Video Games And Learning

A theoretical approach to the use of commercial-off-the-shelf video games in Norwegian upper secondary education

VEGARD OLEPI YLVISAKER HUTHMACHER

SUPERVISOR
Erik Mustad

University of Agder, 2020/21
Faculty of Humanities and Education
Department of Foreign Languages and Translation

Abstract

This thesis explores the educational potential of commercial video games. With LK20, games and gaming have become integral part of Norwegian education, especially with a specific aim in the new English subject curriculum (ENG01-04) and with the broad definition of texts as cultural expressions. Due to the uncertainties surrounding the covid-19 pandemic, no original action-research was conducted. Therefore, this thesis offers a purely theoretical approach instead. It offers a literary analysis and discussion of a wide selection of theories and research regarding games and learning, followed by a theoretical exploration of how one commercial video game, namely *Detroit: Become Human* (2018) can be effectively utilized in learning contexts in Norwegian upper secondary education. Thus, the following two research questions are answered: (1) What does existing theories and research suggest one can learn from games and gaming in general, what are their potential learning effects? and (2) In light of existing theories and research, what can potentially be learnt by using *Detroit: Become Human* (*DBH*) in educational contexts, and how could various learning outcomes be achieved through its use? More specifically, the thesis explores the educational potential of video games to facilitate motivating, interactive, multimodal, and safe learning environments that enable exploration of identities through immersion and identification to foster deep learning and critical thinking.

Acknowledgements

Before all else, I want to thank my supervisor Erik Mustad, who twice reassured me: First, that a purely theoretical thesis is a valid alternative in these uncertain times when conducting original action-research seemed too high a risk. Secondly, that the thesis supervision would not suffer from my move to Trondheim in December 2020. You proved right on both accounts. Your expertise and invaluable feedback and insights truly helped me write a better thesis.

I would also like to thank Associate Professor David Ciccoricco at the University of Otago who first inspired my interest in the topic through the course in Digital Literature during my semester abroad in 2019, and gladly helped me along on my search for relevant and sound literature for my thesis.

Furthermore, I would like to thank my ever-supportive parents. Mom, you have always encouraged my creativity and been a valuable interlocutor in discussions regarding education and teaching. Dad, you have always lent second eyes to my writing, always read, corrected, and given valuable commentaries on my writing, which has shaped me into the writer I am today. For that I am very grateful.

Lastly, I must thank my girlfriend Victhoria, for her constant encouragements and help which has motivated my writing process when it was sorely needed. You are my rock and my haven.

Vegard O. Y. Huthmacher
Trondheim, May 2020

Table of Contents

1. Introduction

1.1. Thesis Background

The question is no longer whether pupils can learn from using games in education or not. Rather, other questions arise in its wake. What can be learned from gaming? Which games are appropriate and effective to utilize for educational purposes? How can chosen games maximize learning among pupils? This thesis builds on theories and empirical research conducted on the use of games to facilitate and promote learning in educational contexts. It explores how different aspects of games can be used in educational settings for various learning benefits. Based on a selected overview of applicable theories and research conducted in relevant fields of study, this thesis further aims to exemplify through *Detroit: Become Human* (2018; *DBH)* how commercial video games can be utilized in various ways for different learning outcomes.

With 'games/gaming' specifically mentioned in the new upper secondary English subject curriculum (ENG01-04) in Læreplanverket for Kunnskapsløftet 2020 (LK20) as a form of cultural expression, games become increasingly integral to the Norwegian school curricula. Hence, this thesis aims to contribute to the growing field regarding the use of digital games for educational purposes by examining and discussing the educational properties of video games in general, and *Detroit: Become Human* specifically. This thesis will focus on how immersion through fictional video games can contribute to deep learning, supported by games' ability to create safe learning environments for learners where failure is unthreatening and enables exploration of identity, as well as the role of motivation, multimodality, and interactivity and feedback.

