depicts precisely the trope of the damsel in distress, and the report does not problematize it.

Clearly, the presence and the meaning of a critical awareness of games are contentious topics. And whereas gender and race representation seems to receive little attention from game education proposals, this study reinforces the need that Sanford and Madill describe of addressing those. Contrastingly to their study, I tackled the topics directly and perhaps therefore had more significant outcomes on critical awareness of race and gender.

6.4.5 Session 5: “Not many people say they want to go around like creating video games” (Ewan)

The data regarding the session on game creation suggests that it was perceived as the least valuable of all. Some commented that the topic is not relevant to all students because game creation do not interest the majority of them. However, even the ones who clearly had engaged in creative practices saw little value on the session. It is arguable that the problem of the session was not the topic of game creation, but that it was just poorly designed and/or implemented, which is not discarded. To this thesis, however, this study seems conclusively to say that the approach that was taken was unlikely to offer valuable experiences for students.

The obvious alternative approach to game creation is to allow students to create their own games instead of just talking about it, as was previously investigated by many authors (e.g. Buckingham and Burn, 2007; Burn and Durran, 2007; Madill and Sanford, 2007; Cruz et al., 2012; Albuquerque and Cruz, 2013). The possibility of integrating game creation in the Reflective Gaming Course would possibly add more hours to the course than its whole current duration, and require extra resources (e.g. software). Also, if game creation was undertaken by introducing game creation practices that are unfamiliar to the students it would differ from the dialogic principle as is

described in ICEED because the practices would not relate directly to the gaming practices of students. Of course, the extent to which game creation relates to game practice of students varies according to the game creation strategies and game practice of students; some game creation strategies probably will feel more familiar to students than others. Also, if the game creation tools are not easily available for students (e.g. paid software), the course would not really be particularly empowering, because students would find difficult to act in their regular gaming practices in accordance with the course. Considering the points above, I decided that the project would exclude the game creation topic from the course in the following iteration.

6.4.6 Research problems

The study had many problems that limited its possibility to answer the research questions satisfactorily, that also urged for an improved iteration.

The first difficulty was the absence of a second observer, which would be desirable to offer me another account of what went on. Thus the observation data was generated solely by me while I was also implementing the course. It raises an issue of cognitive overload due to the difficulty to undertake both activities simultaneously. Furthermore, the limitation of having only one perspective on the events, especially when it is the perspective of someone who was as immersed as myself in the research project, offers a strong bias. During the analysis of the data, the observations were matched with the other sources of data (e.g. online surveys) to avoid taking conclusions based only on my own impressions. However, the potential of matching my observation with the observations of another was not achieved.

The second difficulty was the activity in which students were asked to write adverts of one of their favourite games; one before the course, and one afterwards. The research plan was to compare them in order to assess whether the manner that they described their favourite games changed in any way, i.e. whether they incorporated elements from the course. However, only a few students wrote the adverts before the course, and it was decided that the method would be abandoned. Therefore, the only data available to discuss the

impact of the course to the students was their self-reports. A new plan to assess how students express themselves regarding games was needed for the next iteration.

The third difficulty was the impossibility of implementing the fourth session. The unexpected events at the school created a gap in the data regarding the session on excessive gaming.

The fourth difficulty was the implementation of the group interview at the end of the course. It is still not clear whether students needed more time or support, or the idea of improving the course plan was beyond what they were prepared to do. In either case, the data from the group interview added very little to the study.

There were other minor difficulties. Not all games were unblocked from the school server, but enough of them were. Sometimes some students would arrive a little late, or some students would spend time to call another who had forgotten about the course. In the activities that students had to write anything down, only a few would actually engage in writing. Some small group discussions became spontaneously whole group discussion, probably due to the small size of the whole group.

6.4.7 General remarks

Despite the difficulties, the study represented a big step towards answering my research questions. In summary, a course was designed according to the ICEED Game Education Model and was implemented with some positive results. A rich profile of the reactions of students – with their opinions, beliefs and personal experiences – was generated, which raised several questions for reflection, improvement, discussion, and inspiration. Finally, the students and the school teacher seemed to appreciate and approve of the course, most of them stated they believed in some impact from the course on their gaming practices or perspectives, and perceived the experience as the first opportunity they had to properly discuss many topics they find relevant.

Although there were problems, I do not think those prevented the study from generating relevant knowledge, but they did limit the quality of the data. Also, the experience of offering the course in one specific context raises questions on which outcomes were very particular to that group, and which outcomes are shared between more than one experience – which would make them slightly more reliable as guides for future initiatives. All the above motivated the next iteration of the course, which ideally would be superior in terms of both pedagogy and research. At the end I was, obviously, much more prepared to implement and research the Reflective Gaming Course than I was in the beginning. This practice also played the role of my training on my own proposal of reflective gaming education.

7. STUDY 3: ITERATING THE REFLECTIVE GAMING COURSE

7.1 Introduction

This study is based on an improved version of the RGC. The lessons learnt from Study 2 were incorporated in the new version of the RGC, with the aim of improving both research methods and pedagogical strategies. The implementation of an iteration of the designed artefact is expected from a project following a Design Based Research methodological approach.

The aim of this study was to deepen the answer to the third research question (How is the Reflective Gaming Course experienced by learners?) and fourth (What are the outcomes of the Reflective Gaming Course for learners?). Therefore, it was designed to complement Study 2 in understanding the learners' experience in the RGC, and its outcomes.

7.2 Improving the Reflective Gaming Course

One of the improvements of the course was in my own capacity to lead the RGC. My experience implementing Study 2 helped to build up my confidence and become familiarised with the teaching practice of the course. In addition to that, many minor specific changes were made to every session.

7.2.1 Session 1: Tangential learning

The first session seemed to work well and be very popular, thus the modifications were minor. They were:

Table 4: Changes of the first session

Change description	Rationale
In the original introduction students were asked to share the names of some of their favourite games in addition to their names and what they had learnt with games. In the new version the	This activity was modified to expand the initial presentation of students, adding their favourite games

<p>question was done before the video about tangential learning, therefore at this point the question addressed learning in a broad sense rather than tangential learning.</p>	<p>in the discussion. It aimed to extend the initial ice breaking activity and raise some preliminary ideas about games and learning.</p>
<p>After students watched the video about tangential learning, they were asked to share their experiences about the topic, including the game title and what was learnt. The change was in the discussion afterwards, in which the tutor asked about whether they could see a pattern in the examples, i.e. most examples were historical/mythological, and the group tried to find examples that did not fit in the pattern, expanding the possibilities of tangential learning.</p>	<p>This change aimed to involve more input from students in the expansion of ideas of tangential learning. After the many examples of tangential learning from Study 1 and Study 2, it was likely that the pattern would repeat in Study 3 and the first ideas would be based on historical and mythological elements.</p>
<p>The activity of implementing tangential learning in the classroom became optional, depending on how students reacted to the generation of new ideas of topics to search. If this activity were not included, it would be replaced by the extra material (see below).</p>	<p>Because students struggled to find new topics to search in the classroom in Study 2, I was not sure whether it was a good idea to maintain this activity of conducting tangential learning in the classroom. However, it also seemed positive to engage students in a variety of activities instead of being solely on discussions. For this reason, the activity was kept, but an alternative plan</p>

	was designed.
<p>In the discussion after the video, new material was added to feed the discussion, in addition to the questions on whether tangential learning changes the gaming experience. Depending on the direction of the discussion, the following points would feed the discussion: (i) the advice that some game designers should appreciate a wide range of cultural experiences, including literature, theatre, cinema, etc., and that those references can appear in the game design; (ii) the idea of students making connections between elements from games and elements from formal learning, as investigated in Study 1; (iii) the quote from Squire (2011):</p> <p><i>Civ</i> [making reference to the game series “Sid Meier’s Civilization”] tied together themes from geography, economics, politics, and history, enabling me to identify holes in my understanding, such as, “What was happening in sub-Saharan Africa during the Roman Empire?” These connective questions come naturally to a <i>Civ</i> player but are rarely interrogated when topics are presented separately in school. (p. 20)</p>	<p>The materials (i) and (ii) linked the idea of tangential learning with the understanding of games as cultural artefacts, an idea that is present both in media education in general (Buckingham, 2003) and in some proposals of game education, such as Buckingham and Burn (2007). The material (iii) aimed to stimulate students to reflect on whether the benefits of gaming come automatically or it depends on how the player engages with the game. It was a response to the findings from Study 2, which suggested that some students ended up with a naïve or overoptimistic perspective on the influences of gaming.</p>

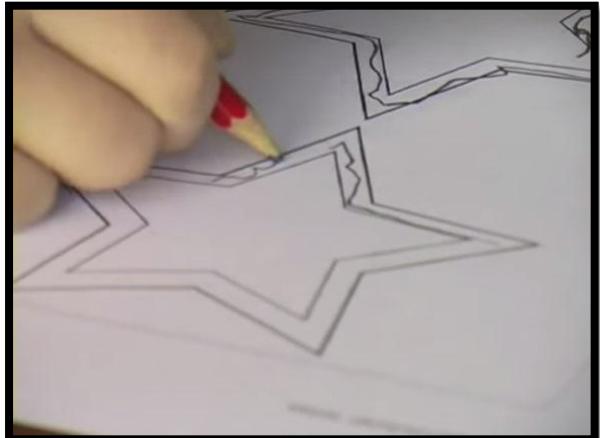
In conclusion, the most relevant change was the possibility of replacing the main activity of the session by an expansion of the discussion about the theme. However, it was not defined *a priori* whether the replacement would occur, it depended on the students.

7.2.2 Session 2: Cognitive gains

Some modifications were added to the second session, aiming to promote a more critical perspective.

Table 5: Changes of the second session

Change description	Rationale
<p>The exercise of reflecting about the practical use of each skill potentially developed by gaming was more explicitly explained. It was done through drawing a table with the whole group, using their examples, that relates game title, skill developed and context of use. Only after this exercise in the group students were asked to apply the same reasoning by themselves in the next exercises.</p>	<p>It aimed to support students to relate cognitive and problem solving skills to practical contexts, because in Study 2 they struggled with that.</p>
<p>Instead of asking students to decide which game to play, the tutor split the classroom, each part playing a different game. After playing, one voluntary student from each group was called to make a quick demonstration of the game he played to the other half of the classroom.</p>	<p>In Study 2 students were confused about the game to play, and ended up playing both. The new way to organise the activity was designed to maximise the time that the games could be played, and the demonstration by a volunteer was aimed to be an icebreaking activity.</p>
<p>The gaming session was split into two sessions. The</p>	<p>It was split to allow</p>

<p>first gaming session asked students to play the games Portal: the Flash Game (We Create Stuff, 2007) and Solipskier (Mikengreg, 2010). It was followed by discussion and analysis, then, the second gaming session. In other words, instead of having a long discussion followed by a long gaming session, it became intercalated: short introductory discussion, short gaming session, short discussion problematizing the topic, another short gaming session.</p>	<p>them to gradually incorporate aspects in their game analysis instead of having long discussion blocks.</p>
<p>After the discussion about the first games, the video <i>Are games good for you</i> (Science.tv, 2008) was used to expand the topic. It has only 58 seconds and shows school students making a simple experiment to investigate whether playing games improves hands-eye coordination. The classroom then was asked about the limitations of their experiment, in order to illustrate some difficulties when researching this sort of topic.</p>	<p>It aimed to problematize the claims regarding cognitive gains and problem solving skills developed by gaming. It was due to the suggestion of Study 2 that some students ended up with an overly optimistic perspective about these influences.</p>
	
<p>Figure 9: Screenshot of the video “Are games good for you” (Science.tv, 2008)</p>	

<p>they were asked to play one more game: Auditorium (Cipher Prime, 2008). They should also analyse one of their favourite games in addition to the game Auditorium.</p>	<p>analysis of one of their favourite games follows the dialogical principle of the ICEED model, which encourages students to relate the discussed topics directly with their gaming practices.</p>
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In summary, adjustments were made to support students to relate games with other activities, in particular their favourite games, the gaming session was split in two, and an activity that problematizes research in the field was added.

7.2.3 Session 3: *Representation problems*

The third session had materials added to complement its former version.

Table 6: Changes of the third session

Change description	Rationale
<p>Instead of asking students to write down in pieces of paper the titles of their favourite games and their protagonists, students were asked to write it on the whiteboard while they were arriving in the classroom and were waiting for the beginning of the session.</p>	<p>It made the activity more social, allowing for sharing of the game titles/protagonists, which generated informal conversations and kept students entertained while they waited.</p>
<p>The study of Unsworth and colleagues (2007) was explained by the tutor in a simplified manner. The study found that some personal traits are related to different reactions to</p>	<p>This paper was added to enrich the discussion about games and violence, giving a glimpse about the complexity</p>

violent games, where some players get more aggressive, less aggressive or are not affected.	it involves.
The video <i>Gaming and Productivity</i> (Big Think, 2012) was removed.	The message of the video was not deeply related to the other topics of the session.
<p>To introduce the matter of stereotypes, the simple question “Do stereotypes have an effect on how we see the world?” was replaced by a quote from the article from Hsu (2009):</p> <p>Results proved eerily similar to that of an earlier study of television characters, which showed 82.9 per cent white, 2.6 per cent Latino, 11.4 per cent black and 2.6 per cent Asian characters. Both video game and television characters seriously underrepresented Latinos and Native Americans compared to the actual U.S. population, as well as children and the elderly. (...) However, only video games showed a far greater imbalance for females, who made up just 15 per cent of video game characters. (...) Only African Americans proved the exception to this, given their relatively high representation among video game characters compared to video game developers. But their numbers dropped steeply outside of virtual athletes in sports</p>	This activity was designed to begin the conversation about stereotypes departing from a more informed position instead of an assumption that stereotypes occur. It also made clear an important difference between lack of representation and stereotyped representation.

games, with many remaining characters representing gangsters and street people in games such as "Grand Theft Auto" and "50 Cent Bulletproof." (...) "If I was African American, I'd be displeased with the poor quality of my portrayals," Williams said. "If I was Hispanic, I'd be displeased with my lack of portrayal." (...)

This quote was used as an inspiration to discuss the following questions, in small groups: "Why do you think these problems happen? Does it really happen, in your experience? And what are your thoughts about the topic?".

In the discussion about sexism after the video with Anita Sarkeesian, the tutor had new input to feed the discussion: (i) the study implemented by Dill and colleagues (2008), which found that exposure to sexualised images changed posterior judgements about sexual harassment, and (ii) the idea of the *Bechdel test*, and the reflection about an analogous test for games.

The materials aimed to highlight two aspects of the discussion that students from Study 2 seemed to struggle: the material (i) suggests that representation has concrete influence on players, even though not necessarily consciously, and the material (ii) stimulates a reflection about the role that characters have on the plot, in addition to the lack of representation and stereotyped representation.

In summary, this session had material added to further inform the classroom discussions.

7.2.4 Session 4: Excessive gaming

This session did not occur properly in the previous iteration, so there was little feedback about it. However, some changes were made based on insights about the course as a whole.

Table 7: Changes of the fourth session

Change description	Rationale
While students were arriving in the classroom, they were asked to write down in the blackboard the name of some games that they consider very compelling. These games were used later to reflect about the elements of games that make them compelling.	The activity of writing the names of games in the whiteboard worked well in session 3. Also, to use their favourite games as a foundation to discuss the compelling elements of games was consistent with the dialogical principle of the ICEED model.
The video <i>Caught in the Web - Addicted to gaming</i> (BBC, 2010) was removed from the plan.	The course review added to this session made it too long, and this video had a small contribution when compared to the other one.
A short description of the study of Skoric and colleagues (2009) by the tutor was added. The authors differentiate high engagement with games from addictive behaviour and found that only the latter was related to poor academic performance of students.	It aimed to complement the video <i>Game addiction (part 1)</i> (Extra Credits, 2010), presenting an academic perspective that uses the term “addiction” while expanding the understanding of its influences.
A 40 seconds video that shows the preliminary version of an app	It aimed to inspire students to think

<p>proposed by Kamphorst (2011) that was designed to support self-regulation in gaming was added, in order to encourage reflections about strategies of self-regulation.</p>	<p>about self-regulation strategies.</p>
<p>The Forbes article of Tassi (2014) about the game Clicker Heroes (Playsaurus, 2014) and its compelling quality was added. Not to be read but to be commented upon.</p>	<p>The game Clicker Heroes (Playsaurus, 2014) was an example of a game that became popular with a very simple game structure based mostly in an increasingly rewarding system. Because the game did not work on the school computers, it was only described as an example.</p>
<p>The games to be played were reduced to only one, the 3rd World Farmer (Arcade Town, 2006).</p>	<p>Other games did not work in the college computers/server, and the inclusion of the course review in this session made it shorter.</p>
<p>The review of the whole course was added to this session. Students were asked to analyse in small groups the 3rd World Farmer game and one of their favourite games, using all the topics covered by the course.</p>	<p>This had to be done in this session because this session became the last one. The analysis of games using all topics covered aimed to encourage a complete vision on how the course could change their perspectives on gaming and games.</p>

In summary, one video was excluded, and a journal paper, an article, another two videos were added. The course review was also added.

7.2.5 Session 5: Game creation

This session was completely removed, thus the present iteration had only four sessions, not five.

7.3 Research methods

The research methods of this study were essentially a refined version of the research methods of Study 2.

7.3.1 Settings

This study was implemented in a college, not in a school like in Study 2. It is a Sixth Form College in Nottinghamshire. A media teacher was interested to support the research project in the College, and in meetings with her we decided to offer the RGC as an option in their regular period for extracurricular activities called Enrichment Sessions. The four sessions occurred once a week, in one-hour slots. Emails inviting students studying A-levels in Media, Psychology and ICT were sent, and the teacher also talked to individuals in person about the RGC. Although the media teacher helped to arrange the course, she was not present during the sessions.

I offered 20 places in the course on a first-come first-served basis, but coincidentally there were precisely 20 students who demonstrated interest. Three of them were female students, and they came to the interviews prior to the course, but did not turn up to the course. Also, three male students did not even attend the initial interviews. Consequently, there were 14 male students who actually participated in the course, aged between 16 and 18. All students who participated in the two interviews received a £10 voucher as an inconvenience allowance.

On average, students reported to play approximately 17.9 hours per week in term times (ranging from 2 to 42), which is higher than the average of the participants of Study 2 (11.3 hours). Also, they reported to play 29 hours per week during holiday time, on average (ranging from 10 to 60).

7.3.2 Observations

In addition to my own observations, in this study there was an external observer. The external observer is a trained teacher, is an educational researcher and has some experience with the English educational system, both

as a student and as a teacher. He was asked to observe the four sessions of the RGC. He was asked to register the ideas that emerged in the classroom (as questions, personal experiences, opinions, etc.), as well as the response of students to the activities proposed (i.e. whether and how they engaged in the activities). He was also asked to record which student made each comment in the classroom, using codes for students – he had no access to their names. The external observer also made suggestions and reflections on how to improve the course, and these were welcome and were particularly valuable due to his experience as a teacher.

The presence of the observer aimed to offer a different perspective of what occurred in the classroom, which comes from someone who is not immersed in the research project, therefore allowing me to have insight about my own biases. His presence also allowed me to know who (i.e. which student) made each comment in the classroom, and offered suggestions to the RGC.

After taking notes in the classroom, the external observer wrote reports. We also orally exchanged our impressions after each session. The sessions were also audio-recorded. Using his reports and the audio from the sessions as basis, my own report of each session was written. Our observations aimed to generate an account of what occurred in the classroom, focusing on the ideas that were expressed and the interaction between the activities proposed and the students.

7.3.3 Interviews

The interviews with students had two different goals. The first goal was to investigate any outcomes of the RGC by comparing the changes in students' discourse about games after the course. In order to assess it, each student was interviewed individually twice. Once before the course, and again after the course had ended. The interview questions were preceded by a gaming session, in which students had the chance to play two games for approximately ten minutes each, and they answered questions about the game after playing each one.

The aim of this procedure was to allow them to share their opinions about particular games (in contrast to opinions about games in general) before and after the course, and by comparing them, understand how their opinions incorporated ideas from the course. The two games that were played both before and after the course were the following:



Figure 10: Screenshot of Rock of Ages in a gameplay context.

Rock of Ages (Atlus, 2011) is a tower defence game in which the player controls the ball that has to overcome the defences of the opponent, in addition to create her/his own defences. The narrative involves Sisyphus, the character from Greek mythology who was condemned by the Gods to push a boulder up the hill and see it falling down repeatedly, for eternity. In the game, Sisyphus rebels against the Greek God Chronos, and after defeating him Sisyphus engages in an odyssey through European history, fighting different historical figures such as Leonidas and Napoleon. The characters are depicted according to famous representation in art history, which in some cases is coherent with the period of the historical figure – e.g. Napoleon is depicted as in his contemporary portrait *Napoleon Crossing the Alps*, by Jacques-Louis David. After playing, students were also asked to observe the other characters available, and choose the one they would like to play in a future game. This activity aimed to create a context for students to pay attention to the characters

instead of observing them purposelessly. The characters they chose are irrelevant to the research.

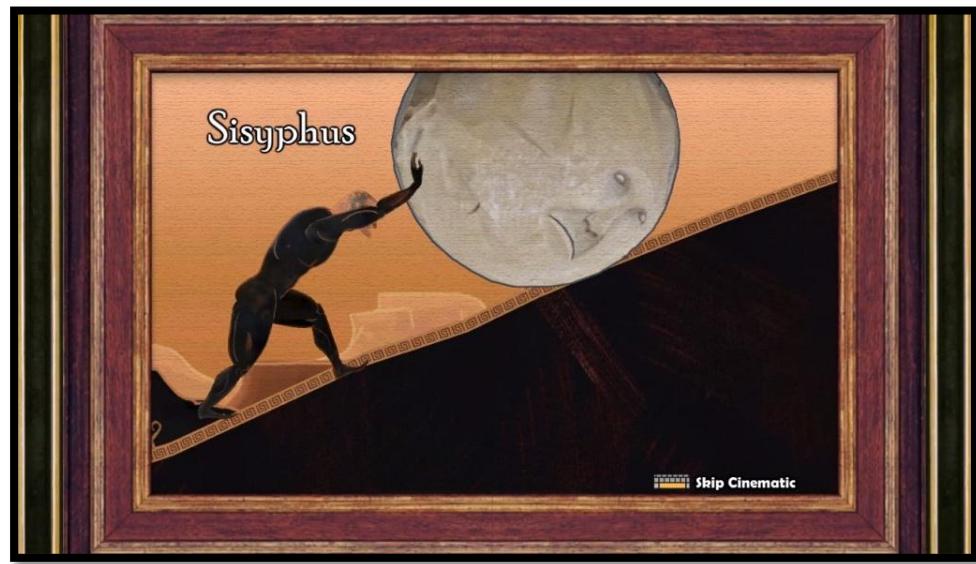


Figure 11: Screenshot of cinematic of Rock of Ages, introducing the protagonist

The reasons why the game was chosen are as follows:

- It is appropriate for their age, with the PEGI (Pan European Game Information) rating of 12 years old.
- There are many historical references that could be searched and therefore it had the potential to trigger comments about the topic covered in the Session 1 (about tangential learning). These references are also present in other media (e.g. films)
- To play the game the player has to use motor skills, think strategically and react quickly to events. Therefore it had the potential to trigger comments about the topics covered in the Session 2 (about cognition and problem solving).
- There is some animated violence in the game, and violence is the only solution available for the player to overcome the challenges of the game. Therefore it had the potential to trigger comments about violence, discussed in the Session 3 (about problems of representation).

- The game has 20 characters, with Marie Antoinette as the only female character. Although the ethnicity of some characters is undefined (such as Sisyphus, who is depicted in an ancient Greek vase painting style, or the Plague, which is not human), all characters with a clear ethnicity are white. Therefore it had the potential to trigger comments about the lack of diversity of race and gender, which was commented in Session 3 (about problems of representation).
- As practically any other game, this game could be analysed in terms of its compelling elements. Therefore it had the potential to trigger comments about the topics covered in Session 4 (about the compelling elements of games).

In summary, this game offers material to discuss any of the main topics covered in the RGC, whereas the most evident elements are the historical references, which are employed in a unique way when compared to other games with historical references.

The second game was Tales of Monkey Island (LucasArts, 2009), which is a graphic, point and click, puzzle based, adventure game, in which the player controls the pirate Guybrush Threepwood in an adventure in the Monkey Island to save the world from LeChuck, an evil undead pirate. The gameplay is based on solving puzzles using a point and click mechanic, in many cases by selecting which items to mix in order to create new items, and there is a central role of the narrative. The scene that students had the chance to play consists in the first scene of the game, when the antagonist LeChuck is in a boat trying to use voodoo magic to some evil purpose, while Elaine, the protagonist's wife, begins the game captive. Guybrush, the protagonist, comes from a different boat, and has to find a way to access LeChuck's boat and use a voodoo recipe to interrupt LeChuck's magic and save Elaine.



Figure 12: Screenshot of Tales of Monkey Island, during a dispute between Guybrush and LeChuck.

The reasons why this game was selected were:

- It is appropriate for their age, with the PEGI (Pan European Game Information) rating of 12 years old.
- Although the game is mostly fictional, it makes reference to a historical topic, the pirate activities in the Caribbean islands, as well as a mythological figure (undead), amongst other subtle references. These references are also present in other media (e.g. films). Players can potentially search for information about those; therefore it had the potential to trigger comments about the topic covered in the Session 1 (about tangential learning).
- It is a game based on puzzle solving, which could generate reflections of students about the problem solving skills that players have to use in the game. Therefore it had the potential to trigger comments about the topics covered in the Session 2 (about cognition and problem solving).
- Despite the kidnapping theme in the first scene that contains some animated violence, most of the game focuses on solving non-violent puzzles. Therefore it had the potential to trigger comments about violence, discussed in the Session 3 (about problems of representation).

- The first scene of the game is based on the male protagonist saving the female side character from the male antagonist. It clearly shows a “damsel in distress” gender stereotype that was covered in the Session 3 (about problems of representation), and therefore could generate comments with this regard. It is not to affirm that the game is sexism as a whole. Although there are at least three scenes throughout the game when Elaine performs the role of damsel in distress, one could argue that the game is satirical to the tropes it employs. However, this study uses the first scene of the game because it clearly employs the trope, and it should not be interpreted as a conclusive gender analysis of the game or series.
- The first scene of the game also depicts the antagonist as a zombie and using “voodoo magic” to accomplish his evil purposes. It could trigger comments about the negative representation of one of the most stigmatised religions with African roots, which is mistakenly associated with the creation of zombies. Therefore it had the potential to trigger comments about the representation of race, which was commented in Session 3 (about problems of representation). The fact that, at least in the first scene, all characters are white despite the fact that the story happens in the Caribbean islands could also trigger a comment on the lack of non-white characters.
- As essentially any other game, this game could be analysed in terms of its compelling elements. Therefore it had the potential to trigger comments about the topics covered in Session 4 (about the compelling elements of games).

It could be said that the main aspect of this game was to offer a context in which a gender stereotype (Session 3) was evident. However, it could be analysed essentially by all the main topics covered in the RGC.



Figure 13: Screenshot of Tales of Monkey Island, captive Elaine.

After playing each one of the games, students answered some questions about the games. The questions were designed to create opportunities for students to talk about the games in terms of the influences of gaming, in particular the topics covered in the course. However, the questions were open enough in order to allow students to completely ignore the influences of gaming. In other words, the questions would encourage reflection about the influences of gaming only in case students take into account the influences of gaming when thinking and talking about the games. The questions were:

- Do you play games such as this one?
- What do you think are the good things about this game?
- What do you think are the bad things about this game?
- What do you think about the main characters?
- What do you think about the experiences the game provides for you?
- Imagine a parent was unsure about buying this game for a 12 years old child. What would tell them about this game to help them make a decision?
- Imagine a parent was worried their 12 years old child was spending too much time playing computer games. Could you give them any advice about playing this game?

The second goal of the interviews is similar to the one implemented in Study 2. It was intended to allow students to express their opinions, criticism and suggestions about the course, as well as they perceptions of the outcomes of the course. It is relevant, in a critical perspective of educational research, to hear students' voices about the course. With these regards, students were asked the following questions after the course:

- Thinking back on the course as a whole, what did you learn about games and learning?
- Again considering the course as a whole, do you think it has made you think differently about games and gaming?
- Do you think courses like this should be offered in schools and colleges in the future?
- How do you think this course could be better?

The questions above were followed by questions about their profile as players:

- How old are you?
- How many hours do you estimate you normally play digital games during school terms?
- How many hours do you estimate you normally play digital games between school terms?
- What are your favourite game genres?
- What are your favourite games?

The questions of all interviews were not read, therefore the phrasing had some variation. The follow up questions also differed according to the answers given by the students.

7.3.4 Surveys

A survey was administered to students at the end of each session, as in Study 2. It aimed to complement other sources of data, capturing something of students' immediate responses to the session. However, differently from Study 2, in the current study some questions were designed to fit all sessions, instead of having specific questions for each session. This strategy aimed to be more

consistent throughout the course and less likely to lead students to answer according to pre-conceived ideas about what the sessions were about, thus allowing for more spontaneous answers to emerge. The questionnaire format was based on the one used in Study 1, offering statements, to which students could respond on a Likert scale of how much they agreed, and then asking students to explain their responses. The Likert scale aimed to support students to take a stance about the topic, and allowed the researcher to compare different answers using a unified scale. The statements were:

- “I learnt something about games and gaming during this session”
- “This session has made me think differently about games and gaming”

The two questions address two aspects of the course: what was learnt, and the ways that attending to the course changes students’ perspectives. There was an extra question at the end asking for suggestions to improve the session. Furthermore, students were asked to answer in paper rather than online.

The questions used in the interviews and surveys can be found in the Appendices 5 and 6, which are, respectively, interview questions and survey questions.

7.3.5 Data analysis and presentation

Similarly to Study 2, the interview data was coded using the themes of the course, namely, tangential learning, cognitive gains, violence, gender and race representation, and excessive gaming. In the data analysis process the data was structured in different manners. The first step was to group interview data from the first interview with data from the second interview for each student, hence allowing me to easily compare initial perspectives of each student about each topic with his final perspective. When complemented with the survey answers divided by student, it allowed me to draw the participation profile of each student. It allowed me to deepen my familiarity with the data by understanding the participation of each student in the course. However, the findings were not presented following a student-based structure.

In order to describe the findings to the reader, interview data from the initial interviews were grouped by topic in order to formulate a view of the pool of initial ideas prior to the course, for each topic. It directly supported the writing of the sections called *Prior perspectives of students*. The same process was undertaken with the data from the last interviews. That, complemented by the survey, allowed me to draw the profile of students' perspectives after the course, which supported the writing of the sections called *Outcomes of the session*. My report of the session, which incorporated the report of the external observer, was used as a basis to write the sections called *Classroom interactions*. Notes were taken to remind me when a source of data informed a different section from what I have just described. For instance, when something described in my reports informed the prior perspectives of students instead of the classroom interactions.

In the survey questions that students had to answer in a Likert scale, the mean was generated by allocating values for answers. In this case, *strongly agree* was 5, *agree* was 4, and so forth. Surveys without answers were ignored. This transformation of data from an ordinal scale (i.e. Likert) to an interval one is not accurate; as it assumes that the intervals between answers are regular, hence creating an arbitrary distortion to the data. However, it is useful as a parameter to rank the sessions as long as the reader keeps in mind this bias. This method allowed the researcher to have a *vague* notion of which sessions were perceived more or less positively, and characterises a minor detail in the findings.

In the presentation of findings, only those concerning students who attended to that specific session were described. Some exceptional cases of students having insights regarding topics from sessions they did not attend were added, and they were clearly indicated. Also, the names used are pseudonyms.

It can be noted that in this study more details are given about the classroom interactions, if compared to Study 2. It is due to the fact that the superior quality of data generated in this study in comparison with the previous one, as well as the superior conditions (e.g. more students, I was able to carry out all

sessions). For these two reasons this study better illustrates the details of the classroom interactions, thus they are presented with more detail.

7.3 Findings

The findings are presented divided by session, and each session is divided in three sections: (i) Prior perspectives of student (ii) Classroom interactions, and (iii) Outcomes of the session. As it is easily perceived, it follows an order such as: before, during, and after the course. In the end of the Findings there is a section that presents points of view regarding the course as a whole.

7.3.1 Games as learning stimuli: curious gaming?

The session consisted of an introduction to the course, a video explaining what tangential learning is, exchanges of students' previous experiences of tangential learning, an exercise to expand the possibilities of tangential learning and finally the experience of conducting tangential learning in the classroom. The latter was, however, optional, possibly being replaced by an expansion of the discussion about games as cultural artefacts, depending on the students. All the 14 students attended the first session.

7.3.1.1 Prior perspectives of students

In the interviews prior to the course, some ideas about tangential learning and learning in general were expressed. It could be argued that the historical references in the game Rock of Ages (Atlus, 2011) are evident, and four students (David, Samuel, Joseph, Harry) mentioned the potential of the game to trigger tangential learning, illustrated by this quote of David: "things like this are kind of like spark the interest. Like, 'oh, who is Leonidas? Is he a real person?' So it'd probably, like, intrigue the player 'oh, what's this?' So I'd go and research it. Like, outside of the game". It also means that ten students did not talk about tangential learning, even when asked about positive elements of the game, asked to share an opinion about the characters (all historical or mythological), and to give advice to parents on whether it would be a good idea to purchase the game for a 12 years old child. Three students did appreciate the historical references of the game, perceiving it as a positive

element, but when asked to explain it the historical references were considered original (Andrew), comedic (Charles) or joyful to a history enthusiast (Nathan), but the idea of tangential learning did not occur to them. The game Tales of Monkey Island (LucasArts, 2009) did not trigger any comments about tangential learning.

There were also ideas regarding learning through playing Rock of Ages. On the one hand, James and Charles mentioned the possibility of learning about the names of historical characters, with some scepticism. On the other hand, Aidan, Joseph and David seemed to be more enthusiastic about the learning potential of playing the game. David said that “you probably learn quite a bit, like, from history”, whereas Aidan described it further:

It teaches you about elements of ancient Greece. Historical figures and basic history and geography of Greece. (...) Since it does introduce some Greek mythological and actual historical things it's pretty good from an educational standpoint.

The other nine students did not show any belief that learners would learn anything valuable by playing the game. In the first session students were asked to tell their names, one or two of their favourite games, and what they thought they had learnt with games, if anything. The twelve answers were divided between the seven related to problem solving skills (related to the second session) and the five related to factual or conceptual knowledge acquisition (related to this session). The latter were vocabulary (Andrew and James), the game market (Joseph), strategic manoeuvres used in battles, both historical and contemporary (Nathan) and places and location (Samuel). The complete table with their answers is available in the description of the second session.

The idea of players perceiving connections between game elements and classroom topics also emerged, even though they were not directly asked about this. James mentioned that playing Rock of Ages (Atlus, 2011) could facilitate future learning: “if people would know the name before they start learning that in school, it would help them”. Harry also briefly pointed towards these connections between gaming and formal learning, he said in his advice to the

fictional parents: “If they [the fictional children] are, like, twelve [years old], they would be doing things like recent history right now. And it would be quite interesting”.

Students were asked about whether they knew the video about tangential learning before they watched. Three students seemed to know the *YouTube* channel *Extra Credits*, while Aidan had seen that video in particular.

7.3.1.2 Classroom interactions

The introduction occurred normally. The external observer described that students seemed interested. Students also reacted positively to the video *Video Games and Learning* (Extra Credits, 2008), laughing, making comments and exclamations during the video. Later students were asked to share examples of their prior experiences with tangential learning, and the examples given are in Table 8: Initial examples of tangential learning experiences.

Table 8: Initial examples of tangential learning experiences

Pseudonym	Game that triggered tangential learning	What was searched
Charles	God of War	Greek Mythology
Harry	Civilization	Various historical topics, including Ghandi and the Japanese civilization
Nathan	Various games from the Total War Series, including Shogun Total War	Various civilizations, including Japanese history
Andrew	The Binding of Isaac	Biblical stories
Aidan	Final Fantasy	Religious figures and Gods

I wrote the examples given by the students on the whiteboard. Then students were asked about whether they could see a pattern in the examples, and Harry promptly responded that they are all from history and mythology. Later I asked them for examples that do not fit in this pattern, and the group shared new examples, which are available in Table 9: Expanded examples of tangential learning experiences.

Table 9: Expanded examples of tangential learning experiences

Pseudonym	Game that triggered tangential learning	What was searched
Harry	The Last of Us	Infections and species of fungus
Aidan	Portal 2	Physics concepts, such as Schrodinger's cat
David	Tekken 2	Fighting strategies

To discuss another aspect of tangential learning, I commented about the advice for game designers to have a vast cultural background as inspiration, and that sometimes the references to those cultural references are indirect, giving the examples of the elves, which are widely used in video games and that can be traced back to Nordic and Germanic mythology and folklore.

After that, I asked for examples of tangential learning that they could potentially do or that they would like to do, but that they had not done so far. This question was designed to generate ideas for tangential learning in the classroom. Whereas in the previous questions students always answered promptly, in this case they did not. They had no answer. After some time in silence, I gave an example. Aaron then commented that in Grand Theft Auto V (Rockstar Games, 2013) there is a reference to a film, and playing the game made him curious to watch the film. It generated a small digression, in which Aidan and Harry made comments about the film itself, and Nathan gave a similar example: he wanted to watch the Star Wars films after playing the

games of the franchise. At this point, I judged that the difficulty that those students – like the ones from Study 2 – found to generate novel topics to conduct tangential learning in the classroom, and decided to skip the activity based on conducting tangential learning in the classroom. Instead, I expanded the discussion to include other aspects related to tangential learning.

I began to cover the other materials by commenting about trans-media references, building on the examples students gave. I gave the example found in Study 1, when an interviewee declared that the game *The Witcher* (Atari, 2007) inspired him to read the homonymous book series. Harry then shared a different example, in which he searched for the technology employed in the development of a game.

Later I asked students whether gaming experiences change after tangential learning. Harry said it does change; Samuel agreed and added that the game becomes more interesting to the player; Aidan explained that it adds to the experience of playing the game and shared with the group his own experience of playing *Dynasty Warrior* (Omega Force, 1997) after searching about the theme. Nathan added that in historical games, searching about the historical battles makes him more immersed in the games. Aaron also shared his experience of enjoying more to play *Call of Duty* (Activision, 2003) after searching and learning about the D-day. Harry gave a negative example: after searching about the topic of the game *EarthBound* (Nintendo, 1994), he had found out that the theme had religious references, and it had made him frustrated with the game.

After that I complemented the previous question with a different perspective by asking whether tangential learning changes the process of learning about the topic. Harry answered that if he had played a game about a topic, it raises his interest in the subject. He gave an example of hearing something in the classroom that he had seen before in a game. Later I ended the topic commenting that different people experience these connections and learning experiences differently.

The next activity was to read the quote from Squire (2011), in which he suggests that players naturally adopt an inquisitive approach to gaming. Nathan shared his belief that it applies to him, and commented about his reflections about the historical contexts that are not represented in games. Contrastingly, Aaron declared he never had those kinds of reflection, and Harry says that in games such as *Sid Meier's Civilization* (MicroProse, 1991) it can occur, but that these reflections not necessarily would evolve into learning experiences.

Later I explained the experience that some participants in Study 1 described, of finding connections between classroom topics and games previously played, and illustrated with my own experience from my school time. Nathan mentioned that it also happens with him, but mainly in history lessons. Harry shared his experience of asking his science teacher questions that emerged from playing a game. In the end, students answered the survey about the session.

When students were asked about how the session could be improved, essentially two suggestions were raised, both of them around the problem of basing the whole session in whole group discussions, such as Thomas, who said it “could be more interactive”, or Harry, who said it could be “a bit more practical”. It was probably a consequence of my decision to skip the activity based on tangential learning in the classroom. Furthermore, I was influenced by Study 2, in which discussions in small groups were planned but did not work very well, probably due to the small number of students. It made me plan the course focusing in whole group discussions, but the feedback from students in this session made me plan for smaller group discussions in the following sessions.

7.3.1.3 Outcomes of the session

When the students’ descriptions of the games in the interviews are taken into account, tangential learning appeared a lot more frequently after the course. While in the interviews before the course ten out of fourteen did not consider the possibility of tangential learning when analysing the game Rock of Ages

(Atlus, 2011), only Charles ended up not taking into account this possibility. In other words, 13 students commented about this potential of Rock of Ages. In the case of Tales of Monkey Island (2009), which has more subtle searchable references, only Thomas, Aidan and James analysed the game regarding its potential to trigger tangential learning. They described that the game was not likely to inspire tangential learning, and compared to other games, such as Rock of Ages or others. In the example below, James stated it while he also took the fun factor into account: “Because the other one [Rock of Ages] could inspire a lot more tangential learning and learn about the characters. There isn’t much to learn in the Monkey Island. But there is a lot more to have fun, in my opinion”.

Students’ perceptions about what they had learnt in the course and about what changed were expressed in the survey. One the one hand, Joseph considered that he already knew about it, and in fact he took into account in the interview prior to the course. Ryan expressed a similar opinion, even though it did not emerge in his first interview. On the other hand, other students made positive declarations about what they had learnt in this session, with Logan declaring that he had not thought that games could promote learning. With the exception of Joseph, all students declared to agree that they had learnt something in the session, and eight students declared to agree that they began to think differently about games – the other six declared that they neither agree nor disagree. Their answers demonstrated different ways that they perceived the outcomes of the session.

There was evidence in the survey answers of five students (David, James, Andrew, Samuel, George) to suggest that the course increased their perception of games as embedded in culture, which is also associated with games intertextuality. It is illustrated by the quotes “I now see how games are full of cultural and historical references and where inspiration for game design may come from” (David), “it might not change how I play games but it has made me think that games draw a lot more inspiration from culture than I thought they did” (Andrew), and “Makes me think how games are based on real life

influences (...) how games can also relate to films/books, rather than history” (Samuel).

Although the responses of most students in the surveys suggests that in general they understood the main message of the session, Thomas and Samuel declared to gain insight about the reasons why game designers add cultural references to games, illustrated by the quote: “It is made me think more about why a developer chooses to put something in the game, that reflects something in the real world” (Thomas). The topic was not really covered by the session, but only briefly touched by the video about tangential learning.

Finally, three students declared to be encouraged by the session to conduct more tangential learning. In the case of Nathan and Aidan it seemed to be perceived as a positive outcome of the course. It is illustrated by the quote from Aidan, who also comments that the course expanded his knowledge about the topic, although he is the student who had seen the video before: “The theme of tangential learning didn’t really occur to me regarding games with less historical context or religious/mythological context until now”, and “It does bring up more questions about things I play now, such as ‘cyberethics’ or other body-based technologies present in *Deus Ex*”.

However, in the case of Samuel, the encouragement to conduct tangential learning apparently was perceived as an ambiguous outcome of the course, sometimes described as positive, sometimes as negative. He described himself as addicted to play a particular game and to learn about the theme of the game.

When asked about the outcomes of the course, he said:

I think it [the course] changes because it makes you more interested in the game, and want to find out more about it. Like, you become more kind of addicted to it (...) Because you could spend a lot more time on the games. And you would also be spending maybe a bit more time thinking about it and learning about it, rather than like, playing the actual game, maybe? (...) I play a game called Smite, which is about, like, Gods and Goddesses, so I wanted to like research more into this like,

mythical things that people worship and makes, like all these cultures have different people that they worship and what they did (...)

However, when asked about the *good* aspects of Rock of Ages in the interview in the end, he said: “I think the good things are it is quite addictive. In a way it makes you keep on playing”. He did not attend the fourth session about addiction.

It can be argued that another outcome of the session is that in the interviews some students elaborated more complex reflections about games, learning and tangential learning. An example is shown in the quote below, from Aaron:

I learnt that it's quite interesting that someone could play something and it doesn't teach you anything but inspires them to go away and learn. I think tangential learning is what actually makes people intelligent. Because if the kid has the inspiration to go away and learn from self, he is going to be more interested in it. He is going to retain it. Because he's gone out of his way to do whereas, you know, normal education just seems to spoon the kids information and that's it, there is no sort of ‘go home and learn some by yourself’ element.

There are also initial perspectives about learning through the activity of playing games. From the five students who expressed some views about it prior to the course, James, Joseph, Aidan and Charles said nothing about it after the course: in general the discourses about learning in games focused on tangential learning after the course. Only David expressed again his perspective that you can learn something, which he described as “not much, just about the names”. Therefore the most naïve ideas with this regard did not reappear after the course. However, a new one emerged in the particular case of Nathan, who did not mention learning before the course, and expressed an optimistic perspective of learning in games, as presented below:

Thinking back on what we put before, it [Rock of Ages] teaches you bits of skills about physics, you learn bits of gravity,

acceleration, momentum, etc. (...) it is not really learn as it does in the equations, but it comes around as instinctive, such as you automatically know, as you have more speed, you are going to hit the wall further, and you can link that with to have more momentum, and force pressing against the games, and you obviously are going to know about gravity, because you can slice and use the terrain to your advantage to speed up, so you know acceleration and how fast it's going is because of gravity. So, it's not... it wouldn't naturally learn the equations as such, but you'd learn instinctively what it's like, just more acceleration, more momentum, so the larger the object, more momentum, also what shapes are best for rolling. As I went to that square... the cubes are extremely bad down the hill

With regard to the connections between gaming experiences and schools, which were briefly addressed in the session, it also emerged in the discourses of two students, Ryan and George. The former said

if they [players] see [the characters of the game] somewhere else, they can recognise it from this game, so they'll understand a bit more, I guess. Maybe. (...) Because they already know about him, they might pay more attention.

Whereas George made a comment about the opposite process: when players are motivated to play games because of their school experiences, as described below:

If kids are studying history or something like that, and you got that character or person that you are studying in a game it will kind of want them play it a bit more, because it is like 'oh, I know that person, I know what they are' it's like familiarised with them, so if you get a game where you know who the characters are, you'd probably spend a little bit more time than if you have a game that you don't know anything, you have no clue about it. So it's quite a good game for kids.

It should be noted that the two students who mentioned those connections prior to the course were not the same two students who mentioned it after the course.

7.3.2 Games as mind training: getting smarter?

The second session was based on an initial video to introduce the topic of cognitive gains from playing games, followed by a discussion about the topic, and game playing of the games Portal: the Flash Game (We Create Stuff, 2007) and Solipskier (Mikengreg, 2010). Then students analysed the games, reflecting about the skills potentially developed by gaming and their contexts of use, watched and discussed a video about students investigating whether playing games improve hand-eye coordination. Finally, students played the game Auditorium (Cipher Prime, 2008) and analysed it and some of their favourite games. In total twelve students attended to this session: David and Ryan were absent from the session.

7.3.2.1 Prior perspectives of students

In the interviews prior to the course, six students took into account the problem solving or cognition. In the case of Thomas and Charles, they seemed to consider the cognitive engagement proposed by the game as something positive, even though they did not directly express that they believed that playing the game could have influences beyond the gaming activity itself. Thomas said, “[Tales of Monkey Island] gets one to think a little bit more. So it’s not just, again, it’s not just like a mindless game, it gets one to think, what I think is quite good”, while Charles had a similar opinion, adding that this aspect of the game was valuable for entertainment purposes. He argued that a game that is too easy, “sort of takes the enjoyment factor away from it. So it, like, takes the immersion away”.

The other four students (Samuel, Aidan, James and Aaron) made comments that are suggestive of the influences beyond the gaming activity. Aidan said Tales of Monkey Island is “puzzle oriented, so that is good for an educational standpoint and that helps to build logic”, James shared a similar view, saying that it “develops the problem solving skills, so it would be good for children”.

Samuel was the only one who commented about Rock of Ages (Atlus, 2011), saying that it “can also kind of develop their minds, because it has strategy involved”. And Aaron was the one who spoke at greater length about it, comparing the two games:

Rock of Ages was, like, really casual blast, and then this [Tales of Monkey Island] is sort of like, you sit down and you’d go for it. It’s more like to stretch the mind, than it is to, like, have a laugh (...) It [Tales of Monkey Island] gets you to think, isn’t? Makes your mind a bit more active. Like, I’d say probably makes you think more than doing a crossword or something. So yeah, it’s probably good every now and then to sit down and do something like this. (...) feels more enriching.

The other six students did not mention anything with these regards in the interviews prior to the course, even when asked to think about the positive aspects of the game and to formulate advice for parents about it.

In the beginning of the first session they were asked about what they had learnt with games, if anything, and also their favourite games. Their answers are available in Table 10: Prior responses to favourite games and learning experiences. The first seven answers are related to problem solving or cognition, whereas the others are more related to knowledge acquisition (discussed previously). The students who mentioned topics related to problem solving and cognition in the interviews, described above, are approximately the same who gave that sort of answers in the session. Aaron, Aidan, Thomas and Charles are in both lists, whereas Samuel and James said something more related to knowledge acquisition in the classroom, and George, Harry and David gave opinions in the classroom that were not present in their descriptions of the games in interview.

Table 10: Prior responses to favourite games and learning experiences

Name (fictional)	Favourite game(s)	Learning
Aaron	Rock of Ages	Problem solving
Aidan	Tales of Monkey Island	Cognition
Charles	Angry Birds	Problem solving
George	Angry Birds	Knowledge acquisition
Harry	Angry Birds	Knowledge acquisition
David	Angry Birds	Opinion
Samuel	Rock of Ages	Knowledge acquisition
James	Angry Birds	Opinion

Aaron	Portal 2	Problem solving and team work
Aidan	Dark Souls	Patience and tactics
Charles	Star Wars Battle Front	Improved performance in future games
David	Metal Gear Solid	To learn with mistakes
George	The Last of Us	Problem solving, to think outside the box
Harry	DOTA2	Team work
Thomas	Skyrim	To think independently
Andrew	Skyrim	Vocabulary
James	Skyrim	Said he learnt “a lot”, but mentioned only vocabulary
Joseph	(did not answer)	Game market
Nathan	Skyrim	Strategic manoeuvres used in battles, both historical and contemporary.
Samuel	Assassin’s Creed	Lots of places and their locations
Logan	Fifa	Nothing
Ryan	(arrived late)	(arrived late)

Considering that in the interviews only four students explicitly suggested influences that might persist after the gaming had finished, it seems that it is more common to declare that one learnt something with games in a general

sense (e.g. to declare to learn team work from games) rather than to pin down positive aspects of particular games (e.g. to declare that learn team work from World of Warcraft). The Table 10 shows many of the skills students declared to learn. Similarly, the answers given in the classroom also seem to be *specific skills applied to games in general*, whereas when analysing concrete games in the interviews, the few answers that approached the topics were more generic and vague, such as “developing the mind”.

7.3.2.2 Classroom interactions

Students did not have comments about the previous session, so the video *Can Video Games Make You Smarter?* (Asap SCIENCE, 2014) describing cognitive gains of gaming was shown. The external observer described students as very engaged and interacting with the video; in his words, in the second part of the video “every student very engaged, all leaning forward and watching, some students whispering ‘Yes![in answer to the questions posed by the video]’”.