Despite its futuristic and fantastical premise, *DBH* has great educational potential, which is partly what this thesis explores. Unfortunately, the game is only a few years old and limited research has been conducted on the game itself, let alone its' applicability to learning. This pose both a challenge and a relief, since it makes finding good sources on the main literature difficult, but simultaneously leaves the field of research wide open to explore. The learning effects of both educational and commercial digital games have increasingly been studied over the last decades. Therefore, the theoretical framework will offer a wide scope of the literary fields regarding games and learning, which will then be linked and applied to *DBH*.

1.2. Some Clarifications and Restrictions due to the Pandemic

With this thesis' didactic theme, action-research conducted in a Norwegian upper secondary English classroom would have been beneficial. However, planning to execute action-research in a classroom became increasingly difficult and simply too uncertain due to the covid-19 pandemic. Despite reaching out to some contacts at upper secondary schools in Kristiansand who were positive to the idea of action-research regarding the use of games in education, ultimately, the situation was too unstable and uncertain to make this thesis dependent on such research. The idea of conducting action-research was thus scratched, and instead, in dialogue with supervisor, the thesis became purely theoretical. Therefore, rather than collecting and analysing original empirical data, this thesis presents a selection of theories and research on the relationship between games and learning, and discuss their relevance and validity, thus giving a literary analysis of the academic field in question.

1.3. Aims and Research Questions

Despite the disputed nature of the research field of games and learning, games evidently have the potential to offer a vast scope of untapped learning capacity. The question is not whether one can learn from games, but rather what and how one can learn from the various games that exist, and which types of games are appropriate to use in educational contexts.

The current thesis aims to examine and explore how various aspects of games, especially commercial entertainment games, can be used in educational settings to help facilitate learning and enhance learning outcomes. More specifically, the thesis will explore the educational potential of video games to foster critical thinking and deep learning through their immersive properties, ability to create multimodal, playful and safe learning environments, exploration of identity, motivation, and interactivity and feedback. Thus, the following aims are addressed to explore video games' educational potential:

- What does existing theories and research suggest one can learn from games and gaming in general, what are their potential learning effects?
- In light of existing theories and research, what can potentially be learnt by using *Detroit: Become Human* (*DBH*) in educational contexts, and how could various learning outcomes be achieved through its use?

1.4. Thesis Outline

With its theoretical approach, the focus of this thesis will be education and learning in light of existing theories and research. Chapter two presents how video games relate to Norwegian education and examines some overarching problems regarding games and learning in general as well as potential problems regarding *DBH*. Then it briefly describes the differences in terminology pertaining to educational and commercial games, and how their potential for learning might differ. Chapter three dives deeper into the appropriate fields of study by presenting, discussing, and analysing a selection of applicable theories and existing research concerning the field of games and learning. The chapter grasps wide with a holistic approach, touching on theories and research regarding the role of immersion, play, motivation, multimodality, interactivity and feedback, games as learning environments, and games as potential fosterer of critical thinking and higher-level deep learning. Chapter four uses the findings from chapters two and three to consider and discuss various ways in which the game *Detroit: Become Human* can be beneficially utilized in Norwegian upper secondary education to facilitate learning. This entails a short presentation of the game itself and a discussion of possible selection criteria for using commercial games like *DBH* for learning. Chapter five presents a conclusion, connecting the various elements of the thesis and answers the research questions. At the end, suggestions for further research are given.

2. Games, Curricula and Challenges

Challenges arise when implementing games in educational contexts. The following chapter accounts for some of the challenges and brings a few clarifications by narrowing the scope of this thesis. First, video games' newfound position in the Norwegian upper secondary school is explored. Thereafter follows a clarification of the differences between educational and commercial games, and what their respective strengths and weaknesses are. Lastly, this chapter considers challenges the field of games and learning faces, both generally and regarding *Detroit: Become Human* particularly.

2.1. Games and the Norwegian Curricula

Following is an extensive rendition of LK20's "core curriculum – values and principles for primary and secondary education", and brief renditions of other relevant curricula for this thesis (ENG01-04; ENG04-02). What is highlighted in this section is relevant to keep in mind while progressing through the thesis, as later discussions refer to various aspects outlined here. Despite the thorough investigation of the curricula, the angle remains specified on games in general, and *DBH* more specifically, which influences the selection of the following highlighted aspects.

2.1.1. Core Curriculum

The Norwegian core curriculum applies to all teaching at lower and secondary levels, and "describes the fundamental approach that shall direct the pedagogical practice" (Utdanningsdirektoratet, n.d.). It elaborates on the core values and objectives from the Education Act, which states that the purpose of education in Norway is to open doors to the world by granting pupils historical and cultural anchorage, as well as provide insight into cultural diversity, and promote equality and democratic values. It is explicitly expressed that pupils shall have opportunities to be creative, committed, and inquisitive in order to learn critical thinking, environmental awareness and how to act ethically (Utdanningsdirektoratet, n.d.).

The core values form the foundation of all school activities and must be used actively to promote the development of appropriate attitudes in pupils of all ages. These values concern human dignity, identity and cultural diversity, critical thinking and ethical awareness, engagement, the urge to explore, environmental awareness, and democracy and participation. Identity and cultural diversity shall "help […] pupil[s …] preserve and develop [their] identity

in an inclusive and diverse environment" by giving them historical and cultural insight, as well as a common reference framework (Utdanningsdirektoratet, n.d.). Encounters with different cultural expressions "support the development of each person's identity, make pupils confident in who they are" and "present common values […] needed to participate in this diverse society and to open doors to the world and future" (Utdanningsdirektoratet, n.d.). Critical thinking and ethical awareness are developed by asking questions and being inquisitive as it promotes the ability "to understand that [one's] own experiences, point of view and convictions may be incomplete or erroneous" (Utdanningsdirektoratet, n.d.). For in-depth learning, schools must nurture various ways to explore and experiment, since pupils "learn and develop through sensory perceptions and thinking, aesthetic forms of expressions and practical activities" (Utdanningsdirektoratet, n.d.). Therefore, exposition to various cultural expressions is important to further personal development. To develop environmental awareness, knowledge about and understanding of "how our lifestyles impact nature and climate," (Utdanningsdirektoratet, n.d.) and consequentially our societies, is fundamental. Education should promote the fundamental democratic values of respect, tolerance and individual freedom, which "can counteract prejudices and discrimination", encourage peaceful conflict solutions and ensure the protection of minorities (Utdanningsdirektoratet, n.d.).

The principles for education and all-round development, called *bildung*, "are interlinked and mutually dependent", and encompass several aspects (Utdanningsdirektoratet, n.d.). Education is a part of life-long bildung and should grant pupils with "a wealth of experiences" through varied activities "from structured and goal-oriented work to spontaneous play", which promote "independence, responsibility and compassion" (Utdanningsdirektoratet, n.d.). Interactions are elementary to bildung, as they form the basis for empathy and promote growth of identity, self-image, opinions, and attitudes. Therefore, education should encompass social learning with discussions that stimulate confidence and encourage pupils to both express personal opinions and discuss issues on behalf of others. Additionally, all subjects have a shared responsibility to promote learning regarding three interdisciplinary topics; health and life skills; democracy and citizenship; and sustainable development. Identity and positive self-image are highlighted in health and life skills, as is learning how to deal with both successes and failures. Democracy and citizenship focus on the basic tenets, values and rules of democracy, and the relationship between democracy and human rights. It emphasizes that neither democracy nor human rights can be taken for

granted, but must be maintained and developed. Sustainable development asserts the need to provide for contemporary people without ruining the possibilities for future generations, and that all individual activities and choices are significant and have impact. This interdisciplinary topic covers "issues relating to the environment and climate, poverty and distribution of resources, conflicts, health, [and] equality" (Utdanningsdirektoratet, n.d.).

The principles for the schools' practice thus build on supportive learning environments, as uncertainty and anxiety undermine learning and diminish learning outcomes. Pupils differ greatly in terms of prior knowledge and past experiences, as well as in attitude and aptitude. Regardless, schools should facilitate learning for all pupils and offer them equal learning and development opportunities through varying learning activities that provide pupils with a sense of mastery and motivate independency. Trial and error should be deemed a source of learning, and therefore failure should be welcomed and accepted.