Later I proposed a table in which students had to relate game titles with skills potentially developed, and with examples of context of use. Students were asked to fill with examples, but were at first timid in answering; in the end, only Aaron, Aidan, Harry and Nathan participated in this exercise. Nathan gave the first example: motor skills, possibly useful for surgeons. From this response, I asked the students to think more about contexts in which they think that skills learnt from gaming might be more broadly applied to real life situations. Nathan then associated motor skills with using the phone. Aaron described that attention to detail would be useful in writing activities, which I challenged by asking whether it is the same attention to detail that is required in either case, also asking whether he believed that playing a lot of games with details would make a person a better writer. Aaron then came up with a different example, suggesting that fantasy games could enhance creativity, which could be useful in creative writing. Nathan gave another example, associating attention to details to cooking. I registered the examples given in the whiteboard and highlighted how challenging it is to reflect about those connections between abstract skills and concrete situations.

The next activity was to play games and analyse them. Half the students were selected to play Portal: the Flash Game (We Create Stuff, 2007) and the other half, Solipskier (Mikengreg, 2010). The former game took some time to load, so half of students had less time to play. The students in the front of the class seemed to be more interested and engaged in conversations about the games, while students in the back had less discussion amongst them. Many students decided by themselves to swap and play the other game in addition to the game they were initially designated, playing both. After they had time to play and discuss amongst themselves, volunteers were asked to come to the computer of the tutor and show the game they played to the other half of the group, which supposedly had not played that game. This dynamic was confusing to students: many ended up playing both games, and whereas one of the volunteers explained the game clearly, the other was hesitant and did not summarise the game well. After that, students were asked to think about the two games with regard to the skills and contexts. The examples they gave are in tables Table 11: Students answers on skills potentially developed by Solipskier (Mikengreg, 2010) and their context of use and

Table 12: Students answers on skills potentially developed by Portal: the Flash Game (We Create Stuff, 2007) and their context of use.

Table 11: Students answers on skills potentially developed by *Solipskier* (Mikengreg, 2010) and their context of use

Student	Skill	Context of use
Harry	Fine motor skills	Using a phone
Samuel	Attention to detail	Driving a car
Aaron	Thinking ahead	Making plans

Table 12: Students answers on skills potentially developed by *Portal: the Flash Game* (We Create Stuff, 2007) and their context of use

Student	Skill	Context of use
Andrew	Spatial awareness	Driving a car
Andrew	Analyse the surroundings	Driving a car
Nathan	Logical thinking	Driving a car
Nathan	Planning ahead	Planning a date
Nathan	Motor skills	Jumping
Harry	Memory	Maths and puzzles
Harry	Remove possible options of a problem	Maths and puzzles
Andrew	Multitask	(did not say)

After filling the tables in the whiteboard with examples, students watched the video *Are games good for you* (Science.tv, 2008), which shows students conducting an experiment to check whether playing games improve motor skills. The external observer commented that students were also very engaged with this short video, mentioning that they stopped playing the games to pay attention to the video. (Apparently some students were still playing while the tables were being filled with examples.) Students were told in the beginning of the video that they should look for the limitations of the study presented in the video. After watching, Aaron said there was a lack of methodological explanations. Andrew said the research was limited because it collected data from one task only (drawing a star) instead of a variety of tasks. George added that the study did not take into account any confounding variables. I considered their contributions and explained that the study was looking for correlation, and not causation. I then went on to comment about difficulties with that kind of research, presenting more claims in the literature and the

uncertainties in the area. The external observer described students as very focused in the talk and that the explanation was “very clear”.

The next activity was to play the game Auditorium (Cipher Prime, 2008), and analyse it as well as some of their favourite games. While the external observer perceived students were very engaged with the activities, he also registered that they focused more on the game Auditorium and less on their favourites. At some point a group of students went off topic talking about their games. The discussion about the games and potential gains had to be quicker than planned because of time constraints, so the ideas they generated and shared did not fit perfectly in the tables. The ideas about Auditorium were: Aaron mentioned the skill to think creatively. The discussion about their favourite games was in pairs, so their answers were also in pairs: Andrew and Charles said that horror games could help players to stay calm in difficult or dangerous situations; George and Aidan mentioned that some games could develop multitasking and stress management; Nathan and James mentioned a game that allows them to think on alternative solutions to problems; Harry and Aaron said some RPGs can develop ethical reasoning, which raised comments of other students about their experiences with games that supposedly develop ethical reasoning. Thomas and Samuel said The Elder Scrolls V: Skyrim (Bethesda Softworks, 2011) could improve decision-making. The session then ended with students completing the questionnaire.

In the surveys the suggestions about improvement of this session were not insightful. Some students praised the session, and some of the suggestions were to have more time to play games and to ensure that all students stop playing when it is time to stop.

7.3.2.3 Outcomes of the session

The outcomes will be described individually for each student, following the order: first the two students who demonstrated a more sceptical perspective about the topic of this session, then the four students who were more optimistic about it, and finally the remaining six students who did not mention anything related to the topic.

In the case of Charles and Thomas, who, in the first interview, made comments suggesting a more sceptical belief in the cognitive gains and problem solving skills, and who also made comments related to that in the first session, did not mention anything with this regard in the interview after the course. The uncertain opinions they expressed in the beginning apparently did not shift.

The four students who initially demonstrated a more firm belief in those benefits seemed to express those ideas even more emphatically, in some cases demonstrating more sophisticated reflections. Samuel and James expressed opinions similar to the first interview, while James made a comment about Rock of Ages (Atlus, 2011) in addition to a comment about Tales of Monkey Island (Lucas Arts, 2009), suggesting the game could make one improve his cognitive skills and be more strategic. Aidan expanded his comments about the potential of the game Tales of Monkey Island, also adding a critical view about its benefits:

It still increases general skills, in that it can increase someone's logic. Though I kind of question how logical some of the things you do are. For example, root plus grog not necessarily equate to root beer [referring to the puzzle in the game]. But regardless, it does bear a percentage of logic.

He also wrote in the survey about what he learnt in the session: "The usage of a typical game to teach skills is commonly known, though how they're employed isn't as well known. This has helped relate things to examples".

Aaron, who initially was the student who talked at length about the cognitive engagement proposed by the games, also expanded it further in the second interview, expressing complex opinions about it when compared to his peers. He gave a long description of the thought process he had while playing Rock of Ages, suggesting that the game could help him to think one step ahead, more tactically, develop better reflexes, and to think in layers. He also explained how he saw the importance of having the experiences in which players have to think in layers, managing multiple things simultaneously. In

his description of the Tales of Monkey Island, he also made a long description of the kind of involvement that the game proposes:

I think, sometimes if you just play really fast paced stuff kids get a bit twitchy, like, they get a bit odd, because they are just used with sort of instant gratification and straight away... and to do some of this that is slower paced, like, that's why I play, I played the other TellTale game and I found it was nice to go from something like, a shooter, where is all on all the time, to go to a game where there are conversation elements to it. And there is a bit of problem solving, and it's... you know, the story is told organically. I think that's good. It is contrast. It is important to have a range of experiences. (...) I'd say it [Tales of Monkey Island] is definitely better for a kid than to sit and watch television. (...) It's clever, you know, it will make the kid think, which is important.

Amongst the students who did not express ideas about the topics of this session, there were some differences. George did not express any opinion in this regard in the first interview, and did not express any in the second either, even though in the first session he declared he had learnt problem solving and to think outside the box, and in the survey question about what changed, he wrote: "I can think on each game what skill can I gain from this". Joseph and Nathan made comments about Tales of Monkey Island, which were brief and in a generic level such as "[the game] would probably help them [players] to develop their mind" (Joseph) and "the puzzle in games can improve your cognitive abilities" (Nathan). In the case of Logan, Andrew and Harry, they did not mention cognition and problem solving when they were talking about the two games they had played, but they mentioned these topics when asked about what they had learnt in the course. In other words, they expressed opinions about the topics of this session, but did not take into account when they were describing the games and their advices to parents. Their opinions were the following: Logan only briefly mentioned it as something he had learnt, and said he had never thought about those topics before the course.

Andrew described that he began the course with a vague notion about the topic and developed a more detailed view on the topic:

I've heard before how games teach, like, makes us smarter or teach us things, but I never knew how specific it was. When we went to the course we spoke about, like, how games might make you smarter, but it is not just smarter, it's like, specific skills and things.

Moreover, Andrew also expressed some criticality in the survey, when asked about how the course had made him think differently. He wrote: "I realise that games can improve skills, but I also know that it can be very situational and not necessarily useful", which can be related to issues of situated learning and transference of learning.

Harry and Andrew described that they became more aware of the kind of engagement they have with games, and gave examples of playing a game after the course and being attentive to the skills the game demanded from them. Coincidentally, they played the same game, but had contrasting opinions about it. Harry said:

I never really realised how much you are using your mind, your brain, or different cognitive functions you are using while playing games. So that was really interesting. And when at once you told us about it, I kind of started noticing a bit more. (...) When I was playing a game called Super Hexagon, which requires a lot of reaction times for that, and then I kind of like got a lot better when I was noticing what time reaction you need to do to beat this game. Which stuff I needed to do, how reacting times were getting quicker and how I need to be a lot more accurate and just micro manage this what's coming up next in that. So like I said, I was noticing what to do, and it was kind of making me better in these games because of it.

Whereas Andrew said:

While I was playing games I did start thinking about, like, I did start thinking about what I can learn, take from it, and what it teaches me, because I played the game I think called Super Hexagon, which is just sort of a game where you have this little triangle and you move it around trying to stop it from being destroyed by falling blocks or whatever, and it was a... I just started thinking... I was playing and I started thinking like... this game, all it is, it's just me moving a triangle with two fingers, like, so, it's a very specific... it doesn't... it is not as... I am not sure, it's like not as educational as some other games, you might say. Because all that I am learning from it is how to move a triangle, really.

The students' comments illustrate how they understood and applied the classroom discussions to their gaming practices differently.

7.3.3 Games as messages: hidden lessons?

This session covered two topics. The first one was violence and video games, which was discussed using the video *Expert - Video games don't trigger violence* (CNN, 2013) and the paper of Unsworth and colleagues (2007) to support the discussions. The second topic was representational problems, especially with regard to gender and race, using the Forbes article (Tassi, 2014), and the video *Damsel in Distress: Part 1 - Tropes vs Women in Video Games* (Feminist Frequency, 2013) to encourage discussion. The *Bechdel test* and analogous questions for games, as well as the paper of Dill and colleagues (2007) complemented the discussion in the end. The session was attended by nine students: Thomas, Andrew, Logan, Ryan and Aaron did not attend.

7.3.3.1 Prior perspectives of students

With regard to violence, three students mentioned violence when asked to formulate advice for parents in the interviews prior to the course: Joseph, Harry, and Aidan. While these students briefly defended that the games were not too violent, Joseph compared to other popular games in the market to support this argument. The other six students did not mention violence, even

when asked to advise parents on whether it was a good idea to buy the game for a twelve years old child.

Their interview answers about stereotypes were more diversified, at least when it comes to Tales of Monkey Island. When James was asked about the characters, he praised the protagonist and his wife, describing them as well made and interesting. However, he criticised the villain, saying that, “the evil villain seems quite stereotyped”. In other words, although he formulated a judgment of the use of stereotypes in the scene, he completely ignored the stereotype of the woman who needed to be saved by her husband.

Charles mentions that the protagonist looks like a stereotypical hero who saves a female character, but praised the way the game breaks with this pattern, and concluded by saying that “they all seem like good characters”.

Andrew and Logan were not present in this session, but their initial ideas about the topic expressed in the interviews are illustrative. Andrew also used the idea of stereotypes to describe the scene. He said that although the characters follow archetypes that are overdone, the game also breaks away with the traditional view of those archetypes, going beyond what is expected. However, when he was describing it, the woman was again ignored: “You know, pirate sort of characters and archetypes that you find anywhere else really. There is, you know, you have the main pirate captain, the hero, then the villain captain. So it just seems a bit normal”. Only when asked directly about Elaine, he said that she also was following a pattern: “When you have the pirate genre, you always have female characters either some sort of hostage, it always seems to happen”. Logan, on the other hand, noticed that Elaine was playing the role of a damsel in distress in the game. However, when asked about his opinions about it, he said it was “Interesting. Because you could, like, think ‘what’s this girl done to this pirate to make him want to kidnap her, or what the man had done to the pirate”, which describes the damsel in distress plot as “interesting” and also shows a mentality of blaming the victim, by wondering what she would have done to cause the pirate to kidnap her.

The four students described above were the only ones who considered any kind of stereotypical use in the Tales of Monkey Island, and as it was clear, the role of Elaine in the scene was perceived as problematic by none. The remaining seven students did not consider stereotypes in their analysis, and did not find the damsel in distress role of Elaine worth a comment. In fact, Harry praised Elaine as the best character of the scene: with the best lines, versatile, participating in the scene even though she is tied up, etc.

Students were also asked about the characters in the Rock of Ages, after they had played and were asked to look at the playable characters; context which no students noticed the presence of only one female character amongst 18 male ones and one with no gender.

During the session, students were asked to discuss in small groups and share their views after reading a quote from Hsu (2009), which states that there is a lack of representation and stereotypical representation of some groups in games. The ideas shared by students can be seen in Table 13: Initial ideas of students about representation of gender and race in games, from classroom discussion. Although these ideas were generated after students were exposed to one of the materials, the ideas preceded the video, which addressed the topic more deeply, so these ideas were expressed in an early stage of the discussion and are illustrative of their prior perspectives about the topic. I intervened very little during this time, only asking at some point whether students were taking into account the exposition of the bodies and the sexual gestures and references of the characters, using the example that they had used of Bayonetta (Sega, 2010), who not only has a normative body, but sometimes has most of her body uncovered and frequently makes sexual references. This comment of mine triggered Aidan's comment on the nature of sexualisation of men.

Table 13: Initial ideas of students about representation of gender and race in games, from classroom discussion

Student Idea

Aidan	Bayonetta is an example of a liberating female character, because she is strong, well-written, and “she is sexy and she knows it”. However, he also argued that she is actually not a sexualised character, because she is 7 feet tall, hence too tall to be considered a sexy woman.
Aidan	Elizabeth from Bioshock is a positive female character: well written, complex, and transitioning from being evil to being good. (Note: despite the complexity of Elizabeth (from Bioshock, 2K Games, 2007) as a character, her story includes her being raised captive in a tower for her whole life until she is saved by the male protagonist, which is precisely the damsel in distress model that was addressed after this discussion.)
Harry	Fighting games usually have many main characters, allowing for more diversity.
Nathan	One “solution” to the lack of representation of women in games is the one found in many RPGs, which have customizable characters and allows players to choose their gender.
Nathan	Male characters are normally burly and muscular, and therefore sexualisation works in both ways.
Aidan	In the case of the depiction of male characters, there is a celebration of male forms, but not sexualisation.
Aidan	The sexualisation of men is different from the sexualisation of women. The former are sexualised through muscular body and the acts they perform (e.g. aggression) and not through their depiction. Therefore some games sexualise women, but all games sexualise men.

Nathan	Not all games sexualise men. For example, Grand Theft Auto does not.
Harry	Female characters are more rare in games, and because of that they are more highlighted when they are sexualised. He criticised Anita Sarkeesian (before her video was shown) because she ignores that men are also sexualised, and that in all cases that there is sex in video games, it involves both a man and a woman.
Charles	Most characters are white because most of the target audience is white.
Harry	The market wants white characters.

These were the ideas shared before the video about the representation of gender and race. To summarise, their prior analysis of the games made Elaine practically invisible, and no criticism was made to her stereotypical role. When discussing gender and race representation in the classroom, the initial ideas expressed resistance to admit that there is a problem, as well as some problematic understandings of gender representations.

7.3.3.2 Classroom interactions

Students were asked to write the name of their favourite games and protagonists on the whiteboard, which kept students entertained while waiting for the others to arrive, and also triggered conversations about games amongst them.

I began the session warning them that we would address some negative aspects of gaming, and that some of those are very controversial. The next activity was the video about violence, and while I was setting up the video, Harry and Nathan made comments about how sensationalist the media can sometimes be, citing the *Daily Mail*. They also made comments after watching the video: Harry said the interviewer was making leading questions, and agreed with the

scholar Patrick Markey, interviewed in the video. Nathan also shared his opinion on how biased media coverage can be about such topics.

After that short discussion I made a distinction between two topics: the influences of violent games and the media coverage of the topic, followed by a brief explanation of the study of Unsworth and colleagues (2007), which found that some players get more aggressive, less aggressive, or were not affected, instead of considering a single possible outcome of playing violent games. Harry commented that violence in games is a real issue, and that age ratings address this issue. Aidan commented that such studies tend to assume that the violence is the cause of the anger, ignoring other aspects such as gameplay ones, to which I commented about a study that suggested that competitiveness would be more determinant than depiction of violence (Adachi and Willoughby, 2011). Aidan replied citing another study that supposedly suggests that the difficulty of the game also influences. Harry said that other media, even books, can also have much violence. Nathan added that psychologically unstable people can react differently to violence in the media, being unable to differentiate reality from fiction. I then summarised some of the ideas and carried on to the next activity.

To introduce the next topic I read the quote from an Internet article, which describes the lack of representation and the stereotypical representations of gender and race in games, and asked students to discuss the questions about it in small groups. Harry had a dominant role in his group, which arguably occurred during the whole session, as he clearly was involved with the topics prior to the session. The other groups hesitated to begin the discussions, but according to the external observer notes, they soon were “deep in discussion” and “they could have talked much longer but it was right to stop them when you [Rafael] did”. When students were asked to share their ideas with the group, they shared the ideas described in the previous section and available in the Table 13: Initial ideas of students about representation of gender and race in games, from classroom discussion.

After the initial discussion about the topic, I said we would watch the video *Damsel in Distress: Part 1 - Tropes vs Women in Video Games* (Feminist

Frequency, 2013) with Anita Sarkeesian. As in Study 2, there were reactions to it. Nathan exclaimed that she is controversial. Joseph said she is a “woman Hitler”, and Harry mentioned that he recently had written an article about her. I asked how many students knew about Anita Sarkeesian, to what six students responded positively, while two said they had watched that particular video. I then asked whether they had heard about the *GamerGate* scandal, to what Harry made an exclamation. In total, five students said they had heard about it. Then we watched the video.

After watching the video there were some reactions from students, all defending games. Harry accused Anita Sarkeesian of beginning a gender war. Aidan agreed with Anita Sarkeesian, but only regarding old games, justifying that the damsel in distress trope was used in old games when the technology was limited and the stories, simple. Therefore the damsel in distress was just a simple plot to justify the action. Nathan reinforced that all her examples are of old games. Harry argued that films and TV also employ the damsel in distress.

Linking to Harry’s comment, I carried on and commented about the *Bechdel test*. Harry said that the *Bechdel test* was showing how much sexism there is in games, and that Anita Sarkeesian should go and criticise films then. I commented that, in opposition to Anita Sarkeesian, many people seem to want the game industry to remain as it is, i.e. not taking into account how gender and race are dealt with. Harry agreed that the game industry has to change, but he argued that Anita Sarkeesian is generating division, arguments, and insults where there is no need. He then said he was not happy that Anita Sarkeesian was using game images without proper authorisation, but he considered that the case of Utah (when Anita had to cancel a lecture in the university due threats) “got out of hand”.

Continuing with the session, I suggested some questions that could be made to games to assess sexism in the game market, in an analogy to the *Bechdel test*. The first question was “how many female protagonists can we remember?”, illustrated by a selection of game protagonists who are all white brow-haired men; the second was “How many of them are not overly sexualised?”, illustrated by a comic about hero outfits and medieval armours in games,

which sometimes are depicted differently in order to expose more of the female bodies; the third was “How many of them rescues a defenceless male?”, showing a satirical image of Princess Peach saving Mario. Students seemed to agree with the idea that armours and outfits are designed differently to sexualise women, but they did not give further feedback about this moment, possibly because they noticed that I had to rush through the material due to the lack of time.

Finally I presented briefly the research design of Dill and colleagues (2008), in which they exposed participants from one group to sexualised imagery of women, while another group was exposed to non-sexualised imagery of women, and then asked both groups to judge a case of sexual harassment against a female student. I asked students what were the outcomes they were expecting, and Harry predicted that people who were exposed to sexualised imagery would be less empathetic to the woman suffering harassment. I complimented him saying that it was the case for male participants, whereas female participants had the opposite reaction. Nathan criticised the study because they only looked for sexualisation of women, whereas men also suffer sexual harassment. Harry wondered about the results if the roles (i.e. male and female) were shifted. I closed the session highlighting that the study was suggesting that such kinds of images exert more influence in our perceptions than we normally believe.

Students were asked to fill the survey for the session. Unfortunately the end of the session was rushed because the activities took longer than was predicted, and four students wrote this in the survey, suggesting that the topics would need more time to be covered. Because of this lack of time, the names they had written in the board were not really explored in terms of their representations, but only mentioned briefly.

7.3.3.1 Outcomes of the session

Violence was a topic of this session that was not widely commented upon in the interviews. In the case of Aidan there was not much difference: he initially said Rock of Ages had practically no violence, and after the course he

commented the same about Tales of Monkey Island. Joseph and Harry, however, elaborated more about the violence of Rock of Ages. They both considered that there was no violence in the first interview, but in the second they said there was violence. For example, Harry said: “I think I saw, because of the lesson of violence one, the violence, I kind of... I was running over innocents, it was a lot more senseless than I could remember”. They ended up recommending the game because the violence of Rock of Ages is minor when compared to other games in the market.

From the six students who did not mention violence in the first interview, four ended up making no comments about violence. Charles mentioned it, saying that there is no crude violence in Rock of Ages, and Samuel mentioned that he learnt “stuff” about violence in games, but only when asked about what he learnt in the course.

With regard to gender, only one student who attended to this session made no comment about gender representation in the interview at the end of the course. The topic of race representation appeared timidly in a few cases, which was expected due to the focus of the session on gender and the blatant gender issue in the games chosen.

Three students seemed to disregard the topic as relevant. David declared that he does not care about those topics, whereas he recognised that it is good to know about them because they matter to other people. His opinion is illustrated below:

Because when I play games I play them just to enjoy them, I don't care about what's the main character representing, you know, they're Hispanic, or Black, in a positive light. I don't really care about that, to be honest, I wouldn't mind if all the main characters were white, strong males, and there was no female or whatever. Because it really doesn't matter to me.

Similarly, Charles recognised the use of stereotypes, such as he had done in the first interviews. When I asked specifically about Elaine he elaborated about her role by considering her more active than a typical damsel in distress, due to the

fact that she speaks, which makes the scene more interesting. In the end, he declared that he does not care about the topic, and regarded the topic as unnecessary for a typical player:

If you are, like, maybe a games reporter, or like, you work for something like IGN [Imagine Games Network]. Then maybe you do need to know about this, and you need to report on this and stuff. You need to know about how women are portrayed, you need to think more about the game. But for someone like me, who is just a typical member of the public who enjoys gaming, and doesn't really need to think about how characters are portrayed in the bigger picture.

Joseph had a different approach. He did not declare explicitly that the topic was irrelevant, but the judgements he shared had no concern for Elaine. He initially said that the characters of the scene were interesting, and I asked specifically whether he considered the three characters (Elaine, LeChuck and Guybrush) equally interesting. He answered positively and made a long description of LeChuck and Guybrush to support his argument that the characters were interesting. And completely ignored Elaine. Later, when formulating advice to the fictional parents in the game store, he recommended the game, arguing that: "I think it's quite easy for a child to understand, you got your very clear antagonist and your protagonist, and what you are trying to achieve". He was the only one who completely ignored the issue.

The remaining six students who attended to this session were more receptive with regard to the feminist message. The perceptions they shared are presented below, from the one who seemed the least worried about the issue to the one who seemed to worry the most. Aidan recognised the damsel in distress and described Elaine as a particularly complex damsel in distress:

Despite her rich personality, the wife is still presented in a damsel in distress, basically. (...) Some may associate it as a cheap motivation. But arguably, since she is fleshed out, especially if you play the original seekers of the Monkey Island

and whatever, you'd so find she a fleshed out character, that you wouldn't really be saving her for no context. You'd probably be saving her because she is still such a fleshed out character that you could potentially like that character. It is not just the worthless prize, basically.

As Aidan, Nathan also recognised the damsel in distress and defended the game. However, Nathan's argument was that the game satirises the stereotypes:

There is a stereotypical bad guy, with his over the top plans, and there is the typical heroine in distress and the typical hero, and it kind of take the mick out of the... it's hard to explain. (...) I guess since it's mocking these stereotypes it could [convey] the slight message that these stereotypes are just silly and bad.

Harry was an interesting case; he seemed genuinely interested in the topic and had some background knowledge about it. He also seemed to be sensitive to the problems of female representation, and able to articulate the theme. However, he was very defensive about such criticisms being made to games. It was clear from his emotional and active participation in the classroom, and it is illustrated in the quotes below:

In this part here she was a damsel, she was in distress, obviously she is kind of portrayed as a bit more of a... someone who can like take... do more than a normal in distress would do, but obviously she is captured and she needs her husband to come and get her. So that's a typical damsel in distress. (...) I just showed so many times that the damsel in distress is such a normal topic, it happens in films, TV shows, but if it happens in games apparently it's the end of the world. (...) But it is overused, and I think it has been used a lot less in current games. I feel we are a lot more focused on more heroines.

When he was describing the characters he forgot the name of Elaine, and joked about it: "Guybrush's wife, that's probably not the best way to call her [laughs]

if we are talking about the damsel in distress not even knowing or remembering her name”, suggesting that he was at least concerned with it. Later he also described the damsel in distress when talking about an episode that occurred after the session:

I was playing Dragon Age Inquisition quite recently and one of the parts which you have to go and save a woman. And while also this woman was completely in a bikini and just sat there, ‘oh that’s a lot more standing out’. Like, if it were two or three years ago I’d like, that’s kind of normal. But it is a lot more blatant obvious.

George was another interesting case. In the interview after the course he seemed to consider representation of race and gender very important, and he was also the only student who talked about representation of race beyond a mere citation. However, he failed to perceive any problem with gender (or race) representation in the first scene of Tales of Monkey Island; he considered that the game was very good on balancing the characters out. When asked about the scene in specific, he made clear that he was basing his opinion about the game more on other games of the same series and the same developer, which he had played previously. In the end, he seemed to fail to perceive anything problematic in the game.

And what we discussed in session three about kind of gender equality, it’s got the woman in there, it kind of got... there is no particular stereotypical there, it’s just people. They are just people. (...) In the Monkey Island you kind of get all ethnicities on it. Everything is balanced out. So there is no kind of stereotyping in it. And because it’s a kid’s game it’s quite good for that. Because kids kind of see and go ‘oh that’s normal then’. So some kids kind of play and it’s just one ethnicity. It might be, like, don’t regard any others. And that’s kind of what they carry out through life.

James was one of the few who made a comment about stereotypes before the course. After the course, his comment was more specific, moderately criticising the trope: “It does tell off a quite strong stereotype of the girl being damsel in distress. (...) It could be bad if you think about it too much, but on its own it’s not that bad”. Furthermore, he was the only student who attended the session and made a comment about the lack of female characters in the Rock of Ages.

It’s got quite a variety of characters to try, with historical events. Although it does have I think only one or two female characters? (...) I haven’t realised in the first time how very few female characters there are, because I just looked at the characters and didn’t really give much thought. But now I imagine that’s weird. They could definitely put a few more female historical characters in the game.

And finally, Samuel expressed the most emphatic critique of the trope:

Another bad thing is that I think it’s like, gender biased, like, is about a man saving a woman, and that the man is versus the man, over the woman. (...) It happens in like, most games, like Mario. And that’s just a normal thing that man would be attracted to, because they want to be seen as super hero. (...) It’s a bad thing because it’s like, stereotypical. Man always like, have to fight over the woman, woman is powerless, while man tries to save her. (...) puts, like, women off the thing and it makes men in real life think that males are to be the hero while women are defenceless and always need to be saved. Which I think is a bad thing because like, women can handle themselves.

In summary, from the nine who attended the course, three seemed to ignore or regard this as an unimportant topic, and the remaining six had more positive accounts. Amongst these six, three considered the issue relevant and complemented their opinions defending games somehow, one found the issue very important but failed to notice it in the game, one did notice the lack of

female characters in Rock of Ages, and one made a more severe criticism of the trope.

One notable event that happened about this topic was that there were two students who did not say anything with these regards before the course, missed this session, and ended up making comments about it in the interview in the end. There was Ryan, who was the most absent student, coming only to the first session. In the last interview, he commented about all characters in Rock of Ages being male and aggressive. He said: “I imagine some females would play it, like, they are different, but they are the same. Like all strong males. It would be better to have a strong female or a weak male, or a weak female as well”. The other one, Aaron, came to the last session when I reviewed briefly all topics, and seemed to be in touch with other students of the group, so perhaps the topic emerged amongst them. In the interview in the end he spoke at length about the issue of sexualisation of female characters that create unrealistic expectations of female bodies, as well as the importance of representation of women and homosexual characters. He praised Elaine for being a “normal woman”, smart and not sexualised, and praised games in general for approaching homosexual relationships in a more positive manner than other media. As it will be seen in the next section, although Aaron was not present in the third session, in the fourth session when I asked students to analyse the game *3rd World Farmer* (Arcade Town, 2006) about what was represented there, Aaron participated even though he had missed the third session. The other three students who missed the third session said nothing in the last interview about stereotypes, gender, and race in games.

7.3.4 Games as engaging objects: addiction?

In this session the topic was introduced by the video *Game addiction (part 1)* (Extra Credits, 2010), and the discussion about it was complemented by an explanation of the paper of Skoric and colleagues (2009) about high engagement with games and addictive behaviour; the idea proposed described by Kamphorst (2011) of creating devices for self-regulation in gaming; the Forbes article of Tassi (2014) which talked about the success of the game Clicker Hero (Playsaurus, 2014); the game *3rd World Farmer* (Arcade Town,

2006), as well as a review of all topics of the course in the end. There was also the activity to elaborate a list of game elements that make games compelling, based on students' ideas. Nine students attended the last session. Thomas, David, Samuel, Harry, and Ryan were not present.

7.3.4.1 Prior perspectives of students

Differently from the other topics, the topic of this session was explicitly addressed in the interviews. Therefore, all students made comments about excessive gaming, in all interviews. From the students who attended to the session, none commented about it before they were directly asked, doing so only when directly asked. When asked, James and Joseph emphasised that excessive gaming depends more of parental control than of the game itself. For instance Joseph said:

Because I feel that it is not really the game developers and the game market to decide how long they should be playing it. It's for the parents. (...) Either you would have to say: 'ok, you can play whenever you want, and you have to be responsible', or you have to put down the rule. The parents have to put down the rule and say.

Other students expressed opinions focused on aspects of the game that would potentially stimulate excessive gaming. While Logan mentioned both game aspects and parental responsibility, Aidan, Andrew, George, Nathan, and Charles focused on games. For instance, Nathan compared the two games:

This one [Tales of Monkey Island] might be a bit more of a problem [than Rock of Ages]. Because it can be a lot longer than the previous one. Although the replayability wouldn't matter so much because it is a storyline so maybe the first period after they get the game, maybe the child will play quite a bit but after that they would probably won't play so much.

Aaron expressed an opinion that excessive gaming is not essentially different from other excessive activities, and suggested that excessive gaming is a

problem of the children, and it is not confined to the game. He added that the parents should try to understand what is happening. A selection of his explanation is below:

If a kid is going to do too much of something, you know, it's more an issue... that's not to do with games. That's just an issue that the kid has. Maybe the parents should look into why doesn't want to go out. If he wants to stay in all day. I think it's more, like, before video games existed kids still spent too long watching TV (...).

It should be noted that the session was not only about excessive gaming, but also about the elements that make games compelling. Paradoxically, the same elements that encourage excessive play can also be perceived as the elements that make games enjoyable. Therefore, it could be argued that all the answers describing the good elements of games, i.e. which make them fun, are also pertinent to this session. However, those answers are described separately in the next section, because strictly speaking they do not concern the influences of gaming that extrapolates the gaming activity itself, unless students clearly imply that the good elements are likely to stimulate excessive gaming.

In the last interviews students estimated the number of hours they play; both in term time and holiday time. Their estimations can be found in the Table 14: Students' estimation of gaming hours per week.

Table 14: Students' estimation of gaming hours per week

Students present in the fourth session	Term time	Holiday time
Nathan	40	60
Aidan	42	56
Joseph	20	56

George	18	36
Logan	22	26
Andrew	10	15
James	7	10
Charles	5	10
Aaron	2	10
Students absent in the fourth session	Term time	Holiday time
Ryan	25	40
Samuel	20	30
Harry	13	22
Thomas	13	20
David	14	16

The number of hours of the students who did not attend to this session is made available to the reader because the time spent playing games is related to the course as a whole, as well as the current session.

7.3.4.2 Classroom interactions

Students were asked to write on the whiteboard the name of the most compelling games while they were arriving at the classroom, which made them talk and interact more while waiting for others to arrive. When the session began, I quickly mentioned the topic of the session and played the video *Game addiction (part 1)* (Extra Credits, 2010), which argued that the term

compelling is more accurate to describe games than addictive, stated that although excessive gaming is actually a problem, there is an exaggerated hysteria about players dying out of excessive play, and problematized the action of blaming games when there are external factors that pushes players to play excessively, such as absent parents. Aidan was the only student who declared that he had seen the video.

After the video, I commented about the Part 2 of the video, about excessive gaming amongst adults, in which one of the authors, James Portnow, used a very different, personalized approach to address excessive gaming, telling the audience about his previous problems with excessive gaming and the losses it represented to his life. Again, Aidan was the only one who had seen the second part. I asked for comments about the video, and students had none, so I carried on to the next activity.

I explained briefly the results found by Skoric and colleagues (2009). They distinguished between students with high engagement with games and students with addictive behaviour about games, arguing that only the latter was related to decrease of academic performance of students, not the former. There was a comic in the slide about excessive gaming, that provoked some laughter from some students.. When I described the problem of excessive gaming relating to the experience of one planning to play games for a while and do something thereafter, and because the game was very entertaining, he or she ends up failing to do the other activity, many students nodded with agreement. My impression was that the first part of this session had a slightly more anxious atmosphere, possibly because we were addressing the most concrete and perceivable problem of gaming in their own experiences. Students became more active when the session shifted to the compelling elements of games, which was a more positive lens to look at the topic.

The next activity was to show a very short video presenting an app designed to support self-regulation in games, proposed by Kamphorst (2011). Then I asked students whether they had their own strategies to avoid playing excessively. They initially had no answer to that. Aaron then said that he had decided to play only during holidays.

After that I made some comments about the game Clicker Heroes (Playsaurus, 2014), and its simple game structure that stimulates players to keep playing. Aidan knew the game, and he said that he did not enjoy because there is not enough challenge in the game.

In the activity of generating a list of compelling elements of games student began to participate more actively. I asked for compelling elements of games, and after they finished with the ones they could remember we went through the games they wrote in the board in the beginning of the session, exploring the compelling elements of each of them. Their ideas can be seen in the Table 15: List of compelling elements of games made with students' suggestions.

Table 15: List of compelling elements of games made with students' suggestions

Student	Initial compelling elements of games
Nathan	Many choices that affect the end of the game
Aaron	Story
Andrew	Sense of accomplishment
Nathan	Rewards
Aidan	Short cycles, or “short bursts”, so the player always think s/he can play “just one more”
Charles	Surprise
Charles	Uniqueness
Nathan	Upgrades or achievements (rewards)
Aidan	Cosmetics (rewards)

Nathan	Hilarity
Aidan	Competition
Aidan	Randomness
Aidan	Difficulty
Aidan	Collection
Andrew	Sense of community, when many people play the same game
James	Replayability (game is different every time you play it)
Aidan	The possibility of mess around and lose track of time
Nathan	Much content to explore
James	Freedom to do things one cannot in real life
Aaron	Chance to roleplay different characters

After generating the list, students played the game 3rd World Farmer (Arcade Town, 2006). They were asked to play the game and think about how the game could change to become more compelling, based on the list on the board. There was a problem with the loading time of the game and a long advertisement that could not be skipped, but soon they were all playing the game. The external observer described this moment as follows: “Students appeared to enjoy the game, all were engaged and talking amongst themselves. Lots of laughing, sighing, cheering, etc.” I had to remind them to stop playing and think in small groups about the activity.

When asked to share what they had discussed, Samuel said that the game provoked a sense of accomplishment when the player manages to make some profit. I had to remind him that the activity was about what could be improved

in the game, to what he replied that the game does not need a story, because it is a simulation game. Andrew then said although there is no story, you can feel emotionally bound to the characters, wanting to save them. Aaron said the game is not compelling and is similar to gambling, because of its randomness. Aidan was the first to actually suggest some change to the game, saying that the game does not offer meaningful choices, and that the game could make the death of characters a more meaningful event (the character just disappears if he or she dies). Nathan added that the game could have more resources such as crops and tools in addition to money, making it more complex.

After that activity I made a brief review of all sessions, commenting of what we had addressed in each one. I was also asking students to comment how the game 3rd World Farmer, which they had just played, could be analysed through the topic of each session. When I talked about tangential learning, Aidan said one could search about how much realistic 3rd World Farmer game is. When I talked about cognitive gains, Aidan mentioned one could develop micro management and risk management skills by playing the game. When I talked about what is represented in the game, Aidan said that the characters have no personality. Aaron complemented this perspective, saying that the game does not consider any aspects rather than money and health, hence ignoring aspects such as happiness. He argued that the game then gives the impression that life is confined only to money.

After the review, the last activity of the course was explained. In three groups of three students each, students were asked to choose one game they know and analyse it using all the topics. I helped them to decide which game each group would analyse. The games were FTL: Faster Than Light (Subset Games, 2012) (Aidan, Aaron and Joseph), The Elder Scrolls V: Skyrim (Bethesda Softworks, 2011) (James, Charles and Andrew) and Grand Theft Auto (Rockstar Games, 1997)(Logan, Nathan and Samuel). Students engaged in the activity, including Nathan, who despite my requests to stop playing, carried on playing and at this point he won the game, to my surprise. He was very excited with it, I congratulated him for winning (I have not managed to win it) and he engaged in the last activity normally. The observer wrote that Nathan frequently

throughout the course seemed to be distracted but later on he would show that he was actually paying attention all the time, even while doing something else. In the end I asked them to share their thoughts with the group, making questions to ensure that they addressed many of the topics, while at the same time having to hurry them up because of the time. I also asked at the end of each game description whether they considered that the game offered a rich experience for them, in general.

About Faster Than Light, the group said it could stimulate one to learn about space travel (first session), to practice management of stress and risks (second session), there is not much to say about character representation (third session) and it is compelling because it allows for short gaming sessions and high replayability value, i.e. it generates new random scenarios each time (fourth session). About Grand Theft Auto, the group said that it has a satirical element, and it could stimulate players to investigate those satyrs (e.g. to famous brands) (first session). The group said that the game does not allow players to learn anything useful (second session), and the representations of the game are stereotyped, e.g. black people depicted as gang members (third session). About Skyrim, the group repeated an example I had given previously about one investigating how realistic the weapons of the game are (first session), could stimulate one to learn to make plans, to have commitment and to manage your character (second session). After that I made some final remarks and closed the course. Then students then were asked to complete the survey about the session as usual. No improvement was suggested in the surveys, and some students praised the course.

7.3.4.3 Outcomes of the session

When compared to the other sessions, the comparison between the interviews before and after the course offered more limited difference with regard to excessive gaming.

In the case of James and Joseph, their discourses focused initially on the parental responsibility, whereas after the course their opinions focused more on the game aspects, similarly to most other students.

The discourses of Logan, Aidan, Andrew, George, and Nathan remained similar when compared to the first interview. Essentially, when asked about the specific concern of excessive gaming, they described characteristics of the game that would make it more or less compelling, in their opinions. In the case of Aidan and George, the compelling elements we discussed in this session also emerged when they were asked about the positive aspects of the game.

There is an idea from one of the videos that seven out of nine students mentioned as something they had learnt with the session. The idea was the argument that games are not addictive, but compelling, from the video *Game addiction (part 1)* (Extra Credits, 2010). It appeared clearly in the interviews of Aaron, when he said “I learnt that video games can’t be addictive because by definition they just aren’t addictive, there is no reason they cause addiction. It’s just within the person”, and George, who said:

When we learnt about, kind of ‘are games addicting?’ that was really interesting. It’s like they are not addicting, it just makes you want to play some more, so it kind is, but it isn’t. Is your personal choice to play it. The game doesn’t force you to. You want to go and play.

This idea also emerged in the surveys. They wrote: “Games are compelling, not addictive” (James) “I had always wondered if addiction was the right word” (Joseph), “Games aren’t addictive, but rather compulsive [sic]” (Charles). Another aspect of this was manifested in the interviews when Charles expressed an opinion that also places the agency of excessive gaming on the player: “I think the child can probably limit themselves to be honest”. Whereas in the cases above their opinions seem focused on the terminology, in two cases they sounded like denying the problem, such as: “I never knew that addiction wasn’t real” (Logan) and “It has made me more aware about the facts of gaming addiction in people, that it doesn’t exist” (Nathan). However, in the case of Nathan, he later described excessive gaming as a problem of his own practice (see below).

On the other hand, in the surveys they also reflected on the elements of games that make them compelling, which to some extent seems the game more of an agent. The opinions with this regard were: “I never reflected about the different ways games compel us” (Andrew) “Found out/realised why games can be compelling” (Joseph) “I have learnt more about gaming addiction and that there are underlying issues when discussing about it” (Nathan) “One generally doesn’t think about what makes a game compelling, so this helped me realise what can make a game compelling” (Aidan).

When asked about the impact of the session, two students said they reflected about their excessive gaming practices, and thought about playing less. In the interview, Nathan said it “has [changed], maybe, worries I may spend too much time on games. Because of the addiction part of that. (...) It probably means I’d play games a bit less, because of the addiction part of it”. James wrote similar in the survey: “I now want to think more about how often I play games, and how much of my life is spending on when I could be doing other things”.

7.3.5 The course as a whole

Some ideas expressed by students referred to the course as a whole, especially in the last interviews, when the questions following questions addressed the course as a whole: what they had learnt, what changed, suggested improvements, and whether they believe similar courses should be offered in schools or colleges. Some other findings that refer to the course as a whole are also presented in this section.

7.3.5.1 Prior perspectives of students

The interviews before the course were the main source of data from the students’ preliminary ideas. Those ideas were described before the session that covered the correspondent topic. The questions were about general aspects of the game, i.e. positive and negative aspects of the game, characters, experience and recommendation for parents. Therefore, the questions were not directly about the influences of gaming, with the exception of the question about excessive gaming. Consequently, the majority of students’ answers described

characteristics of the game that are not directly related to the influences of gaming. They were diversified; sometimes vague, such as: “Well it’s kind of enjoyable, you know. Like, to roll the ball down, trying to dodge all the obstacles and all that” (David), or specific, such as “it’s sort of, like, a tower defence game, but it got a unique twist on it in the same time in the sense that you are taking part on it instead of just building defences all the time.” (Charles). They also expressed much criticism about the game, for instance, “the motion control could, when you are moving your person, I find that to be noxious, the way you have to click and drag and check the cam angle” (Nathan). Because the ICEED model focuses on the influences of gaming, the findings unrelated to those will not be described in detail. However, the reader should have in mind that the majority of players’ discourse focused on game aspects, regardless of the potential influences of gaming.

7.3.5.2 Classroom Activities

In the interview after the course, students were asked about suggestions of improvement to the course as a whole. Thomas, Ryan, Logan and Samuel did not have suggestions. Charles wanted more games, and more time to play games. Andrew said sometimes he was confused about some of the questions I asked. David and Joseph expressed a concern about some students dominating the conversations while others would be shy. Joseph, for example, said:

At least the first few sessions, probably only a few people were very vocal about their opinions. While I think everybody else was sort of shy and trying to see how comfortable they were and getting to a more comfortable area and then express their opinions. So I think perhaps if it was just smaller groups of people. Or, like, there are activities in which... several activities per session where small groups would interact. It might feel more comfortable in expressing their opinions. And then you may get more of a discussion going. Because there might just have been a few vocal people who had really researched what’s going on, their ideas about it, they developed their opinions around it.

The most common suggestion was that the course needed more time. Harry, Nathan, David and George made this recommendation. David expressed it saying that I should select less material, suggesting that I should “try to come into the sessions with less (...) I’d have a lot to say about, like, two topics that you covered. Well you probably had like three more to cover”. The other four said the course should be longer, illustrated by George:

If the sessions could be longer, because we found ourselves running out of time. All the time, in all the sessions we run out of time because we had these detailed discussions about it. And everyone likes to talk, and we just don’t have enough time in that kind of one hour slot to everyone to talk about it. So it would be nice to have one and a half hours or something, just to discuss them all.

Aaron, James and Aidan had no suggestions, and at this point of the interview he praised the course: “I thought it went really well” (Aaron), “I don’t really think on anything to improve, because it worked pretty well in my opinion” (James) and Aidan:

I think the course was done pretty well in that you presented the themes we were going to explore in each session very well, and the way you were asking for participants’ insights for each theme was very well done as well.

7.3.5.1 Outcomes of the course as a whole

In the end of the course three questions were made to students about the outcomes of the course. I asked them what they learnt, whether the course changed how they see games and gaming, and whether they think similar courses should be offered in schools/colleges. In this section only the answers concerning the course as a whole will be presented. The limit between their answers related to what they had learnt and what had changed sometimes is blurred, so their answers about these two questions were grouped together.

Charles found the course interesting, but he does not give much importance to the topics. It is illustrated by his quote:

I did find the course interesting, but it was sort of like, ok, it was more of a curiosity thing it wasn't the case of... 'oh, this is definitely what I want to do, I want to know more about this'. It was more of a... after the things I was like 'oh that was pretty interesting' and then I didn't really worry about it too much.

Ryan, who came only to the first session, also expressed lack of interest in the topic. However, he suggested that the course topics could be raised in conversation with friends:

When I've been playing games I haven't really thought about the educational side of it while I am playing it. I just play the game and.... That's it. But it's definitely interesting the idea of it. (...) Maybe if I am talking to someone about it, maybe I'd think about the educational side a bit more. But when I am playing it... I don't... I just zone into the game, and that's it.

Another aspect related to how much students learnt was the extent to which they had been previously informed about the topics. In this regard, Joseph found little value in the course, claiming that he had been well informed before the course. He said:

It's hard to say what I've learnt because I'd say I am fairly invested in the video game side. (...) I am quite invested in it and I research a lot of stuff that goes on it. And I read about things and I listen to other people's opinions. So I would say, if I wasn't so heavily invested before I probably would have learnt quite a lot. But I think because I am so heavily invested, I haven't learnt so much.

When asked about whether anything had changed, he also answered sceptically:

I am not entirely sure. I think it might have done. But I wouldn't be able to specify the details. So I think it might have changed my opinions slightly. Or it might have made me view different things slightly, but... I can't entirely know how.

Aidan also said he had been well informed. He said in the interview:

Well, I already kind of was informed of games in several respects, including what I've been shown during the course. So... it didn't really change what I thought massively, but it did, and it gave the extra knowledge to be able to do so from like, a beneficial standpoint.

However, in contrast to Joseph, Aidan seemed to find more value in the course. He wrote in the survey of the last session, about the course: "When you put all the session elements together, you can determine whether a game is actually valuable or rich". In his survey questions with a Likert scale he also had the most positive responses about learning and impact.

The remaining eight students who expressed a view about the course as a whole provided more positive feedback, expressing some different ideas about it. Logan simply said that "I learnt a lot", Samuel said that "I think it does [change], because I think it makes you ask a lot more questions and wonder about them more", and David: "Widened my understanding about games. Not so much about gameplay, but more like, you know, the wider kind of thing about gaming". Andrew pondered about the changes the course actually caused:

I'd say like yes and no [to whether anything changed]. No probably because I am just still going to play games, and I am probably not going to have... I am still going to play games and I am probably not going to start... I am not going to change the way I do it, but probably yes because even though it might not have a very big impact it might actually make me, like, every now and then I will think 'oh, have I think about it?' and it might, just, the little thing in the back of my mind or something,

just telling me that it's not as simple as I thought it was once. It's actually... there is a lot more deeper meanings behind all of this, and what we can take from it.

James also described how the course changed his view, illustrating with some of the topics covered:

It makes you think a lot more about games. Because before the sessions, you just pick up a game and think 'oh that's a game I can play and have fun', but after the sessions you think a lot more deeply into what is actually in the game. What you could be thinking while you're playing the game, like, tangential learning, people just do that, like, 'oh that's interesting, I will research it', they don't really think about why you are doing, or which games you could do that for. And with other things like addictiveness or female characters represented in games, most people just overlook that, but now we have been in the sessions, it's a lot more 'oh, that's a thing that happens', or 'oh, that doesn't have that very many girls or very many black people'. It's something you'd think a lot more now.

George shared a different view about what he had learnt, using a metaphor of a bubble to describe the influences of gaming:

I learnt something each week about it, because is a different aspect, not just the games, but the issues around the games. It's like, games are there, and all the issues are like a big bubble around it. And it's kind of we have just picked out four of these issues and we just talked about them and discussed them. So you kind of learn ins and outs of these issues. What people think about them? Are they really issues?

Harry, who also shared his desire to work with game journalism, found the course particularly useful. He said: "I think I became a lot more... I notice a lot more when I play games in general. In a general day. I'll thank you for that, because it's kind of the media I am interested... I am really doing it".

Aaron made a comment about his process of understanding games as a medium, comparing it to other media. He said:

It was good, I enjoyed it, it was interesting to study video games as medium, instead of just playing them. (...)I thought for a while, a bit, video games are equal with all the other forms of entertainment, like I know, like, parents will think that video games are just trash, but then they watch crappy TV and crappy films and read trashy novels. And I think that's better somehow. But this course has really shown me video games can teach. And they can make you think. And also, they are not addictive. Like, there is no reason not to play them. And I have never believed that they cause violent behaviour because I always have been able to play any game I wanted and I've not grown up any more violent than anyone else. But yeah, it really made me see that video games, you know, are on par if not better than films and TV and books.

Students were also asked whether they believed similar courses should be offered in schools or colleges. In this respect, Charles expressed his view that perhaps it should be more professionally oriented, only for people who aspire to have a career with games. David had a similar opinion, suggesting that game development could be taught as well. Samuel said it should be optional, because not everyone is interested in games. On the other hand, Nathan said that, “It’s certainly useful, but only for people who play games in a regular basis, really. But it probably encompasses quite a few, most of the population [laughs]”. Andrew said that even if students are not particularly interested, in the future they might, “Grow up and have children, they might think about, you know, what would their kids do if they play video games, like, you could give them opinions on that and give them a wider view”, which addresses game education as a more organic and informal process.

Harry and Aaron defended that students should study games just like they study other media. Aaron expressed this thought: “They have film studies and English literature is just book studies. And then there is music studies. Why it

shouldn't be video game studies?", and Harry emphasised that it feels like a media course, but media courses do not address games:

I think this would fit perfectly into a media course. I feel that it is a media course, but we don't really talk about games which is... so I think that would fit more like a media... which I think it should be shown in colleges.

The most recurrent idea about the course was its potential to counter the stigma of games. It was mentioned by six students: Logan, David, Thomas, Ryan, Aidan and George. Another understanding of game education as something that occur informally appeared in Ryan's words:

I definitely think it's a good idea because it's good to educate people about the positive things of games. Because a lot of people tend to think on them as quite negative and... so it's definitely good to educate people around the good things. So they can go on and educate more people and try to make it more positive.