2.1.2. Curriculum in English

The Norwegian curriculum in English (ENG01-04) covers the curriculum for English learning from primary school to year one in upper secondary (VG1). This is the curriculum for the fundamental English subject in the Norwegian school system which all pupils encounter and finish. The curriculum states the importance of English as a school subject due to its ability to facilitate the development of pupils into confident adults in an increasingly globalized world, opening "new perspectives on the world and ourselves" (Utdanningsdirektoratet, 2020a). The new programme curriculum (ENG04-02) covers elective subjects at VG2 and VG3. All these curricula cover language and language learning, literature, communication, engaging with authentic situations, history and culture (Utdanningsdirektoratet, 2020a; Utdanningsdirektoratet, 2021/2022).

The English subjects enable understanding, identity development, global and local communication, and foster different ways of thinking and living. Additionally, they prepare pupils to become confident users of English, regarding both written and oral language. Communication is defined as creating meaning through language in various contexts in interactions with authentic situations, language learning, and working with English language texts. Texts are defined in a broad sense and include spoken, written, printed, digital, graphic, artistic, formal, informal, fictional, factual, contemporary, and historical cultural expressions of meaning that can contain writing, pictures, audio, numbers, graphs, drawings and "other forms of expression that are combined to enhance and present a message" (Utdanningsdirektoratet, 2020a; Utdanningsdirektoratet 2021/2022). Engagement with

various texts constitutes the foundation for identity-building as pupils learn to reflect on, interpret and critically assess them. This also "help[s …] prevent prejudices", which is especially relevant regarding the interdisciplinary topic of democracy and citizenship (Utdanningsdirektoratet, 2020a).

The competence aims especially relevant for this thesis concern exploration of "diversity and social conditions in the English-speaking world based on historical contexts", as well as discussing and reflecting on the "form, content and language features […] in different cultural forms of expression from different media […] including […] gaming" (Utdanningsdirektoratet, 2020a). It is worth mentioning that the Norwegian version of the curriculum specifies 'games' (Utdanningsdirektoratet, 2020b) rather than 'gaming'.

2.2. Educational and Commercial Games

Whitton (2014), among others, is a passionate advocate for the use of games in education and a firm believer in the educational potential of video games. Egenfeldt-Nielsen (2006) states that "[t]here is little doubt that we can learn from video games", the questions that remain however, relate to "who, what, where, why and how quickly" (p. 186). He further specifies that many researchers thus far have neglected to examine whether the results from using video games for specific learning goals differ from alternative activities, with many research studies lacking control groups. Using games for educational purposes rather than pure enjoyment might impact the potential learning outcomes, and it is also important to differentiate between what one can learn 'accidentally' by simply playing a game, and what one can learn with targeted effort to achieve specific learning outcomes (Egenfeldt-Nielsen, 2006, p. 186). Therefore, this thesis explores the differences of games produced for a specific educational purpose, called educational games, and entertainment games, often referred to as commercial-off-the-shelf (COTS) games, which are created mainly for enjoyment purposes.

Educational games include both research-based video games and so-called 'edutainment' games as both types are developed with the intent to be used for learning. Research-based games are specifically created and designed for research studies with aims to test specific learning outcomes. They are usually strongly documented, and the learning closely aligns with intended learning outcomes. Furthermore, they often present new approaches by providing active, meaningful collaborative learning experiences, and are typically associated with constructivism. 'Edutainment' games, as the amalgam suggests, are

games that try to combine education with entertainment and are also called commercial educational games. They are created to look like mainstream video games, but designed to teach basic skills such as memorization, arithmetic, and spelling, due to them typically being modelled on the principles of behaviorism. These games usually employ simple drill-and-practice learning, simple game-play, and rely on extrinsic motivation. Such games mostly lack meaningful interactions and fail to create equally engaging game-play as mainstream games. Learning in such games happens primarily in terms of factual acquisition, which is a narrow and flawed definition of learning (Egenfeldt-Nielsen, 2006, p. 186-188; Whitton, 2014, p. 4-5, 13-16, 19-22, 26).