While Aidan, in addition to comment about the stigma, commented that it also helps people to do accept that gaming also have potential negative aspects. He said:

I think having such courses for gaming is very helpful because as well as show you some of the negatives that do actually exist for gaming it does broaden your horizons in terms of the positives that exist in gaming.

George mentioned the stigma and also praised the experience, defending that schools should embrace the idea that many students like games:

I think it'd [the course] definitely have a huge turn out because it's an issue that is close to a lot of people. Because a lot of people play games and there is a lot of people interested in games. And there is a lot of people who feel quite strongly

about them. And it's like, it's quite good to just discuss and talk about the issues surrounding them, with, like, people that shares the same common interests with you (...) So it's quite nice to do it, and I think, like, in schools, if kids want to talk about games and that, they should be recognised as that's just what kids do now. Kids don't go outside anymore, they seat in the sofa and play XBOX.

Finally, James just expressed that he considered a good idea to offer the course, describing that it is important to “get people into the idea of games and what games are actually about rather than just having fun so I think they should be offered in schools and colleges, will be very beneficial for a lot of people”.

The survey answers in Likert scale allows for a comparison between the sessions. The two items assessed were of perceived *learning* and perceived *impact* in their gaming practice. The results can be found on the Table 16: Survey answers for each session. Please note that the table shows the number of students who filled each answers, accompanied by the percentage relative to the number of students present in the correspondent session. Also, the answers are shortened as SA (strongly agree), A (agree), NAND (neither agree nor disagree), D (disagree), SD (strongly disagree) and – (did not answer). Also, as it was described in section 7.3.5, the creation of mean values for a Likert scale solely aims to create a vague aid for comparison. Also, each session had two questions, one asking about what they had learnt, and another asking about the impact of the course in their gaming practices.

Table 16: Survey answers for each session

		SA	A	NAND	D	SD	-	Mean
Session 1	Learning	0	13 (93%)	0	1 (7%)	0	0	3.85

	Impact	0	7 (50%)	7 (50%)	0	0	0	3.5
Session 2	Learning	2 (17%)	8 (66%)	2 (17%)	0	0	0	4
	Impact	1 (8%)	8 (66%)	2 (17%)	0	0	1 (8%)	3.9
Session 3	Learning	2 (22%)	6 (67%)	0	1 (11%)	0	0	4
	Impact	0	5 (56%)	3 (33%)	0	0	1 (11%)	3.62
Session 4	Learning	3 (33%)	6 (67%)	0	0	0	0	4.33
	Impact	1 (11%)	4 (44%)	4 (44%)	0	0	0	3.66

From the Table 16: Survey answers for each session it can be noted that the majority of the answers are positive (i.e. agree or strongly agree). However, without a comparative parameter, this finding does not clarify much. The most important conclusion from the table is taken when the sessions are compared to each other. With regard to the perceived learning, the fourth session (excessive gaming) had the best mean, followed by both the third (violence and stereotypes) and the second (cognition), which had the same mean. The first session (tangential learning) had the worst mean. In the answers about perceived impact, the best mean was given to the second session (cognition), followed by the fourth session (excessive gaming), then the third session (violence and stereotype) and finally the first session (tangential), again with the worst mean. It should be noted that this conclusion about the rankings of

each session is vague, due to the small numbers and the method to generate a mean from Likert scale answers.

7.4 Discussion

The discussion is divided in five parts, like the findings. The first four sections refer to the four sessions of the RGC, and the last one discusses the study as a whole.

7.4.1 Session 1: “games draw a lot more inspiration from culture than I thought” (Andrew)

The findings of this study support an understanding of the relationship of students with the idea of tangential learning. In Study 1 and Study 2, tangential learning seemed to be a very common practice – not necessarily carried on frequently, but experienced at least once by most students. However, although they might conduct tangential learning, the idea might not occur to them when they analyse games, even when thinking about games and learning. In other words, they may occasionally practice tangential learning, but this is not typically reflected in their discourse and opinions about games. This conclusion was suggested by the fact that the game Rock of Ages (Atlus, 2011) had very blatant historical references, and students were asked specifically about the positive aspects of the game, about their opinions about the characters, and to explain whether they would recommend the game for a child. The potential of tangential learning was mentioned by only four out of fourteen students. The idea of tangential learning was not expressed by the other ten. Furthermore, four students commented about the learning potential of the game, describing what could be learned through game play, which arguably would be very limited, i.e. names of some historical characters. When they were asked in the classroom about what they had learnt with games, practically all answers were limited to learning through gameplay. Thus, in these cases, even when analysing the learning potential of games, the possibility of the game to inspire external learning was not taken into account. Contrastingly, after the course most students played the game and perceived the potential of tangential learning in Rock of Ages.

Other topics associated with tangential learning were perceived differently. One of the emphases of the course was to discuss an expanded understanding of tangential learning, which goes beyond the historical and mythological elements that frequently come to the minds of players. However, this aspect appeared more timidly in the interviews in the end: only three students took into account the potential – or lack of potential – to inspire tangential learning of the game Tales of Monkey Island.

The connections that students make between game elements and classroom topics, which were investigated in Study 1 and partially abandoned thereafter, re-emerged in this study. In the interviews before the course, two students spontaneously commented about this possibility and the potential to support future learning. It was briefly addressed in the first session with the participation of five students, while two of them incorporated this idea in their discourses in the interviews in the end. It suggests that although this topic might not be widely present in the practices or perspectives of most students, the idea does reverberate in some students who notice those connections and find them relevant to some extent.

In this study I also addressed specifically, even though with a secondary emphasis, a perspective that see games as cultural artefacts, thus being related to other elements of culture as other media and art. Other proposals of game education also address this aspect of games (e.g. Buckingham and Burn, 2007). This kind of perspective was commented upon by five students in the second interview, in addition to students such as Aaron and Harry who seemed to have strong opinions about it. The topic seemed to be relevant and well received by students. Topics such as tangential learning, connections between classroom and game themes, and games as cultural artefacts all lead to an approximation between formal and informal learning (Sefton-Green, 2004), which can make both more meaningful.

With regard to the classroom activities of this session, this study reinforces something that was suggested by Study 2: that students struggle to think about new game topics to search, which they had not searched previously. Talking

with the external observer about the possible reasons why it occurred, a few tentative explanations and insights about the topic were formulated:

- (i) it is much easier to remember of activities one had done than activities that one thought about doing or had not even thought of doing;
- (ii) the richness of tangential learning practices is based on the curiosity and motivation that spontaneously emerge from the gaming practice. To ask students to artificially create this curiosity and desire to search for something when they are not engaged with games is not really quite comparable to spontaneous tangential learning;
- (iii) perhaps when I asked students about their prior experiences of tangential learning, they were sharing with me potential tangential learning topics, and not ones they had actually searched. In other words, perhaps students were just remembering games that they like and thinking about topics in them that could be searched. Consequently, if it were the case, when I asked about new topics they had not searched about before, the question did not make much sense because they were already telling me many topics that were only potentially searchable.

In any case, students also suggested that the session was too much based on discussion, therefore for a similar cohort of students future tutors would have to face the dilemma of proposing an activity that perhaps does not make much sense to students, skip the tangential learning activity and lead a monotonous session, or create an alternative activity. Some possibilities of alternative activity would be to have a gaming session and ask students to find tangential learning potential in the game, or use the idea that emerged spontaneously in Study 2 about searching for sources that make commentaries about the cultural elements of games, e.g. an article discussing the historical accuracy of a specific war game, instead of searching for the topic independently. Perhaps this activity would sound more novel for students, but it would have to be tried out.

7.4.2 Session 2: “Though I kind of question how logical some of the things you do are” (Aidan)

The findings suggest that the topic regarding cognition and problem solving are perceived differently in the abstract and concrete levels. In the first session, when asked about what they had learnt, they were able to formulate specific answers, e.g. team work, patience. However, students from both courses seemed challenged when these abstract ideas, e.g. “playing games develops team work”, needed to be associated with concrete contexts. In this study it was evident not only during the classroom, when they struggle to associate abstract skills with concrete games and contexts, but also in the interviews: in the first interview, the few students who mentioned anything in this regard tended to remain in an abstract level, e.g. “stretching the mind”, rather than being able to associate the abstract concepts with the concrete example of the games. In summary, it seems that students sometimes welcome a relatively vague idea that gaming can make players smarter somehow, but that this does not necessarily be associated with the concrete games they play. Although their answers were often more sophisticated with those regards after the course, in the case of Andrew, Harry and Logan, the pattern seemed to remain. They mentioned how much they learnt about the topic at an abstract level, but when they were asked to answer about the two concrete games, those ideas were not expressed. In the case of Nathan and Joseph, their opinions at the end remained generic, such as “developing the mind”, even though they were referring to specific games.

The results of addressing these vague preconceptions presented seemed to vary. On the one hand, there seemed to be a tendency of students who began the course presenting some scepticism to reinforce this scepticism, giving little relevance to the claimed benefits that gaming can generate. It seemed to be the case of Charles and Thomas. On the other hand, students who were more enthusiastic about the benefits tended to end up the course more confident of their beliefs, capable of elaborating more complex descriptions of them. This was the case of Samuel, Aaron, James, and Aidan.

Another aspect involved in the course is the difference between a naïve and a critical approach to those benefits. It is true that some students made some comments in the end that suggested some criticism, such as Andrew and Aidan, and other students said nothing in this regard, which might mean that they ended up the course disregarding such claims as actually relevant to their gaming practices. However, arguably naïve understandings were also expressed, in particular in the classroom interactions, like, for instance, when Nathan suggested that playing *Solipskier* would develop the skill to plan ahead, consequently being useful to plan a date. A critical approach to the topic seems to be the main challenge of this session, and although this version of the course tackled it directly, it seems that in future versions it could be further emphasised.

7.4.3 Session 3: “Woman Hitler” (Joseph)

The topics of violence and stereotypes were received differently. When it comes to violence, it seemed more commonly accepted to hold a perspective that is critical to sensationalist media while at the same time considers that age restrictions to violent media have a rationale, implying that representations of violence can be problematic for users to some extent. This middle ground opinion was exposed by the video and remained uncontested. No student was found to be at the extremes, either believing that violent games are undeniably the main cause of the shooting scandals in the United States, or judging acceptable to give overly violent media to young children. Therefore, the topic of violence was addressed smoothly in the classroom when compared to stereotypes. Although some journalists and researches occasionally hold extreme positions with this regard, the findings do not show students doing the same.

However, as in Study 2, stereotypes raised the temperature of the classroom, especially gender stereotypes. The interviews before the course showed that students were not aware of any potential problem of the use of the recurring damsel in distress plot, which is blatant in the scene they played. Even when asked directly about the characters, Elaine was completely ignored, with the exception of a mention by James and being praised by Harry. However, it was

in the classroom that the need to further address issues of gender became evident. Some problematic ideas about gender were expressed with apparent agreement of students, or at least no resistance; ideas which hardly could be properly problematized in the classroom with the limited time of the course. These ideas were, for instance, that Bayonetta (Sega, 2010) is not sexualised because she is too tall to be sexy, that sexualisation occurs equally for male and female characters in games because women are sexualized through their bodies while men are sexualised through heroic actions, etc. Contrastingly, in one of her videos, Anita Sarkeesian described Bayonetta as an “overly oversexualised adolescent male fantasy” (Feminist Frequency, 2012, no page). Even after the topic was introduced, the reactions were mostly defending or justifying the game industry, and there was resistance to admit that there is a problem in the representation of women in games.

This was hardly surprising. The trajectory of Anita Sarkeesian since she began to point out sexist elements in games found recurring defences of the game industry and responses full of hatred, death threats, and scorn by a community that apparently has many members who seem incapable of criticising the problematic aspects of games while simultaneously praising the virtuous ones. Although the reaction of students of this study was not as aggressive as some of the haters of Anita Sarkeesian (possibly with the exception of calling her a “woman Hitler”), the episode seemed to reproduce the same pattern in a less extreme form. That, found in an environment of well-educated students, within society that is comparatively praised for gender equality, adds to the argument of critical (Kincheloe, 2008) and feminist (hooks, 1994) educationists that there is an emergency to address gender in schools. Furthermore, in terms of game education, this study resonates with the argument that gender should be discussed (Newman and Oram, 2006), in particular gender representation (Madill and Sanford, 2007).

However, the findings also suggest some optimistic conclusions. Six students expressed in the end at least some concern with gender representation in games, including the more emphatic critique of Samuel to the scene. It may seem little, but the topic was addressed for approximately half an hour.

Furthermore, despite some initial problematic ideas about the topic, students seemed fairly open to discuss it. They engaged enthusiastically in the discussions and in the video; they seemed interested in the research in the area; all the activities manage to engage them; and after all they asked for more: many students said the session should be longer, as well as other sessions. Moreover, even though there was debate and controversy, and some of them had criticisms towards the main video, their answers in the survey were similar to the others. Most of them agreed that it made them think differently to some extent. In other words, not only feminist and critical scholars want to create educational environments to discuss gender and sexism; many students are eager to it as well.

7.4.4 Session 4: “It is your personal choice to play it. The game doesn’t force you” (George)

Given in Study 2 this session did not happen as intended, Study 3 was the first opportunity to run a session about excessive gaming, so this session had less chance to be developed than the others. The video *Game addiction (part 1)* (Extra Credits, 2010) seemed to engage students and send a clear message. The authors are gamers defending the position that although the media can often exaggerate about the problem of excessive gaming, it is better for gamers to admit that many people indeed play excessively. However, some students seemed to grasp the catchy idea that “games are not addictive, they are compelling” as the main message from the session, which was not intended. In academia, although the term addiction applied to games is sometimes contested (Wood, 2007), it is widely employed in research (e.g. Grüsser et al., 2007). The current study, however, poses a different question. Which word better encourages players to successfully self-regulate their gaming practices: compelling or addictive? On the one hand, to perceive games as compelling seems to move the responsibility and agency to the player instead of blaming the game alone, which is more in accordance with the empowering principle of the ICEED model, which relates to the possibility of players acting and changing their realities. On the other hand, to perceive games as compelling might lead the participants to see the whole problem of excessive gaming less

of an issue, thus discouraging self-regulation. This study does not really respond which concept is better for students, but showed that the video sent this message clearly and students seemed to grasp it and appreciate the new perspective.

With regard to the discussion expanding the ideas about the compelling elements, students participated actively in this discussion. It had an ambiguous message, because the elements that stimulate players to play excessively are roughly the ones that also make the experience enjoyable. Therefore, it also became a discussion about what makes a game a good game, in terms of enjoyment. Although some students did comment about the compelling elements of games as something that can lead to excessive play in the last interviews, arguably most students were already capable of talking about those elements in the beginning, as their discourse about games were filled with ideas regarding the enjoyment elements of games. It may be that deepening students' understanding of the compelling elements of games is more justified in game education proposal aimed for future game professionals, such as in Zagal (2010), but in the current proposal it seemed displaced from the original focus of the session, which was excessive play.

The other aspect, which perhaps could be more emphasised in future is the reflection and support of self-regulation, as it was expressed in the pedagogical aim *reflect about ways to prevent excessive gaming in their practices*. This reflection was not elaborated during the session; when I asked about whether they had self-regulation strategies, they had no answer, and ironically only Aaron, who declared to play the least from all students, gave an answer. In talking with the external observer, we concluded that a less personal approach could help students to disclosure those ideas, such as "let's think about strategies that players in general could use to avoid playing more than they intended". Furthermore, perhaps some specific material could be discussed, such as the game proposal of Klimmt (2009). Despite my criticism of his approach that aims to protect players through offering a normative gaming practice, his ideas about avoiding excessive gaming could be insightful if discussed with students in a non-directive manner.

7.4.5 General remarks

This iteration of the RGC was far less problematic than the first version of the RGC. There were mistakes and activities that I would rather do differently, but that is the nature of an iterative process: it could go on for many cycles of adjustment, generating new questions as well as answers. However, the problems of the current implementation of the RGC were minor compared to the first course, therefore illustrating a successful implementation of the improved version of the RGC.

The set of activities chosen seemed to work well. There were a few cases which still had no clear solution, such as the tangential learning practice in the first session. In other cases, there were minor implementation problems that were probably just my lack of experience, such as avoiding small group discussions in the first session. However, in most cases the RGC seemed to work well. With this regard, drawing students' previous experiences, opinions and knowledge was a rich experience, as students showed that in most cases they have comments to make and they want to share and discuss them. Furthermore, the videos selected worked very well. Obviously, to use many videos was only possible because of their availability, which highlights the value to this project of channels such as *Feminist Frequency* and *Extra Credits*. The work they and a few others do to popularise relevant discussions can be considered an approach to game education which, intersecting with the themes (or propositions) of this thesis, takes into account the influences of gaming.

One of the novel questions for students was whether they believed the course should be offered in schools and colleges. It generated some interesting opinions that reveal how much games are underestimated as a medium by schools. However, the most interesting finding was the number of students who saw the course as relevant to counter the social stigma that surrounds gaming. This is a reminder that a game education proposal can be seen as a response to a situation that students perceived: that most people are, in fact, quite uneducated about gaming.

This study and Study 2 offer a detailed description of the designed activities and the empirical investigation of the RGC, which allows researchers and practitioners to reproduce a similar or adapted version of the course. Together, both studies answer the third RQ (How is the Reflective Gaming Course experienced by learners?) by offering a lengthy description of the findings generated by the students' responses to the course.

Studies 2 and 3 also showed how the ICEED Game Education Model can work in practice. The findings showed that this proposal can be engaging for students, that they are keen to discuss game related topics – even students who are not highly engaged with games, as some of the richest participations of the course came from the least intensely involved with games, such as Aaron and James. Also, the findings suggested that in a relatively limited amount of hours students had the chance to develop their perspectives upon games in general and regarding many specific topics. In other words, the studies described the outcomes of the course for learners, which is the RQ4 (What are the outcomes of the Reflective Gaming Course for learners?). Even though some of the outcomes seemed clear (e.g. students apparently incorporated tangential learning in their discourse), in other cases the course only scratched the surface of topics that are complex and multifaceted (e.g. gender representation), hence more difficult to pin down.

Furthermore, thinking about the course as a whole, self-reports indicate that it made students perceive gaming more as a complex activity, embedded in culture, comparable to other media, bombarded by contradictory and sometimes unfounded discourses, and, similarly to many other activities, have positive and negative aspects that can affect other spheres of their lives.

In terms of research practice, all methods appeared to work well in this study. The main innovation when compared to Study 2 was the set of two interviews for each student, which included game play and questions about the games. This method did produce much findings and evidence about their discourses and how it changed. However, it has limitations. Probably the main one was that instead of assessing the changes in their perspectives about games, perhaps the changes were due students becoming aware that the topics that interested

me were actually only the influences of gaming. To illustrate this, possibly if the mother of Samuel asks him today about his opinions about the characters of a game, he will completely ignore the gender discussion. In other words, perhaps he only took gender into account because he knew what I was expecting, while in the first interview he did not know. However, despite this bias, the findings were revealing about how students interpreted and expressed in their own manner the topics of the course.

Did students' gaming practices change after the course? Clearly, the lack of follow-up studies prevents concrete conclusions to be taken about the ways they have changed their gaming practices. However, the findings suggest that many of them changed their *discourse* about gaming, and opened their eyes to aspects of gaming they had not considered before. In addition to change their discourses, the findings suggest that students developed their capacity to reflect, discuss and make judgments of games, which is neatly illustrated by a quote of Aidan: "when you put all the session elements together, you can determine whether a game is actually valuable or rich". Although it is naïve to assume that students will change their practices literally as they described they will, arguably it is similarly naïve to believe that all the changes in their discourses described in the findings will have no impact in their practices.

8. DISCUSSION

This chapter describes discusses the findings of the whole thesis in three parts: players' perspectives, ICEED Game Education Model, and Reflective Gaming Course. Then, it describes the limitations of the thesis and closes with the concluding remarks.

8.1 Players and the influences of gaming

Study 1 investigated the perspectives of 15 players on the influences of gaming. In Study 2 and 3 I also had the chance to interact with players and discuss the influences of gaming: the RGC was offered twice, involved 22 male students, 37 interviews, and nine course sessions over the two implementations. Throughout the thesis I answered the first research question (i.e. *How do players understand the influences of their gaming practices?*) by describing several points of view, personal experiences, opinions and knowledge that players shared. What follows are reflections upon all those findings. In the three studies players revealed (i) similarities, (ii) differences, and (iii) special cases.

This research made evident some *similarities* between players, the main one being the absence of the influences of gaming from players' perspectives. It is true that there were exceptions, but the three studies found that many students have little knowledge or vague notions about the influences of gaming. It is, however, a positive context for education; because there are prior perspectives that the educational practice can work upon, but those perspectives also have much potential to grow, to develop, to become more critical. This potential is also suggested by the fact that, although in Study 2 and 3 a minority of students declared that they were well informed in the beginning, most students claimed to have their horizons widened with regard to the influences of gaming. However, all students seemed able to engage with the topics and make sense of them, because it was not completely alien from perspectives they already had access to. Study 3 highlighted the difference between pre and post perspectives of players, suggesting how much it can change after a brief intervention.

There are two phenomena associated with gaming that the thesis offers particular insight to what concern the players' perspectives. The first one is the *connections between game topics and school topics*. The findings suggested that, in general, those connections were not widely present, and were found to be of little relevance to players. Conversely, the findings also have shown cases in which the connections were considered important. Therefore, although it seems to be not widely perceived as important, the phenomenon can be further investigated as something that a minority of players find relevant to their gaming and schooling practices. In contrast, the second phenomenon was *tangential learning*. Despite its reference in some works (e.g. Iacovides et al., 2014; Turkay and Adinolf, 2012; Whitton, 2014), this topic was a lot less elaborated in academia than, for instance, cognitive gains. However, the three studies of the thesis suggested that players very often have multiple concrete experiences of tangential learning, and value them. It was evident from the descriptions of tangential learning in Study 1 and also from students' engagement with the first session of Study 2 and 3. Those findings sum up to other studies that asked players about learning and found out that tangential learning is a key aspect of it (Turkay and Adinolf, 2012; Iacovides et al., 2014). It adds to the studies cited by making evident how players describe their own practices in terms of tangential learning.

With regard to the *differences*, Study 1 suggested something that I found in Study 2 and 3 as well: there is a great variety of players' perspectives about the influences of their gaming. It should not be surprising – considering that the influences of gaming are complex topics and very little instruction about it is available – that heterogeneous opinions and beliefs would emerge. But how can those differences be understood? In the three studies I conducted interviews with players and talked with them about how they relate to the influences of gaming, and by immersing in their discourse and reflecting on how they could be characterised, I found that five elements of gaming are particularly relevant to understand their differences.

- (i) The first one is *knowledge*, referring to knowledge acquired by learning in non-gaming contexts such as an article in the news.

Although in all studies I focused on the influences of gaming according to players' gaming experiences, knowledge that apparently originated from other sources occasionally emerged. Some illustrative examples of players who demonstrated prior knowledge were: Aidan (Study 3), who made a sound criticism about the literature about violence and gaming, Peter (Study 1) who commented he had read studies about problem solving development and gaming, or Harry (Study 3) described he had written an article about Anita Sarkeesian to be published in a website. However, there are also examples of students not knowing. There was an absence of many topics discussed in Study 1, but also in the other studies there were examples, like Harry (Study 3) saying he had not thought about how he was using his mind and brain while gaming, or Logan (Study 3) saying he had not thought that games could promote learning.

- (ii) The second is *awareness*; which here I differentiate from knowledge by using the term awareness as knowledge acquired by attentive gaming and reflection, in contrast to reading or being told. Some students might perceive influences in their gaming practice that they know nothing about, or the opposite: not notice influences that they do know about. Some examples of awareness apparently without knowledge are when Oscar (Study 2) described learning English playing Pokemon; Nash (Study 1), who said he began to be attracted to different kind of women; or Hanna (Study 1) when she described learning to be more competitive. These descriptions do not seem to come from learning from external sources, but by observation of their own practices. Contrastingly, there are cases such as Peter (Study 1), who said he read about cognitive improvements through gaming, but was not aware of whether it had happened to him. There are also examples of the third person effect, like Jack (Study 1), who said that violent games make people violent, but he was not aware of it happening to himself despite the fact he plays violent games. Another example of awareness was Oscar (Study 2), who declared observing what kind of benefits a

game provides when he plays a game for the first time, saying that he would “notice these things by, before, when I picked up the game. I played, and like: “oh it does that”.

- (iii) The third is *scepticism*. It is possible that a player knows about a claimed influence or perceives the potential in her/his practice, but is sceptical about its relevance or usefulness. Like Gary (Study 1), who said the knowledge acquired playing games was not useful in other contexts; Adam (Study 2), stating that stereotypes in games have no impact outside of the game; or Andrew (Study 3) who said “I realise that games can improve skills, but I also know that it can be very situational and not necessarily useful”. The opposite of sceptical perspectives of the influences would be the complete lack of scepticism, which could be called either a celebratory or an overly pessimistic view. In other words, beliefs that gaming has huge influence on players, being good, bad, neither or both. There were also examples that sound celebratory, such as Lewis (Study 1) and his description of intelligence boost due to gaming, or Billy (Study 1), who said he learnt more history with games than with history classes in school.
- (iv) The fourth is *concern*. In other words, while some players are interested in the influences, others *just don't care*. There are examples of students who find the influences very relevant; like Lewis (Study 1), who thought about the influences of gaming in order to justify his gaming practices to his parents, and also declared he sometimes chose games because of their potential to educate him. Or Christopher (Study 2), who wanted to write to the game companies to complain about the sexist and racist representations in games. Contrastingly, Harley (Study 2) said he doesn't care about the influences of gaming; he just wants to play to have fun. Charles (Study 3) and David (Study 3) said the same with regard to problematic representations of games: that they don't care. They want to view games as “just games”.
- (v) The fifth is kind of *gaming practice*, referring to what players actually do with games. Although in all studies I described the

gaming practices briefly, it was evident that players undertake very diverse practices. The games played can be of genres, but in addition to that their wider engagement with games can have peculiar characteristics. For example, Billy (Study 1) tries to understand the mechanics behind the games he plays, Nash (Study 1) actively compares the knowledge from games with knowledge from school; Harry (Study 3) writes a blog about games.

I am not the first author to make a call for a complex approach to the influences of gaming. Quandt and Kowert (2015) and Steinkuehler (2015) argued for a complex approach that takes into account what players do with games, the context and social interactions around it. However, the other four elements I described (i.e. knowledge, awareness, scepticism, concern) were not considered.

These five elements describe the possibilities that players have to change the influences of their own gaming practice. Therefore, by researching them, researchers can better understand how to support players to make the most of their gaming practices, if they wish. Consequently, our understanding of the influences of gaming can avoid a fatalist, paternalistic approach, and embrace an empowering one. In that way, research about the influences of gaming can consider how the knowledge generated can allow players to make something of their gaming practices in concrete ways.

These five elements are also very relevant to the game education model here proposed. If only the fifth element is considered, game education can aim to change the gaming practice of students. It can be done in a protective way, by telling students what not to do (Klimmt, 2009), or in a creative approach, for instance by teaching students to create games (e.g. Buckingham and Burn, 2007). Arguably, the more game education proposals aim to change the gaming practices of students, the more they aim to colonize students' leisure time with school-endorsed ways of playing. On the other hand, if game education models aim to empower students to think about their gaming practices differently while respecting their possibility to play games in the way

they prefer, focusing on *knowledge, awareness, scepticism* and *concern* about the influences of gaming can be part of a solution.

These five elements also offer a different perspective to research player differences with regard to the influences of gaming. Studies that research player differences (e.g. Kallio, Mayra, Kaipainen, 2010; Albuquerque and Fialho, 2015) normally do not take this into account. Consequently, the five elements also open possibilities of research that aim to understand the knowledge, awareness, scepticism and concern that players already have. This would support new proposals of educating about the influences of gaming.

In addition to the player differences explored throughout this thesis, several *special cases* were also revealed. Although they do not describe a wide tendency, special cases show us potential ways to interact with games that can make us see games from new perspectives, or think about gaming practices that could be encouraged. Examples of this are Lewis' (Study 1) father, who encouraged him to think logically when playing and to challenge himself; Billy (Study 1), who tries to understand the mechanics behind the game; Carl (Study 1), who plays Civilization 5 (2K Games, 2010) and sees very little or no relationship between it and school content; Adam (Study 2), who read *the Prince* by Niccolò Machiavelli after playing Assassin's Creed (Ubisoft, 2007). The special cases described throughout the thesis allow researchers to look at games from different points of view, and have the potential to cast light in the blind spots of academic knowledge. On the one hand, the examples show possibilities that counter generalised beliefs, thus emphasising that oversimplified descriptions of how players with gaming cannot be taken for granted (e.g. not all Civilization players see its connection to history lessons). On the other hand, they show exceptions that potentially can become more common if those cases are stimulated (e.g. more parents can behave like Lewis' father if support is given to this kind of parental game education).

In conclusion, this thesis described players' similarities (with particular emphasis in the absences), elaborated in the particular topics of tangential learning and the connections between game and school topics. It went to describe players' differences (including five key elements to conceive the

differences with regard to the influences of gaming), and a variety of special cases (which can inspire new points of view about gaming). The thesis describes the possible forms in which the influences of gaming can be present or absent of players discourse, highlighting that in most cases some influences of gaming are present in the imaginary of players, but apparently has minor relevance and very little opportunity to develop complex reflections about it. By describing and discussing these aspects of players' perspectives, this research offers reflections about how we understand players when it comes to the influences of gaming, making explicit the richness of the diverse forms of engagement with games.

8.2 The ICEED Game Education Model

The ICEED (informative, critical, empowering, emancipatory, dialogical) Game Education Model developed and evaluated in this thesis used other game education models as a foundation to suggest this novel model. It was developed as an answer to the RQ2. How can reflective gaming be taught? Clearly, there are many ways that this research question could be answered, and the ICEED is one in accordance to the literature I used as a framework. In the literature review I outlined some of the *needs* expressed by various authors, such as the need to develop pedagogical practices that connect media formal and informal learning (Sefton-Green, 2004; Fantin, 2010), the need to approach games in school in a perspective which is critical, rather than one-dimensional and defensive (Buckingham, 2007), and the need to problematize with players the content of games in terms of sexism, racism, etc. (Madill and Sanford, 2007). I argue that this thesis responds to those needs, but it also goes beyond them by generating fairly new perspectives on game education, which is expressed through the ICEED Model. Thus, the model has the potential to offer insight to game education scholars and to help to build a wider framework composed of multiple game education proposals.

Clearly any model has to make compromises, hence the ICEED model emphasised some aspects to the detriment of others. Arguably, this model can be operationalised with little resources and can generate results, as it was seen with the Reflective Gaming Course. It could be expanded, but it could also

work in shorter interventions, as each session could work more or less independently. It is an important factor because the possible contexts in which teachers might want to offer similar courses vary. One teacher who have plenty of classroom time and preparation opportunities could offer an extended game education course based on the ICEED model, but the model also allows for shorter interventions that might have to find its place in contexts where time and resources are more limited.

There were player statements to suggest that the five dimensions of the model were present and perceived. The RGC was

- (i) Informative: by employing academic papers and ideas as a basis for instruction about the influences of gaming. This informative aspect was perceived and expressed in comments such as Aidan's (Study 3): "it gave the extra knowledge to be able to do so from like, a beneficial standpoint", or Henry (study 2), "it is quite a lot more to gaming than originally thought".
- (ii) Critical: by creating contexts where students could challenge dominant ideologies of gender and race present in games. There were some evidence that the course triggered critical reflections, such as when Ewan (Study 2) said:

It is kind of... new perspective. It makes you look things like in a different way. Because, like, when we were talking about how there is always a male hero. I never really thought about that. I never... it never came across my mind. (...) it's kind of sort of to do with how you... what you grown up with... because then you think it is normal. Don't you? Because it is kind of what you are used to.

Nathan (Study 3) also illustrated a reflection triggered by the course: "I guess since it's mocking these stereotypes it could be the slight message of these stereotypes are just silly and bad", referring to Tales of Monkey Island (LucasArts, 2009).

- (iii) Empowering: by stimulating students to reflect about opportunities to act upon their practices. Like when Christopher (Study 2)

described how he realised that “you learn more about the game by actually researching it and going more in depth towards the game as well”, therefore having insight about how he can change his own practice. Or when Harry (Study 3) described he began to play differently by perceiving and contesting stereotypes:

I was playing Dragon Age Inquisition quite recently and one of the parts which you have to go and save a woman. And while also this woman was completely in a bikini and just sat there, ‘oh that’s a lot more standing out’. Like, if it were two or three years ago I’d like, that’s kind of normal. But it is a lot more blatant obvious.

- (iv) Emancipatory: by promoting informed discussions about the topics instead of imposing a discourse of real beneficial play. Many students felt free to express their disagreements with the main views about topics, their lack of concern, or their own interpretation of things. The course was normally described as a chance to develop ideas, widen the ideas, and to be educated, and not as an imposition of a normative approach. For instance, George (Study 3): “it’s quite good to just discuss and talk about the issues surrounding them”, which describes game education as a process based on discussion, and not of delivery of content.
- (v) Dialogical: by having almost all topics linked to the games students play. The value of this link to the players’ practices can be seen in George’s (Study 3) words:

I think it’d [the course] definitely have a huge turn out because it’s an issue that is close to a lot of people. Because a lot of people play games and there is a lot of people interested in games. And there is a lot of people who feel quite strongly about them. (...) So it’s quite nice to do it, and I think, like, in schools, if kids want to talk about games and that, they should be recognised as that’s just what kids do now. Kids don’t go outside anymore, they sit in the sofa and play XBOX.

His ideas reflect the calls from the literature to create spaces that link formal and informal learning and practices (Sefton-Green, 2007; Buckingham, 2007; Fantin, 2010).

The empirical investigation also offers cases where the dimensions did not work very well, or were not well received. For instance, Oscar (Study 2) and Aidan (Study 3) declared that they were well informed about the topics addressed in the course; therefore the course was not as *informative* for them as supposedly it was for others. This problem is difficult to solve in groups that are heterogeneous regarding what people know, as Study 1 suggested it could be the case in groups of players. The *critical* aspect of the course was not always welcome either; for example, Adam (Study 2) and David (Study 3) said they do not care about representation issues, the former also being vocal about his hatred against Anita Sarkeesian. However, the fact that sometimes critical issues did not raise interest or were radically opposed by the participants does highlight the need and relevance of the creation of more and better spaces where critical topics can be addressed. Despite the above cases in which the informative and critical aspects of the RGC were not applied smoothly, the principles are not less valuable because of them. These difficulties just showed some parts in which the RGC could be improved to better meet the principles, such as through ways to tackle the initial heterogeneous knowledge and the resistance of some students have to engage in critical thinking.

The RGC is, however, only one implementation of the ICEED model. Future research can investigate other pedagogical practices, as well as forms of parental support to more reflective gaming practices, or media-based support. In either case, the model could be adapted to fulfil the contextual needs. For instance, parental forms of support can more easily address the specific games that children are playing, therefore the idea of a dialogical process between formal and informal makes little sense, because the whole process is contained within the informal scope. On the other hand, parental relationships allow for (and often require) more control upon children's gaming practices than educators would normally do; which would have implications to how the concept of emancipatory is understood. Similarly, media-based game

education (e.g. YouTube channels such as *Feminist Frequency*) will present other affordances. Yet, the ICEED model can be used as a flexible reference of how game education is conceived.

8.3 The Reflective Gaming Course

While Design Based Research projects aim to build and inform theory, they are also concerned with practice. The practical aspect of the thesis is the RGC, which on the one hand answered the specific research question *how can a specific course implement these characteristics?*, and on the other hand allowed me to investigate the third (*how is the Reflective Gaming Course experienced by learners?*) research question and the fourth one (*what are the outcomes of the Reflective Gaming Course for learners?*). Based on the responses of these research questions, what are the practical lessons learnt about how to conduct the RGC? The next sections present my final reflections about each part of the RGC.

8.3.1 Tangential learning

Tangential learning was the opening topic of the course, and it was chosen because it was short enough to share a session with the introductory activities (e.g. students sharing their names), it related well to students' prior experiences and it opened the course exploring a positive aspect, thus avoiding initial judgements that the course was designed solely to warn players against the evils of gaming.

The topic of tangential learning seemed to raise students' interest, and allowed them to share many prior experiences of tangential learning. Apparently, the session motivated some students to conduct tangential learning more often and to do it more consciously. The extreme case was Samuel (Study 3), who said he became *addicted to learning* about the game theme (mythology), and although arguably it could be seen as a negative or extreme impact of the course, it illustrates how students can be inspired by the course to learn.

Despite some examples of authors that touch on tangential learning (Iacovides et al., 2014; Turkay and Adinolf, 2012; Whitton, 2014), academia has given

more attention to other influences of gaming (e.g. cognitive gains) than to tangential learning as such. One of the activities of the course was to discuss the diversity of possibilities of tangential learning, for instance, learning about a historical reference (e.g. the Crusades), an abstract concept (e.g. Schrodinger's cat), or a cultural reference (e.g. the Hobbit), etc. What I have done in those discussions with students was to describe a simple *taxonomy of tangential learning*, in order to broaden students' understanding of future possibilities. It would probably be beneficial to the course if I had had access to academic resources that would support this discussion beyond my own reflections on the topic. Arguably, due to the absence of much academic exploration of the topic, this session was the least based on academic writings, which suggests potential to improve it if academic studies are somehow incorporated in the session.

Although the video and discussions about the topic seemed to work well, the two iterations were not enough to clarify the best approach to the activity of conducting tangential learning in the classroom as it did not work as well as hoped. There are possibilities of explanation why the activity did not work as well as expected. Perhaps tangential learning works well as a spontaneous practice, and when an artificial version is proposed it makes little sense for students, or requires more time. Alternatively, perhaps the examples students shared already included *unsearched topics* in addition to the ones they had actually searched (in which case to think about the unsearched separately would make little sense). Some alternative practices would be to reserve more time to do it, to search for *commentaries* of game references instead of the references themselves (e.g. the article *Assassin's Creed and the appropriation of history* in *The Guardian* (Stuart, 2010)), or to suggest that new tangential learning practices could be the “homework” for the next session.

The simplicity of the concept of tangential learning as it is expressed in the video used makes it particularly valuable, because it does not demand much training from teachers or parents who want to address the topic. Another way of seeing it is as a simply curious look at media artefacts, in order to consume them richly. In parental relationships, it does not sound very demanding for

parents to occasionally ask their children what the games they are playing are about, and then encourage them to go further and learn about it. To people who live in a jungle of cultural references, this simple habit can enable media to be personally enriching. Aaron (Study 3) told me that he thinks “tangential learning is what actually makes people intelligent”, which I interpret as his way to rejoice in the value of curiosity, which is the essence of this session.

8.3.2 Cognition and problem solving

The session on cognition and problem solving could be considered a continuation of the first session, as they both address learning and gaming; in fact, some students occasionally seemed to mingle both sessions in their memories after the course.

This topic covered the most prominent claims about the positive influences of gaming, which echoed some students’ prior beliefs. Study 1 had already suggested that cognitive gains and problem solving skills are ideas that are present in the discourse of many players, at least vaguely. One aspect of the session presented those ideas and reinforced students’ beliefs about it, which is probably the simple part. Many students seemed to grasp easily that playing games has the potential to improve attention, spatial cognition, etc.

The challenge was to bring concrete and complex perspectives on the topic. In other words, to ask students: what are the potential skills developed by the games you play, and how those are concretely useful when you are not playing? Clearly, students did not have the instruments to give a definitive answer, but the reflection aimed to encourage a more complex understanding of those positive influences that recognises its limitations: they are dependent upon the games played, they seem to have limited scope of transfer, and even in the long term they seem to have limited concrete result in players’ lives.

If students are aware of the skills they are employing while playing games, they could occasionally reflect about the skill set they are using, potentially changing their gaming practices to accommodate whatever they wish in terms of cognitive involvement and problem solving skills. However, the literature in the area gives little support to this kind of decision-making. As I have argued

before, the influences of gaming often seem to be perceived as a topic of interest for policy makers, parents, teachers, and clinicians, more than the interests of players themselves. Probably the more that scholars explore the question, “*How can research on cognitive gains and problem solving inform players’ decision about their gaming practices?*” the more scholarly this aspect of game education can become. In this thesis I have built a wooden bridge between academia and players in the hope that one-day stone bridges will be built.

The activities of this session that encompass game analysis regarding the cognitive and problem solving skills were fairly unstructured. Students were asked to associate games with skills and examples of use of the skills, based on the examples we had discussed and the video we had watched. This activity could be further developed; the section on skills developed of the analytic table proposed by Felini (2012b) is a tool that can be used for this purpose, even though I believe that there is potential to improve his table, especially if further research clarifies the role of the player in deciding her/his cognitive forms of engagement.

The outcome of this session of preparing students to take informed decisions about the games they play, as was intended in Studies 2 and 3, has a limited rationale. It is arguable that this kind of informed decision-making is a very sophisticated process. And even if players are well informed, there is not much research addressing how players’ decisions and perspectives can determine the influences of their gaming. Consequently, a question remains: is it realistic to aim to prepare players for effectively taking this kind of decision, in a way that has concrete impacts for their gaming practices? Further research is needed to answer this question, but my research does not suggest an underestimation of students. In Study 3 research topics entered the classroom discussion: we talked about causality, transfer, and confounded variables. Consequently, my research cannot tell whether it is possible or realistic, but it points to the potential with optimism, summing up voices with Felini (2012a), who described the potential of players engaging with games in a sophisticated manner.

The other outcome from this session was apparent when students felt that we were fighting stigmas about gaming – or preparing students to do it afterwards. It was perceived in other sessions, but this one seemed to approach the quintessential positive sides of gaming. Perhaps fighting stigmas is a more concrete outcome of this session, which is closer to what Aglieri and Tosone (2012) proposed in their workshop to parents. Although this sounds like a concrete valuable outcome of this session, I believe that a cautious approach to the topic should also avoid the encouragement of exaggerated opinions, such as the positive influences of gaming justify children playing for fifty hours a week, which is hardly defensible.

In summary, this session was appreciated and perceived as valuable by students, and there is a rationale for conducting it. However, the consideration of this academic knowledge within the classroom was a challenge and the studies of this thesis suggest that it can improve if further research aims to support this aspect of game education.

8.3.3 Violence

The discussion about violence marked the transition from the positive to the negative aspects of gaming. In Study 2 the transition included the video “Gaming and Productivity” (Big Think, 2012), in order to open the topic of the influences of what is represented in games with a more optimistic view. In Study 3, it was excluded in order to focus on the aspects that were considered more important, as to talk about violence, racism and sexism in one session was already challenging enough. Moreover, students seemed interested in discussing the negative aspects. Perhaps the two initial sessions discussing positive aspects of gaming prepared the ground to have an honest conversation about the negative ones.

The violence discussions were characterised by certain consensus. It is true that when Jude (Study 2) said he had broken his control after losing a game, it raised some different opinions, but in a general perspective it can be said that no voice argued against the moderate position expressed in the video “Expert-Video games don't trigger violence” (CNN, 2013).

The topic of violence was addressed differently from other topics, as it focused more on the discourse about gaming and less on what players can do about it; it was informative, but not particularly empowering to what concerns students' gaming practices. It seemed important to address this topic in the course, as it is probably the most debated influence of gaming, and the students' exaggerated opinions prior to the course, in Study 2 in particular (e.g. "games transform people into serial killers") reinforced the need to discuss it. Research about the question on whether players can do much about the violence in games, however, could suggest a different, extended, approach. At the moment, young people probably hear frequently enough that they should not be playing violent games, as was found by Chuang and Tsai (2015). On the other hand, many players seem to dismiss the simplistic association between serious violence and games (Olson, Kutner and Warner, 2008).

An alternative approach to the topic would be to encourage reflection about the violent values on which many games are based (Madill and Sanford, 2007). The recurrent narrative patterns found in games, which place violence as a central element, could be challenged by players. This strategy remains as a possibility for future research, possibly in alternative adaptations or improvements of the RGC.

8.3.4 Racism and sexism

The topics of racism and sexism in the representations of games generated the most heated debates in the classroom. The topic of sexism divided the classroom more than the topic of racism, and perhaps it occurred because the course design emphasised more sexism than racism, with the video "Damsel in Distress: Part 1 - Tropes vs Women in Video Games" (Feminist Frequency, 2013), which describes a feminist argument very explicitly. The topics of racism and sexism are very complex and involve many elements. Some other aspects that probably relate to what happened in the classroom are discussed below.

It is probably easier for most students to agree that racism and sexism are harmful and problematic in a general sense, than to agree when it comes to

concrete details. For instance, if I had proposed to analyse a study case such as the claims of racism that Resident Evil 5 (Capcom, 2009) received, perhaps the response would be similar to the ones found when we talked about sexism. Therefore, the fact that students apparently rejected more sexism-related arguments than racism ones might be related to the course design, which emphasised sexism more than racism.

There are other few contextual characteristics that probably were crucial to the resistance expressed by some players to deal with the fact that many games are not inclusive in their character design. One of the characteristics was that students were mostly active players, therefore more likely to become defensive when games are criticised as a medium. It was found by Brenick et al. (2007) when it comes to gender, and Iacovides and colleagues (2012) suggested that more involved players hold more beliefs about the benefits of gaming. The vast majority of students were also white; with a few exceptions (I am also not white). And finally, all students, the observer and I are all male. Apparently the context was conducive to the resistance to claims of sexism in the game industry. Some of the comments expressed by students revealed the urgency to discuss further in schools matters such as gender and sexualisation; perhaps if female students were present this urgency would be concealed.

The other aspect that suggests the need to further explore the topics of gender and sexualisation (and probably race, sexuality and others) is that in both cases the sessions ended with a feeling that there was much more to be said and debated, which was also the view of some of the participants when interviewed at the end of the course. With a few exceptions, it seemed to me that students were not defending passionately the sexist representations; it seemed that in general they were confused and holding problematic preconceptions, in which case longer interventions could help them clarify and reflect further upon this.

Moreover, the topics of sexism and racism could probably be presented in a more systematic approach than I made. It evolved from Study 2 to Study 3, as in the latter I prepared some material to support a specific discussion on whether stereotypical representations have influence on players. However, the topics could probably be more clearly defined, such as discussing separately

the lack of representation (e.g. there are few female protagonists), the stereotypical roles (e.g. female characters as rewards), and the stereotypical depictions (e.g. sexualisation), instead of discussing all at the same time. Similar differentiation could be made between whether the representations have these problems, and whether and how those problematic representations influence players. Also, the causes and justifications – or excuses – to perpetuate those patterns could be addressed separately. One more topic for discussion is the sexism perpetuated by players in some gaming cultures, which may repel female players. Furthermore, racism and sexism are problems that are not confined to games, and ideally they would be addressed more widely. In conclusion, the topics are complex, and to tackle them more effectively it would need more time, a more systematic approach, and to be synergic with other educational practices.

8.3.5 Excessive gaming

The topic of excessive gaming is probably the one that is addressed most frequently by parents; so apparently there is not a need to explain to students that it is a good idea in principle to be moderate in their gaming practices. Study 1 and the study of Kutner et al. (2008) suggested that reflections on whether excessive gaming is occurring are present in players' practices. Excessive gaming, then, was addressed from three perspectives: the first was to present a balanced view on the topic, which does not suggest that a whole generation is being wasted on gaming while recognising that excessive gaming is a significant problem in many cases and a serious problem sometimes. The second perspective was to discuss with students strategies to avoid playing excessively. The third perspective was to discuss with students the game devices that motivate play, which sometimes can encourage excessive play. These three perspectives will be discussed separately.

A balanced view of gaming recognises the problem while dismissing hysterical accounts of it. The video “Game addiction (part 1)” (Extra Credits, 2010) seemed to present this perspective without further difficulties.

The second perspective of encouraging students to discuss strategies to avoid excessive gaming was not much explored due to the problem with this session in Study 2. In Study 3, it was brief and apparently not very effective. New strategies would have to be developed to encourage students to talk about it. This topic can be, however, a sensitive topic to a few students (as it appeared in the interviews after the course), which presents an extra challenge to address. Perhaps more discussion in small groups or writing activities that only the teacher would read could allow students to express themselves more freely. However, because apparently this topic is already addressed in many homes, the encouragement of these reflections might not be particularly useful. Furthermore, more ideas of strategies to avoid excessive gaming could be presented to the group; in Study 3 I presented the project of a computer program that reminds the player to stop. Some participants in Study 1 revealed different strategies (e.g. uninstalling the game in exams time) that perhaps could be incorporated in this session to stimulate conversation. Although I consider this perspective the one most likely to bear fruit of the three here discussed, a focus on this could make the session be perceived as a support group trying to overcome addiction. Ideally, the approach would encourage reflection without describing games as dangerous, and without simply reinforcing feelings of guilt. After all, the emancipatory aspect of the ICEED model suggests that the gaming practices of students should not be not attacked.

The third perspective was to address excessive gaming from a more positive lens, which meant to encourage students to analyse the game devices that motivate them to play and potentially promote excessive gaming. The rationale behind this was to encourage students to be aware and understand why they play excessively. In Study 3 this part of the session became a discussion about motivating game devices, apparently making students very engaged but holding little relation to excessive gaming. This part of the session ended up holding similarities to the many perspectives of game education that emphasise a deeper understanding of games (see section 2.3.2.2). Although it seemed to raise interest of students, it would be more coherent with the current proposal

to focus on aspects that have the potential to promote change in players' practices.

In summary, from the different approaches to excessive gaming, the discussion about the discourses about the topic seemed to be easier. The other two possibilities – of addressing strategies to avoid excessive gaming and to understand the devices that promote excessive gaming – offered challenges for improvement and further research.

8.3.6 Design practices

The design practices (e.g. game creation) were addressed due to the concept of media literacy and the creative aspect it encompasses (Buckingham and Burn, 2007). However, in Study 2 this was limited to a short session in which we essentially talked about design practices and how they can be beneficial. As it seemed out of place when compared to the other sessions and students demonstrated little interest, it was removed in Study 3. It does not mean, however, that the thesis argues against using design practices in game education. It does suggest that the strategy used did not work as well as the other sessions and furthermore suggests that game education can well be done without the design practices.

However, in the literature review (section 2.3.2.6) I challenged the idea that the transposition of creation practices from other forms of media education to game education is *necessary* in the way we understand game education. On the one hand, it is important to recognise the value of game creation in its own tradition of game education, as an alternative to the ICEED. On the other hand, game creation could be addressed in future versions of the RGC. It is then natural that I discuss here how I consider that design practices could be incorporated in the RGC following the ICEED game education model.

The informative principle of the model suggests that it should focus on the influences of gaming; therefore it should be reflected how design practices can have influences that affect other aspects of players' lives besides gaming (e.g. the development of design skills (Zimmerman, 2007)). The empowering principle suggests that the educational process would address contexts in

which students have the potential to act in their game practices; in which case it would be important to use design tools (e.g. software) that are accessible to students. To follow the dialogic principle, possibly the tools could be the same ones that students are already using, or already have some familiarity with; possibly allowing for some student independence. For instance, a student who likes Age of Empires 3 (Microsoft Game Studios, 2005) could use the support from the course to create Age of Empire maps; while other students would employ different tools. In this way, students could experience design practices in the classroom in a way that they could easily incorporate into their gaming practices after the course has finished, given that those design practices are considered beneficial for students and therefore are worth encouraging and supporting.

The proposal above apparently would require many more resources (especially time and teacher expertise) if compared to the RGC researched in Studies 2 and 3 – which were only four and five hours long respectively. It would also naturally raise new challenges that were not addressed throughout this thesis, like technical difficulties or the problem that perhaps some players have no interest whatsoever in design practices. It should be noted, however, that courses such as the RGC that follow the ICEED model do not have to cover all aspects of the influences of gaming; and that considering the extra resources that including design practices (as it was described here) would require, it seems justifiable to make a compromise and leave it aside as I have done in Study 3.

8.3.7 Potential topics

Not all topics regarding the influences of gaming were covered in the RGC, hence they remain as topics that can be explored in the future. The influences of gaming described in section 2.1 and explored in Study 1 offer ideas for expansion of the RGC, for instance:

- There are many aspects of gaming that are related to socialisation. This includes both the development of social skills (e.g. leadership) through gaming and game related activities (Mac-Callum-Stewart, 2011; Jang

and Ruy, 2011), and the role of create and maintain social bonds that extrapolate the gaming contexts (Steinkuehler and Williams, 2006). This issue also involves the claims that gaming is an isolating and anti-social activity.

- Some claims refer to literacy and could be further explored in contexts where English is not the first language, as studies suggest this as an opportunity (Skoric, Teo and Neo, 2009; Cruz, Ramos and Albuquerque, 2012).
- The potential of gaming narratives to inspire positive responses could also be covered, in contrast to the problems of representation. Some examples are the claims about the development of ethical reasoning (Simkins and Steinkuehler, 2008) and pro-social behaviour (Gentile et al., 2009).

Furthermore, the topics covered in the RGC could be further expanded; for example, obesity and other physical problems could be discussed with excessive gaming, and the lack of diversity regarding sexual orientation and gender identity could be included in the problems of character representation.

8.3.8 Potential contexts

The RGC was applied within schools, but there are a variety of venues within which game education can take place, possibly using the ICEED model as a reference. One of the contexts already mentioned is the home; the matter about parenting and gaming needs further investigation and generation of ideas, as Steinkuehler (2015) argued. Clearly I am not suggesting that parents offer RGCs to their children, but the ICEED model can inform new practices of game education that are realistic for parental relationships. This was discussed in relation to tangential learning (section 8.3.1), but other topics could also be adapted to fit parental game education.

There are also different learning contexts besides school. The school curriculum is often filled with content and activities, and it might be difficult for practices such as the RGC to fit in the curriculum. Some authors argue for

this inclusion of game education (Fromme, 2012), but other venues can also be taken into account, such as libraries, clubs, scouts groups, gaming events, etc.

8.4 Limitations

The limitations of this doctoral research will be outlined in six points: (i) generalisation, (ii) researcher specificities, (iii) indicators, (iv) implementation problems, and (v) time restraints, described below.

The limitation of *generalization* is implied by the methodological choices I took. Studies, such as mine, which are small scale and qualitative, do not aim for generalisation, but for exploration of new possibilities, rich descriptions and discussion of principles and proposals. As Barab and Squire (2004, p. 10) argue, Design Based Researchers should have in mind that their “claims are based on researcher influenced contexts and, as such, may not be generalizable to other contexts of implementation”. The aim of DBR projects is not to generalise, but to develop an intervention and offer insight to the related theories. It does not mean that my findings cannot be used as inspiration for the design of new practices and models, but the specificities of the context have to be taken into account. The context was a course implemented in English schools/colleges that can be loosely described as middle class, to male teenagers, as extracurricular activities (which probably attracted some of the students most interested in gaming). Therefore to what concern the responses of students to the RGC, the findings should be considered to result from two specific investigations that do not predict the reactions of new groups of students, in accordance with the research aims.

There are also limitations that arise from *specific characteristics of mine*, which to some extent influenced the outcomes of the research. One of these characteristics is related to me as a teacher, or, more explicitly, to the fact that I am not a teacher. My previous teaching experiences were in Brazil, offering short courses in schools as part of a research project, as a lecturer’s assistant in higher education and later as a lecturer myself in a higher education context. Therefore, not only do I have a very different profile from most school teachers, but I am unfamiliar with the English educational system. This

specificity was minimised through the use of videos – which are more independent of the teacher performance than live lecturing – and the presence of a trained teacher and researcher as observer, who gave me feedback and suggestions. Moreover, the fact I am male probably offered an extra bias to the studies, in particular when gender and sexism was discussed with students. The same studies conducted by a female researcher had the potential to not only to provoke different reactions in students, but also to be more aligned to a feminist perspective that places women as protagonists of feminist movement, leading education practices about feminist topics when possible. However, as in this doctoral research, the only person I had available to implement the course was myself and since feminism was only one amongst many topics, it seems justifiable that it was led by a man. Furthermore, initiatives were made to bring some women's voices. The main video was produced and presented by a woman (Anita Sarkeesian) and the homework of the session included asking a girl/woman about their opinion. It might sound like a small detail, but it reinforces the idea that if the discussed topic is women representation, the voices of women should be heard. My other bias is related to me as a researcher, due to my background as a player and pro-games advocate. It became less evident throughout my doctoral period while I adopted a more eclectic and scholarly posture, but it was still present in my thinking to some extent. Also, it is undeniable that I always wanted my own creations (i.e. the ICEED model and the RGC) to work well and to reveal to be ideas worth researching and practising. During my research practice and report I have tried to be very honest and trustworthy, actively taking into account negative aspects and flaws as well as the positive ones. However, despite my efforts to be scholarly and trustworthy, at least to a subtle extent my expectations probably influenced how I interpreted and reported the findings.

Another limitation is related to the *indicators* I used to analyse both what occurred in the course and its outcomes. Because the study was conducted in small scale, the conclusions regarding *what occurred in the classroom* were based to a small extent on students' short responses to questionnaires, and to a larger extent on my observation of their reaction to the activities (which in Study 3 were complemented with the observations of another researcher).

These were used to suggest the extent to which students engaged in the activities, whether they had much to say about each topic, etc. Those methods were reliable enough to exploratory studies like mine, which ventured in the experimentation with new pedagogical practices using DBR as a “test-bed for innovation” (Cobb et al., 2003, p. 10), but other methods would have to be employed if the research had different aims. Moreover, the methods employed to research the *outcomes* of the course also had limitations; the advert activity proposed in Study 2 clearly failed to generate useful findings, and the pre-and-post interviews conducted in Study 3 offer limited insight about the outcomes of the course. Whether the course had an impact on students’ gaming practices *de facto* is difficult to tell, as this change would manifest in spontaneous informal conversations about games with parents or friends, or in gaming practices in their home environments and not necessarily in an easily noticeable form (e.g. awareness of the damsel in distress trope could easily go unnoticed by an external observer of one’s gaming practice). In conclusion, while recognising the value of this kind of research in the development of new pedagogical practices, the limitations related to the indicators that supported the conclusions should be taken into account.

The *execution* of the studies also had accidents and other problems. They were described in each study, and were particularly prominent in Study 2. Problems such as technical issues, the school server blocking games, students arriving late, etc., apparently had little impact on the outcomes of the course. The two most serious implementation problems were when diverse factors caused the session on excessive gaming to be severely hindered in Study 2, and when I decided to skip the tangential learning activity in Study 3, because they restricted my opportunities to investigate the classroom interactions of each of these topics. In spite of these accidents, the doctoral research managed to offer insight about each topic of the RGC and the classroom activities it proposed.

It is not to say that the course could not be further developed if there was more time to conduct extra iterations. However, research projects (and doctoral ones in particular) have *time restraints*, and the two iterations were judged to provide enough data to support the doctoral discussion, to inform the ICEED

game education model and to generate a concrete course that is able to be used by practitioners and researchers, either as a starting point or as it was described here.

In summary, there are many limitations associated with this doctoral research. I argued that they must be recognised and taken into account when the findings are analysed, otherwise the findings can be misleading. However, I do not consider that the limitations jeopardise the main contributions of the research to the field.

8.5 Concluding summary

This doctoral thesis defends the basic premise of the inclusion of the influences of gaming in a game education proposal. However, it is hoped that the contribution of this thesis to game studies can be revealed in considering its four facets.

The first contribution is the proposal of game education, the ICEED model. It proposes to understand game education by bringing the knowledge regarding the influences of gaming to game education. However, this is only the main principle, described in the informative principle of the model. The other four (i.e. critical, empowering, emancipatory and dialogical) complement the main premise by shaping a model that is coherent with my theoretical framework, resulting in a proposal that tackles important social issues (critical), encourages learners' active change (empowering), respects the playful space of gaming and players' autonomy (emancipatory) and establish constant dialogue between the educational process and learners' gaming practices (dialogical). My hope is that by discussing this proposal in scholarly manner in this thesis, it offers a reasonable, useful, well justified and promising way to understand game education. This facet of the thesis informs the theoretical understanding of game education.

The second contribution is the Reflective Gaming Course, as a designed artefact. The detailed description of the course design, the classroom interactions it generated and its outcomes offers a practical foundation to researchers and practitioners who want to employ it as a tool by implementing

it in new contexts, either in similar or different formats. Although it certainly has space for improvement, the findings suggested that the RGC as it was implemented promoted meaningful educational practices for learners with a variety of outcomes, despite the short duration of the course and its fairly simple requirements. This practical tool is the most concrete contribution of the thesis.

The third contribution of the thesis to game studies is to offer a perspective on how we, game scholars, think about the influences of gaming. During the design of the RGC, I had to understand the main academic claims regarding the influences of gaming and turn them around, looking from a player perspective. Hopefully, this concern can touch other game scholars who read or hear about my thesis, encouraging them to more often see the influences of gaming in its potential to be adapted into tools for players, for their benefit. In other words, this facet of the thesis offers some lens that scholars can use to see the influences of gaming. In this lens, the question "*how could players benefit from this study?*" becomes a constant reflection in the field.

The fourth and last main contribution of this thesis is to complement other studies about the knowledge we have about players. All studies of the thesis offer descriptions of players' perspectives about the influences of gaming, their opinions, knowledge, points of view and prior experiences. I outlined differences and similarities, recurrences and exceptions, presence and absences. I hope that the thesis allows readers to have contact with a multitude of possibilities of how players' perceive the influences of gaming, hence expanding what we know about players and inspiring more complete understandings of this aspect of players.

In conclusion, this thesis contributes to the theoretical understanding of game education, offers a practical tool to implement it, suggests a specific angle that researchers can use to look at the influences of gaming, and generates knowledge about players.

REFERENCES

- Adachi, P. J. C., & Willoughby, T. (2011). The Effect of Video Game Competition and Violence on Aggressive Behavior: Which Characteristic Has the Greatest Influence? *Psychology of Violence*, 1(4), 259-274. doi: 10.1037/a0024908
- Adachi, P. J., & Willoughby, T. (2013). More than just fun and games: the longitudinal relationships between strategic video games, self-reported problem solving skills, and academic grades. *Journal of youth and adolescence*, 42(7), 1041-1052. doi: 10.1007/s10964-013-9913-9
- Aglieri, M., & Tosone, G. (2012). Parlare per stereotipi: luoghi comuni su videogiochi e educazione. In D. Felini (Ed.), *Video game education: studi e percorsi di formazione* (pp. 23-34). Milano: Edizioni Unicopli.
- Akker, J. v. d., Gravemeijer, K., McKenney, S., & Nieveen, N. (2006). Introducing educational design research. In J. van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational Design Research* (pp. 3-7). Abingdon: Routledge Taylor & Francis Group.
- Albuquerque, R. M. d., & Cruz, D. M. (2013). Letramento Digital Através de Criação de Jogos Eletrônicos: Ensaio comparativo sobre dois contextos escolares. *Revista NUPEM*, 5(8), 123-143.
- Albuquerque, R. M. d., & Fialho, F. A. P. (2009). *Concepção de jogos eletrônicos educativos: Proposta de processo baseado em dilemas*. Paper presented at the VIII Brazilian Symposium on Games and Digital Entertainment, Rio de Janeiro (Brazil).
- Albuquerque, R. M. d., & Fialho, F. A. P. (2015). Fun and Games: Player Profiles. *The Computer Games Journal*, 4(1-2), 31-46. doi: 10.1007/s40869-015-0003-y
- Albuquerque, R. M. d., Fialho, F. A. P., Pereira, A. T. C., Gonçalves, M. M. (2009) *Digital Game Based Learning with free online games: analysing two*

games against poverty. Paper presented at the International Conference on Interactive Computer Aided Blended Learning, Florianópolis, Brazil.

Allsop, Y. (2015). A reflective study into children's cognition when making computer games. *British Journal of Educational Technology.* doi: 10.1111/bjet.12251

Anderson, C. A., & Bushman, B. J. (2001). Effects of Violent Video Games on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behavior: A Meta-Analytic Review of the Scientific Literature. *Psychological Science*, 12(5), 353-359. doi: 10.1111/1467-9280.00366

Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., Saleem, M. (2010). Violent Video Game Effects on Aggression, Empathy, and Prosocial Behavior in Eastern and Western Countries: A Meta-Analytic Review. *Psychological Bulletin*, 136(2), 151-173. doi: 10.1037/a0018251.supp

Anderson, T., & Shattuck, J. (2012). Design-Based Research: A Decade of Progress in Education Research? *Educational Researcher*, 41(1), 16-25. doi: 10.3102/0013189x11428813

Apperley, T., & Beavis, C. (2014). A model for critical games literacy. *The Journal of Digital Learning and Teaching Victoria*, 1(1), 46-54.

Apperley, T., & Walsh, C. (2012). What digital games and literacy have in common: a heuristic for understanding pupils' gaming literacy. *Literacy*, 46(3), 115-122.

AsapScience. (2014). Can Video Games Make You Smarter? , from <https://www.youtube.com/watch?v=OOsqkQytHOs>

Barab, S., & Squire, K. (2004). Design-Based Research: Putting a Stake in the Ground. *Journal of the Learning Sciences*, 13(1), 1-14. doi: 10.1207/s15327809jls1301_1

Bavelier, D. (2012). Your brain on video games (publisher: TED), from <https://www.youtube.com/watch?v=FktsFcooIG8>

Bavelier, D., Green, C. S., Pouget, A., & Schrater, P. (2012). Brain plasticity through the life span: learning to learn and action video games. *Annual review of neuroscience*, 35, 391-416.

BBCLearning. (2010). Caught in the Web- Addicted to gaming, from <https://www.youtube.com/watch?v=7o00lcnJBik>

Birmingham, S., Charlier, N., Dagnino, F., Duggan, J., Earp, J., Kiili, K., . . . Whitton, N. (2013). *Approaches to Collaborative Game-Making for Fostering 21st Century Skills*. Paper presented at the European Conference on Games Based Learning, Porto (Portugal).

Biesta, G. J. J., & Burbules, N. C. (2003). *Pragmatism and educational research*. Lanham (US): Rowman & Littlefield Publishers.

Blumberg, F. C., & Altschuler, E. (2011). From the Playroom to the Classroom: Children's Views of Video Game Play and Academic Learning. *Child Development Perspectives*, 5(2), 99-103.

Brenick, A., Henning, A., Killen, M., O'Connor, A., & Collins, M. (2007). Social Evaluations of Stereotypic Images in Video Games: Unfair, Legitimate, or "Just Entertainment"? *Youth & Society*, 38(4), 395-419. doi: 10.1177/0044118X06295988

Brooks, F. M., Chester, K. L., Smeeton, N. C., & Spencer, N. H. (2015). Video gaming in adolescence: factors associated with leisure time use. *Journal of Youth Studies*, 1-19. doi: 10.1080/13676261.2015.1048200

Brown, A. L. (1992). Design Experiments: Theoretical and Methodological Challenges in Creating Complex Interventions in Classroom Settings. *Journal of the Learning Sciences*, 2(2), 141-178.

Buckingham, D. (2003). *Media Education: literacy, learning and contemporary culture*. Cambridge: Polity Press.

Buckingham, D. (2007). *Beyond technology: Children's learning in the age of digital culture*. Cambridge: Polity Press.

Buckingham, D., & Burn, A. (2007). Game Literacy in Theory and Practice. *Journal of Educational Multimedia and Hypermedia*, 16(3), 323-349.

Buckingham, D., & Scanlon, M. (2003). *Education, Entertainment and Learning in the Home*. Buckingham: Open University Press.

Burgess, M. C. R., Dill, K. E., Stremer, S. P., Burgess, S. R., & Brown, B. P. (2011). Playing With Prejudice: The Prevalence and Consequences of Racial Stereotypes in Video Games. *Media Psychology*, 14(1), 289-311. doi: 10.1080/15213269.2011.596467

Burn, A., & Durran, J. (2007). *Media Literacy in Schools: Practice, Production and Progression*. London: Paul Chapman Publishing.

Carr, D. (2006). Games and gender. In D. Carr, D. Buckingham, A. Burn & G. Schott (Eds.), *Computer Games: text, narrative and play* (pp. 162-178). Cambridge: Polity Press.

Chuang, T.-Y., & Tsai, C.-M. (2015). Forecast the Scarcity of Game Generation: Digital Game Literacy. In T.-B. Lin, V. Chen & C. S. Chai (Eds.), *New Media and Learning in the 21st Century: A Socio-Cultural Perspective* (pp. 109-128). Singapore: Springer Singapore.

CNN. (2013). Expert: Video games don't trigger violence, from <https://www.youtube.com/watch?v=nvhovITygBI>

Cobb, P., Confrey, J., diSessa, A., Lehrer, R., & Schauble, L. (2003). Design Experiments in Educational Research. *Educational Researcher*, 32(1), 9-13. doi: 10.3102/0013189x032001009

Collins, A. (1992). Toward a design science of education *New directions in educational technology*: Springer Berlin Heidelberg.

Collins, A., Joseph, D., & Bielaczyc, K. (2004). Design Research: Theoretical and Methodological Issues. *Journal of the Learning Sciences*, 13(1), 15-42. doi: 10.1207/s15327809jls1301_2

Cruz, D. M., & Albuquerque, R. M. d. (2014). A produção de jogos eletrônicos por crianças: narrativas digitais e o RPG Maker. *Comunicação & Educação*, 19(1), 111-120.

Cruz, D. M., Albuquerque, R. M. d., & Azevedo, V. d. A. (2010). LinCity-NG como ferramenta pedagógica: utilização de um jogo de simulação em sala de aula. *Plurais*, 1(2), 226-238.

Cruz, D. M., Nóvoa, R., Albuquerque, R. M. d. (2012) Games na escola: criação de jogos eletrônicos como estratégia de letramento digital. *Entrever*, 2 (3), 137-150.

Cruz, D. M., Ramos, D. K., & Albuquerque, R. M. d. (2012). Jogos eletrônicos e aprendizagem: o que as crianças e os jovens têm a dizer? (Electronic Games and Learning: what do children and young people say on the subject?). *Contrapontos*, 12(1), 87-96.

Dede, C. (2004). If Design-Based Research is the Answer, What is the Question? A Commentary on Collins, Joseph, and Bielaczyc; diSessa and Cobb; and Fishman, Marx, Blumenthal, Krajcik, and Soloway in the JLS Special Issue on Design-Based Research. *Journal of the Learning Sciences*, 13(1), 105-114. doi: 10.1207/s15327809jls1301_5

Dewey, J. (1902/2011). *The Child And The Curriculum*. Mansfield Centre: Martino Publishing.

Dewey, J. (1938/1997). *Experience & Education*. New York: Touchstone.

Dietz, T. L. (1998). An Examination of Violence and Gender Role Portrayals in Video Games: Implications for Gender Socialization and Aggressive Behavior. *Sex Roles*, 38(516), 425-442.

Dill, K. E., Brown, B. P., & Collins, M. A. (2008). Effects of exposure to sex-stereotyped video game characters on tolerance of sexual harassment. *Journal of Experimental Social Psychology*, 44, 1402-1408. doi: 10.1016/j.jesp.2008.06.002

Dill, K. E., & Thill, K. P. (2007). Video Game Characters and the Socialization of Gender Roles: Young People's Perceptions Mirror Sexist Media Depictions. *Sex Roles*, 57(11-12), 851-864. doi: 10.1007/s11199-007-9278-1

Durkin, K., & Barber, B. (2002). Not so doomed: computer game play and positive adolescent development. *Applied Developmental Psychology*, 23, 373-392.

Dye, M. W., Green, C. S., & Bavelier, D. (2009a). Increasing Speed of Processing With Action Video Games. *Current Directions in Psychological Science*, 18(6), 321-326. doi: 10.1111/j.1467-8721.2009.01660.x

Dye, M. W., Green, C. S., & Bavelier, D. (2009b). The development of attention skills in action video game players. [Research Support, Non-U.S. Gov't]. *Neuropsychologia*, 47(8-9), 1780-1789. doi: 10.1016/j.neuropsychologia.2009.02.002

Edutopia. (2013). Learning STEM Skills by Designing Video Games from <https://www.youtube.com/watch?v=qkAietIUKVU>

Everett, A., & Watkins, S. C. (2008). The Power of Play: The Portrayal and Performance of Race in Video Games. In K. Salen (Ed.), *The Ecology of Games: Connecting Youth, Games, and Learning* (pp. 141-164). Cambridge: The MIT Press.

Ewoldsen, D. R., Eno, C. A., Okdie, B. M., Velez, J. A., Guadagno, R. E., & DeCoster, J. (2012). Effect of playing violent video games cooperatively or competitively on subsequent cooperative behavior. [Randomized Controlled Trial]. *Cyberpsychology, Behavior and Social Networking*, 15(5), 277-280. doi: 10.1089/cyber.2011.0308

ExtraCredits. (2012). Game Addiction (part 1), from
<https://www.youtube.com/watch?v=Y5RSngCFpsc>

Facer, K., & Furlong, R. (2001). Beyond the Myth of the 'Cyberkid': Young People at the Margins of the Information Revolution. *Journal of Youth Studies*, 4(4), 451-469. doi: 10.1080/13676260120101905

Fantin, M. (2010). Frontiers and Rhetoric of the Videogame in Schools. *Research on Educational Media*, 2(1), 43-62.

Felini, D. (2012a). Ragionare di videogiochi e educazione. In D. Felini (Ed.), *Video game education: studi e percorsi di formazione* (pp. 9-20). Milano: Edizioni Unicopli.

Felini, D. (2012b). Analizzare videogiochi nel lavoro didattico. In D. Felini (Ed.), *Video game education: studi e percorsi di formazione* (pp. 77-90). Milano: Edizioni Unicopli.

Felini, D. (2013). *What to Teach about Video Games, and How? An Action-Research Project with Undergraduate University Students*. Paper presented at the Learning & Teaching with Media & Technology, Genoa.

Ferguson, C. J. (2010a). Blazing Angels or Resident Evil? Can Violent Video Games Be a Force for Good? *Review of General Psychology*, 14(2), 68-81. doi: 10.1037/a0018941

Ferguson, C. J. (2010b). Video games and youth violence: a prospective analysis in adolescents. *Journal of youth and adolescence*, 40(4), 377-391. doi: 10.1007/s10964-010-9610-x

Ferguson, C. J. (2015). Does Media Violence Predict Societal Violence? It Depends on What You Look at and When. *Journal of Communication*, 65(1), E1-E22. doi: 10.1111/jcom.12129

Freire, P. (1970/2005). *Pedagogy of the opressed* (M. B. Ramos, Trans. 30th Anniversary Edition ed.). New York: Continuum.

Freire, P., & Guimarães, S. (2011). *Educar com a mídia: Novos diálogos sobre educação*. São Paulo: Paz e Terra.

Fromme, J. (2012). Digital Games and Media Education in the Classroom: Exploring concepts, Practices, Constraints. In J. Fromme & A. Unger (Eds.), *Computer Games and New Media Cultures: a handbook of digital games studies* (pp. 647-664). New York: Springer.

Gauntlett, D. (1998). Ten things wrong with the "effects" model. In R. Dickinson, R. Harindranath & O. Linné (Eds.), *Approaches to audiences: a reader* (pp. 120-130). London: Arnold.

Gee, J. P. (2007). *What video games have to teach us about learning and literacy* (Revised and Updated Edition ed.). New York: Palgrave MacMillan.

Gentile, D. (2009). Pathological Video-Game Use Among Youth Ages 8 to 18. *Psychological Science*, 20(5), 594.

Gentile, D. A., Anderson, C. A., Yukawa, S., Ihori, N., Saleem, M., Ming, L. K., Shibuya, A., Liau, A. K., Khoo, A., Bushman, B. J., Huesmann, L. R., Sakamoto, A. (2009). The effects of prosocial video games on prosocial behaviors: international evidence from correlational, longitudinal, and experimental studies. *Personality & social psychology bulletin*, 35(6), 752-763. doi: 10.1177/0146167209333045

Gillen, J. (2009). Literacy practices in Schome Park: a virtual literacy ethnography. *Journal of Research in Reading*, 32(1), 57-74. doi: 10.1111/j.1467-9817.2008.01381.x

Gose, E., & Menchaca, M. (2014). *Video Game Genres and What is Learned From Them*. Paper presented at the E-Learn, New Orleans (US).

Granic, I., Lobel, A., & Engels, R. C. M. E. (2013). The Benefits of Playing Video Games. *American Psychologist*, 69(1), 66-78.

Green, C. S., & Bavelier, D. (2007). Action-Video-Game Experience Alters the Spatial Resolution of Vision. *Psychological Science*, 18(1), 88-94.

Green, C. S., Pouget, A., & Bavelier, D. (2010). Improved probabilistic inference as a general learning mechanism with action video games. *Current biology*: CB, 20(17), 1573-1579. doi: 10.1016/j.cub.2010.07.040

Greenfield, P. M. (2009). Technology and Informal Education: What Is Taught, What Is Learned. *Science* 323, 69-71.

Grüsser, S. M., Thalemann, R., & Griffiths, M. D. (2007). Excessive computer game playing: evidence for addiction and aggression? *Cyberpsychology & behavior : the impact of the Internet, multimedia and virtual reality on behavior and society*, 10(2), 290-292. doi: 10.1089/cpb.2006.9956

Gutiérrez, A., & Tyner, K. (2012). Educación para los medios, alfabetización mediática y competencia digital. *Comunicar: Revista Científica de Educomunicación*, 38(19), 31-39. doi: 10.3916/C38-2011-02-03

Hamlen, K. R. (2011). Children's choices and strategies in video games. *Computers in Human Behavior*, 27(1), 532-539. doi: 10.1016/j.chb.2010.10.001

hooks, b. (1994). Teaching to transgress: Education as the Practice of Freedom. New York: Routledge.

Hsu, J. (2009). Video Games Lack Female and Minority Characters, from <http://www.livescience.com/9696-video-games-lack-female-minority-characters.html>

Huizinga, J. (1949). *Homo ludens : a study of the play-element in culture*. London Routledge & Kegan Paul.

Iacovides, I., Aczel, J., Scanlon, E., & Woods, W. (2012). Investigating the relationships between informal learning and player involvement in digital games. *Learning, Media and Technology*, 37(3), 321-327. doi: 10.1080/17439884.2012.641568

Iacovides, I., McAndrew, P., Scanlon, E., & Aczel, J. (2014). The Gaming Involvement and Informal Learning Framework. *Simulation & gaming*, 45(4-5), 611-626. doi: 10.1177/1046878114554191

Jackson, L. A., Witt, E. A., Games, A. I., Fitzgerald, H. E., Eye, A. v., & Zhao, Y. (2012). Information technology use and creativity: Findings from the Children and Technology Project. *Computers in Human Behavior*, 28, 370-376. doi: 10.1016/j.chb.2011.10.006

Jang, Y., & Ryu, S. (2011). Exploring game experiences and game leadership in massively multiplayer online role-playing games. *British Journal of Educational Technology*, 42(4), 616-623. doi: 10.1111/j.1467-8535.2010.01064.x

Johnson, S. (2005). *Everything Bad is Good for You: How Today's Popular Culture Is Actually Making Us Smarter*. New York: Riverhead Books.

Jones, G. (2003). *Killing Monsters: Our Children's Need for Fantasy, Heroism and Make-believe Violence*. New York: Basic Books.

Kafai, Y., & Peppler, K. (2012). Developing game fluencies with Scratch: realizing game design as an artistic process. In C. Steinkuehler, K. Squire & S. Barab (Eds.), *Games, Learning and Society: learning and meaning in the digital age* (pp. 355-380). Cambridge: Cambridge University Press.

Kallio, K. P., Mayra, F., & Kaipainen, K. (2010). At Least Nine Ways to Play: Approaching Gamer Mentalities. *Games and Culture*, 6(4), 327-353. doi: 10.1177/1555412010391089

Kamphorst, B. A. (2011). *Reducing Procrastination by Scaffolding the Formation of Implementation Intentions*. Master of Science (MSc), Utrecht University, Utrecht.

Kellner, D., & Share, J. (2005). Toward Critical Media Literacy: Core concepts, debates, organizations, and policy. *Discourse: studies in the cultural politics of education*, 26(3), 369-386. doi: 10.1080/01596300500200169

Kelly, A. (2006). Quality criteria for design research: evidence and commitments. In J. van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational Design Research* (pp. 107-118). Abingdon: Routledge Taylor & Francis Group.

Kent, N., & Facer, K. (2004). Different worlds? A comparison of young people's home and school ICT use. *Journal of Computer Assisted Learning*, 20(1), 440-455.

Kincheloe, J. L. (2008). *Critical Pedagogy Primer* (Second Edition ed.). New York: Peter Lang.

King, G. (2004). Using Templates in the Thematic Analysis of Text. In C. S. Cassell, Gillian (Ed.), *Essential Guide to Qualitative Methods in Organizational Research* (pp. 256-270): SAGE Publications.

Klimmt, C. (2009). Key Dimensions of Contemporary Video Game Literacy: Towards A Normative Model of the Competent Digital Gamer. *Eludamos. Journal for Computer Game Culture*, 3(1), 23-31.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs: Prentice Hall.

Kuhn, S., Gleich, T., Lorenz, R. C., Lindenberger, U., & Gallinat, J. (2014). Playing Super Mario induces structural brain plasticity: gray matter changes resulting from training with a commercial video game. *Molecular psychiatry*, 19(2), 265-271. doi: 10.1038/mp.2013.120

Kutner, L. A., Olson, C. K., Warner, D. E., & Hertzog, S. M. (2008). Parents' and Sons' Perspectives on Video Game Play: A Qualitative Study. *Journal of Adolescent Research* 23(1), 76-96. doi: 10.1177/0743558407310721

Ladson-Billings, G. (1995). Toward a Theory of Culturally Relevant Pedagogy. *American Educational Research Journal*, 32(3), 465-491.

Lankshear, C., & Knobel, M. (2006). *New Literacies: Everyday Practices & Classroom Learning*. Maidenhead: Open University Press.

Lenhart, A., Kahne, J., Middaugh, E., Macgill, A. R., Evans, C., & Vitak, J. (2008). Teens, Video Games, and Civics (pp. 76). Washington: Pew Internet & American Life Project.

MacCallum-Stewart, E. (2011). Stealth Learning in Online Games. In S. d. Freitas & P. Maharg (Eds.), *Digital Games and Learning* (pp. 107-128). London: Continuum.

Madill, L., & Sanford, K. (2007). Understanding the power of new literacies through video game play and design. *Canadian Journal of Education*, 30(2).

Malliet, S. (2006). An exploration of adolescents' perceptions of videogame realism. *Learning, Media and Technology*, 31(4), 377-394.

Marsh, J. (2011). Young Children's Literacy Practices in a Virtual World: Establishing an Online Interaction Order. *Reading Research Quarterly*, 46(2), 101-118. doi: 10.1598/rrq.46.2.1

McGonigal, J. (2011). *Reality is Broken: Why Games Make Us Better and How They Can Change the World*. New York: The Penguin Press.

McGonigal, J. (2012). Gaming and Productivity (publisher: BigThink), from <https://www.youtube.com/watch?v=mkdzy9bWW3E>

McKenney, S., Nieveen, N., & van den Akker, J. (2006). Design Research from a curriculum perspective. In J. van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational Design Research* (pp. 67-90). Abingdon: Routledge Taylor & Francis Group.

Moumoutzis, N., Christoulakis, M., Pitsiladis, A., Sifakis, G., Maragkoudakis, G., & Christodoulakis, S. (2014). *The ALICE experience: A learning framework to promote gaming literacy for educators and its refinement*. Paper presented at the International Conference on Interactive Mobile Communication Technologies and Learning (IMCL), Thessaloniki, Greece.

Newman, J., & Oram, B. (2006). *Teaching Videogames*. London: British Film Institute.

Olson, C. K., Kutner, L. A., & Warner, D. E. (2008). The Role of Violent Video Game Content in Adolescent Development: Boys' Perspectives. *Journal of Adolescent Research*, 23(1), 55-75.

Owston, R., Wideman, H., Ronda, N. S., & Brown, C. (2009). Computer game development as a literacy activity. *Computers & Education*, 53, 977-989. doi: 10.1016/j.compedu.2009.05.015

Pargman, D., & Jakobsson, P. (2008). Do you believe in magic? Computer games in everyday life. *European Journal of Cultural Studies*, 11(2), 225-244. doi: 10.1177/1367549407088335

Partington, A. (2010). Game literacy, gaming cultures and media education. *English Teaching: Practice and Critique*, 9(1), 73-86.

Peppler, K., Warschauer, M., & Diazgranados, A. (2010). Game Critics: Exploring the Role of Critique in Game Design Literacies. *E-Learning*, 7(1), 35-48.

Portnow, J., & Floyd, D. (2008). Video Games and Learning, from <http://www.youtube.com/watch?v=rN0qRKjfX3s>

Potter, W. J. (2004). *Theory of Media Literacy: A Cognitive Approach*. Thousands Oaks (US): Sage Publications.

Quandt, T., & Kowert, R. (2015). No black and white in video game land! Why we need to move beyond simple explanations in the video game debate. In R. Kowert & T. Quandt (Eds.), *The video game debate: unravelling the physical, social, and psychological effects of digital games* (pp. 176-189). New York: Routledge.

Ritter, D., & Eslea, M. (2005). Hot Sauce, Toy Guns, and Graffiti: A Critical Account of Current Laboratory Aggression Paradigms. *Aggressive Behavior*, 31(1), 407-419. doi: 10.1002/ab.20066

Robson, C. (2011). *Real World Research: A resource for Users of Social Research Methods in Applied Settings* (Third ed.). Chichester: Wiley.

Rodríguez-Hoyos, C., & Albuquerque, R. M. d. (2015). Racist representations in digital games: an investigation of players' discourses. In L. Mitchell (Ed.), *Computer Games, Children and the Internet: Technology, Educational Uses and Effects on Cognitive Development* (pp. 23-41). New York: Nova Science.

Salen, K. (2012). How Portal 2 developers became the best 6th grade physics teachers ever, 2015, from <http://www.fastcompany.com/3002872/how-portal-2-developers-became-best-6th-grade-physics-teachers-ever>

Salomon, G., & Perkins, D. (2005). Do technologies make us smarter? Intellectual amplification with, of, and through technology. In R. J. Sternberg & D. D. Preiss (Eds.), *Intelligence and Technology: The Impact of Tools on the Nature and Development of Human Abilities* (pp. 71-86). Mahwah: Lawrence Erlbaum Associates.

Sanford, K., & Madill, L. (2007). Critical Literacy Learning through Video Games: adolescent boys' perspectives. *E-Learning*, 4(3), 285. doi: 10.2304/elea.2007.4.3.285

Sarkeesian, A. (2012). Bayonetta And Advertising (published by Feminist Frequency). (video removed)

Sarkeesian, A. (2013). Damsel in Distress: Part 1 - Tropes vs Women in Video Games (publisher: Feminist Frequency), from https://www.youtube.com/watch?v=X6p5AZp7r_Q

Scharrer, E., & Leone, R. (2008). First-Person Shooters and the Third-Person Effect. *Human Communication Research*, 34(2), 210-233. doi: 10.1111/j.1468-2958.2008.00319.x

Science.tv. (2008). Are games good for you, from <https://www.youtube.com/watch?v=iMUzBtTqOy8>

Sefton-Green, J. (2004). *Literature Review in Informal Learning with Technology Outside School* Futurelab Series (pp. 43). Bristol: Futurelab.

Shaffer, D. W., Squire, K. R., Halverson, R., & Gee, J. P. (2005). Video games and the Future of Learning. *PHI DELTA KAPPAN*, 87(2), 105-111.

Shaffer, D. W. (2006). Epistemic frames for epistemic games. *Computers & Education*, 46(1), 223-234. doi: 10.1016/j.compedu.2005.11.003

Simkins, D. W., & Steinkuehler, C. (2008). Critical Ethical Reasoning and Role-Play. *Games and Culture*, 3(3-4), 333-355. doi: 10.1177/1555412008317313

Skoric, M. M., Teo, L. L. C., & Neo, R. L. (2009). Children and Video Games: Addiction, Engagement, and Scholastic Achievement. *Cyberpsychology & behavior*, 12(5), 567-572.

Spence, I., & Feng, J. (2010). Video games and spatial cognition. *Review of General Psychology*, 14(2), 92-104. doi: 10.1037/a0019491

Squire, K. (2006) From Content to Context: Videogames as Designed Experience, *Educational Researcher*, 35(8), 19-29.

Squire, K. (2008). Video-game Literacy: A Literacy of Expertise. In J. Coiro, M. Knobel, C. Lankshear & D. J. Leu (Eds.), *Handbook of Research on New Literacies* (pp. 635-669). New York: Lawrence Erlbaum Associates Taylor & Francis Group.

Squire, K. (2011). *Video Games and Learning: Teaching and Participatory Culture in the Digital Age*. New York: Teachers College Press.

Steinkuehler, C. (2007). Massively Multiplayer Online Gaming as a Constellation of Literacy Practices. *E-Learning*, 4(3), 297. doi: 10.2304/elea.2007.4.3.297

Steinkuehler, C. (2015). Parenting and Video Games. *Journal of Adolescent & Adult Literacy*, n/a-n/a. doi: 10.1002/jaal.455

Steinkuehler, C., & Duncan, S. (2008). Scientific Habits of Mind in Virtual Worlds. *Journal of Science Education and Technology*, 17(1), 530-543. doi: 10.1007/s10956-008-9120-8

Steinkuehler, C. A., & Williams, D. (2006). Where Everybody Knows Your (Screen) Name: Online Games as “Third Places”. *Journal of Computer-Mediated Communication*, 11(1), 885-909. doi: 10.1111/j.1083-6101.2006.00300.x

Stevens, R., Satwicz, T., & McCarthy, L. (2008). In-Game, In-Room, In-World: Reconnecting Video Game Play to the Rest of Kid's Lives. In K. Salen (Ed.), *The Ecology of Games: Connecting Youth, Games, and Learning* (pp. 41-66). Cambridge: The MIT Press.

Tassi, P. (2014). Why 'Clicker Heroes' Could Be The Top Mobile Game Of 2015, from <http://www.forbes.com/sites/insertcoin/2014/10/14/why-clicker-heroes-could-be-the-top-mobile-game-of-2015/>

Thorne, S. L., Black, R. W., & Sykes, J. M. (2009). Second language use, socialization, and learning in Internet interest communities and online gaming. *The Modern Language Journal*, 93(Focus), 802-820.

Tobin, J. (1998). An American Otaku (or, a boy's virtual life on the net). In J. Sefton-Green (Ed.), *Digital diversions: youth culture in the age of multimedia* (pp. 106-127). London: UCL Press.

Tracy, S. J. (2013). *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact*. Chichester (UK): Wiley-Blackwell.

Turkay, S., & Adinolf, S. (2012). What do Players (Think They) Learn in Games? *Procedia - Social and Behavioral Sciences*, 46, 3345-3349. doi: 10.1016/j.sbspro.2012.06.064

Unsworth, G., & Ward, T. (2001). Video Games and Aggressive Behaviour. *Australian Psychologist*, 36(3), 184-192.

Unsworth, G., Devilly, G. J., & Ward, T. (2007). The effect of playing violent video games on adolescents: Should parents be quaking in their boots? *Psychology, Crime & Law*, 13(4), 383-394. doi: 10.1080/10683160601060655

Velez, J. A., Greitemeyer, T., Whitaker, J. L., Ewoldsen, D. R., & Bushman, B. J. (2014). Violent Video Games and Reciprocity: The Attenuating Effects of Cooperative Game Play on Subsequent Aggression. *Communication Research*. doi: 10.1177/0093650214552519

Vintetjärn, B. (2008). *Video Games – a Source of Knowledge? An investigation amongst youths about their thoughts on their video gaming habits*. Master, Malmö University, Malmö.

Weis, R., & Cerankosky, B. C. (2010). Effects of video-game ownership on young boys' academic and behavioral functioning: a randomized, controlled study. *Psychological Science*, 21(4), 463-470. doi: 10.1177/0956797610362670

Whitton, N. (2014). *Digital games and learning: research and theory*. New York: Routledge.

Williams, D., Martins, N., Consalvo, M., & Ivory, J. D. (2009). The virtual census: representations of gender, race and age in video games. *New Media & Society*, 11(5), 815-834. doi: 10.1177/1461444809105354

Williamson, B., & Facer, K. (2004). More than 'just a game': the implications for schools of children's computer games communities. *Education, Communication & Information*, 4(2-3), 255-270. doi: 10.1080/14636310412331304708

Wood, R. T. A. (2007). Problems with the Concept of Video Game "Addiction": Some Case Study Examples. *International Journal of Mental Health and Addiction*, 6(2), 169-178. doi: 10.1007/s11469-007-9118-0

Zagal, J. P. (2010). *Ludoliteracy: Defining, Understanding and Supporting Games Education*. ETC Press.

Zimmerman, E. (2007). Gaming literacy Game Design as a Model for Literacy in the 21st century. *Harvard Interactive Media Review*, 1(1), 30-35.

Zwieten, M. v. (2012). *Video Games Literacy: a Theoretical Framework*. M.A. in New Media and Digital Culture, Utrecht University, Utrecht.

GAME REFERENCES

2K Games [publisher] (2007). *Bioshock*.

2K Games [publisher] (2010). *Civilization 5*.

Activision [publisher] (2003). *Call of Duty*.

Arcade Town [publisher] (2006). *3rd World Farmer*.

Atari [publisher] (2006). *Neverwinter Nights 2*.

Atari [publisher] (2007). *The Witcher*.

Atlus [publisher] (2011). *Rock of Ages*.

Bethesda Softworks [publisher] (2011). *The Elder Scrolls V: Skyrim*.

Blizzard [publisher] (1996). *Diablo*.

Blizzard Entertainment [publisher] (2004). *World of Warcraft*.

Cipher Prime [publisher] (2008). *Auditorium*.

Cirulli [publisher] (2014). *2048 Game*.

Eidos Interactive [publisher] (1996). *Tomb Raider*.

Electronic Arts [publisher] (1993). *Fifa*.

Interplay Entertainment [publisher] (1997). *Fall Out*.

Kongregate [publisher] (2011). *CycloManiacs 2*.

LucasArts [publisher] (2009). *Tales of Monkey Island*.

Micropose [publisher] (1991). *Sid Meier's Civilization*.

Micropose [publisher] (1996). *Sid Meier's Civilization II*.

Microsoft Game Studios [publisher] (2007). *Mass Effect*.

Microsoft Studios [publisher] (1997). *Age of Empires*.

Mikengreg [publisher] (2010). *Solipskier*.

Mojang [publisher] (2011). *Minecraft*.

Nintendo [publisher] (1996). *Super Mario 64*.

Nintendo [publisher] (2002). *Star Fox Adventures*.

Playsaurus [publisher] (2014). *Clicker Heroes*.

Rockstar Games [publisher] (1997). *Grand Theft Auto*.

Rockstar Games [publisher] (2013). *Grand Theft Auto V*.

Schine [publisher] (2012). *Starmade*.

Sega [publisher] (2010). *Bayonetta*.

Sierra Entertainment [publisher] (2003). *The Hobbit*.

Sierra Studios [publisher] (1999). *Half Life*.

Subset Games [publisher] (2012). *FTL: Faster Than Light*.

Ubisoft [publisher] (2007). *Assassin's Creed*.

Valve Corporation [publisher] (2011). *Portal 2*.

Virgin Interactive [publisher] (1996). *Command & Conquer: Red Alert*.

We Create Stuff [publisher] (2007). *Portal: the Flash Game*.

APPENDICES

Appendix 1: Interview questions (Study 1)

In this interview participants received the questions printed and were asked to read the questions and write down their answers in the five points scale (question 5 onwards). The interviewer asked extra questions in most items in order to expand the answers, and participants were expected to respond orally to those.

BASIC INFORMATION

Gender: () Female () Male () Other

Year in which you were born: _____

Course you are studying:_____

Nationality:_____

SECTION - A - General Game Experience

1) Please write the name of up to your 6 most preferred games, starting with the one you liked the most (please include the version and the platform):

I -_____

II -_____

III -_____

IV -_____

V -_____

VI -_____

2) Number of hours you spend playing digital games every week currently:_____

3) Number of hours you used to spend playing digital games every week at the time you used to play the most: _____

4) "My preferred games help me relax"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

5) "My preferred games make me stimulated"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

6) "My preferred games require complex problem solving"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

7) "My preferred games are repetitive"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

8) "I think about the benefits I will gain when I choose a game to play"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

9) Do you usually talk with someone about the games you play?

() Never () Rarely () Occasionally () Frequently () Very frequently

10) How frequently, when you were younger, did you talk about games with an adult?

() Never () Rarely () Occasionally () Frequently () Very frequently

11) How frequently do you access online communities concerning games?

() Never () Rarely () Occasionally () Frequently () Very frequently

12) How frequently do you use scenario editors of games?

() Never () Rarely () Occasionally () Frequently () Very frequently

13) How frequently do you use modding games?

() Never () Rarely () Occasionally () Frequently () Very frequently

SECTION - B - Games and School

14) Did you participate in any use of digital games at your school?

() Never () Rarely () Occasionally () Frequently () Very frequently

15) “There were lots of relationships between digital games and my school experiences”

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

16) “Some of the games I used to play taught me something that school also taught me”

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

17) How frequently during your school education did something you experienced in school remind you about a game you had previously played?

() Never () Rarely () Occasionally () Frequently () Very frequently

18) How frequently during your school education did something you experienced in a game remind you about a school topic you had previously learnt?

() Never () Rarely () Occasionally () Frequently () Very frequently

If any of these connections between school and games happened, what is your opinion about the following statements? (please comment after each question)

(if it happened more than once, think about what usually happened) (if it never happened, go to the SECTION C)

19) “The connection made me more motivated to play the game”

(Completely disagree (Partially disagree (Neutral (Partially agree (Completely agree

20) “The connection helped me to learn the school content”

(Completely disagree (Partially disagree (Neutral (Partially agree (Completely agree

21) “My experiences with the game changed after I made the connection”

(Completely disagree (Partially disagree (Neutral (Partially agree (Completely agree

SECTION - C - Beyond the game

22) “Playing computer games is bad for me”

(Completely disagree (Partially disagree (Neutral (Partially agree (Completely agree

23) “My game habit hindered my studies”

(Completely disagree (Partially disagree (Neutral (Partially agree (Completely agree

24) Have you seen something in a game that later you figured out was inaccurate?

(Never (Rarely (Occasionally (Frequently (Very frequently

25) “The games I have played changed my beliefs and attitude”

(Completely disagree (Partially disagree (Neutral (Partially agree (Completely agree

26) "Playing games is good for me"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

27) "I develop skills playing games that are useful out of the game context"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

28) "I learnt about facts or content while playing games that are useful out of the game context"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

29) "I usually reflect about the games I play"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

30) Did any game made you so motivated about a topic that you looked for more information from other sources?

() Never () Rarely () Occasionally () Frequently () Very frequently

31) "In the future games will be an important educational tool in schools"

() Completely disagree () Partially disagree () Neutral () Partially agree () Completely agree

Appendix 2: Interview questions (students)(Study 2)

Interview implemented individually after the Reflective Gaming Course.

- 1) Did you have the chance to talk about any of the topics before the course?
- 2) What were the positive points of the course? Your favourite sessions and topics?

- 3) What are the negative points of the course? Your less favourite lessons and topics?
- 4) Did you think about reflective gaming during the other days of the week? Why?
- 5) Do you think your approach to play games changed in any way?
- 6) What was the most valuable thing that you learnt?
- 7) Do you have any other comment or suggestion?

Appendix 3: Interview questions (teacher)(Study 2)

Interview implemented after the Reflective Gaming Course, with teacher who supported the course.

- 1) How do you think it went?
- 2) What could I do to improve it?
- 3) Could it fit into the curriculum?

Appendix 4: Online survey questions (Study 2)

The questions below were individually answered online from the classroom, at the end of each session of the Reflective Gaming Course.

Session 1

- 1) Have you searched for topics in a game before this session? If yes, which games and which topics?
- 2) Did you find out something new about a game topic in this lesson? If yes, which games and which topics?
- 3) Which other ideas for future search about the topics of your games do you have? (please write the game and the topic)
- 4) Do you have any comments about this session?

Session 2

- 1) Do you think you developed any abilities by playing games before this session? (such as strategic planning and motor skills) If yes, which games and which skills? If no, why not?
- 2) Do you think you will develop any new abilities by playing computer games that you like? If yes, which games and which abilities/skills? If no, why not?
- 3) Do you have any comments about this session?

Session 3

- 1) Do you think there is a degree of racism in game industry? Please comment.
- 2) Do you think there is a degree of sexism in game industry? Please comment.
- 3) If you think there is violence, racism or sexism in the game industry, what can players do about it? (if you think there is not, just write it)
- 4) Do you have any comments about this session?

Session 4

- 1) Do you think the time you spend playing games prevent you from doing other important things? Please comment.
- 2) Do you think it would be better to you to play games for less time? If yes, what could you do to help you to play less?
- 3) Do you have any comments about this session?

Appendix 5: Interview questions (Study 3)

Part 1

The questions below were asked after participants played (individually) each of the two games, before the Reflective Gaming Course. After the course had finished, the process was repeated.

- 1) Do you play games such as this one?
- 2) What do you think are the good things about this game?
- 3) What do you think are the bad things about this game?
- 4) What do you think about the main characters?
- 5) What do you think about the experiences the game provides for you?
- 6) Imagine a parent was unsure about buying this game for a 12 years old child. What would tell them about this game to help them make a decision?
- 7) Imagine a parent was worried their 12 years old child was spending too much time playing computer games. Could you give them any advice about playing this game?

Part 2

The questions below were asked individually at the very end of the second interviews (after the course).

- 1) Thinking back on the course as a whole, what did you learn about games and learning?
- 2) Again considering the course as a whole, do you think it has made you think differently about games and gaming?
- 3) Do you think courses like this should be offered in schools and colleges in the future?
- 4) How do you think this course could be better?
- 5) How old are you?
- 6) How many hours do you estimate you normally play digital games during school terms?
- 7) How many hours do you estimate you normally play digital games between school terms?

8) What are your favourite game genres?

9) What are your favourite games?

Appendix 6: Survey questions (Study 3)

The questions below were given in a printed questionnaire individually at the end of each session of the Reflective Gaming Course.

Name:

1) “I learnt something about games and gaming during this session”

() Strongly agree () Agree () Neither agree nor disagree () Disagree ()
Strongly disagree

Please explain your response:

2) “This session has made me think differently about games and gaming”

() Strongly agree () Agree () Neither agree nor disagree () Disagree ()
Strongly disagree

Please explain your response:

3) Do you have any suggestions about how I could improve this session in the future?