In contrast, commercial entertainment games are games created and designed for the commercial market, intended to give players pleasurable gaming experiences, focusing on keeping them engaged rather than to educate. They usually have a greater scope, are more complex and take longer to finish than educational games. Their motivational and playability aspects are evident in their commercial success, but there is usually little evidence of their learning benefits in the context of formal education. Such games have however been used in the classroom for educational purposes with partial success (i.e. Squire and Barab, 2004; Robertson and Howell, 2008). Nevertheless, the educational goals of such games are indirect, in stark contrast to educational games. Additionally, commercial games tend to be more expensive, require powerful hardware and are "difficult to integrate with institutional systems" (Whitton, 2014, p. 26). Furthermore, most overlap between the goals of a game and the learning aims are coincidental. Therefore, COTS in education are mostly used as discussion stimulus or incentives, rather than integrated learning tools. Nevertheless, one cannot dismiss that deep and active learning can occur when implementing COTS in formal education. To maximize the potential learning outcomes from COTS, learners require additional associated activities facilitated by teachers to help learners engage with the learning "in a meaningful, collaborative and reflective way" (Whitton, 2014, p. 26). In other words, teachers must explicitly re-purpose entertainment games for the educational context (Egenfeldt-Nielsen, 2006, p. 186-188; Whitton, 2014, p. 4-5, 13-16, 26).

Conclusively, educational games tend to focus on very specific basic skills and "fail to facilitate meaningful, engaging, and deep learning experiences" (Egenfeldt-Nielsen, 2006, p. 2006). Commercial games, however, are harder to integrate into formal educational contexts, but offer a vaster and more powerful potential for deeper learning, albeit such learning

requires more from teachers in terms of facilitating and directing the learning to match with intended learning outcomes.

2.3. The Problems with Games and Learning

Despite examples of effective use of games to create meaningful learning experiences, the field of games and learning lacks robust scientific evidence regarding games' educational value as effective learning tools. Whitton (2014) points out there is evidence supporting the positive educational effect of games in various subject areas across various age groups, and overall, Egenfeldt-Nielsen (2006) notes that the "current findings on learning outcomes are positive and promising" (p. 188). Simultaneously, both warrant skepticism due to several problematic aspects connected to the existing research, such as widespread lack of control groups, researcher bias, weak assessment tests and short exposure time. Consequently, the theoretical and research base needed to establish guidelines for practice does not exist (Egenfeldt-Nielsen, 2006, p. 188; Van Eck, 2007, p. 31; Whitton, 2014, p. 12-22).

2.3.1. Problems Regarding the Existing Research

According to Whitton (2014), at the heart of every discussion regarding games and learning, is the question whether there is "any evidence that digital games have an impact on learning" or motivation to learn (p. 12). Egenfeldt-Nielsen (2006) points out a fundamental issue concerning the research on games' effectiveness for learning in his overview of the existing research on the educational use of video games. There is no doubt that one can learn from games and "[l]earning from video games spans a wide area of topics" (p. 186), but the question remains if one can learn more from games than alternative activities. He points out that many researchers within the field of video games' educational effect neglect to compare the results gained from the use of video games with alternative activities. However, Whitton (2014) highlights the ethical considerations this presents, as all pupils should be ensured a comparable and acceptable learning experience and outcome. In short, the quality of one's education should not be at the expense of someone's research. Nevertheless, the widespread lack of control groups results in uncertainties concerning whether educational use of video games can be an equal, yet alone better, teaching method than other options (Egenfeldt-Nielsen, 2006, p. 184-186, 190; Whitton, 2014, p. 12-22).

Furthermore, researchers who test the effectiveness of video games are often biased and have vested interest in its success, and to meaningfully measure any type of learning,

especially over time, is difficult (Egenfeldt-Nielsen, 2006, p. 184-205; Whitton, 2014, p. 12-22). Meaningful assessment of game-based learning is not always possible, especially when games are either small-scale or only used marginally. Assessment constitutes an evaluation of whether learning has taken place or not by considering to which degree pupils can evidence learning outcomes through some form of test. However, a lot of learning from games, Whitton (2014) argues, is not explicitly assessed. Formal assessment does not account for transferability of knowledge since assessment usually occurs immediately after the course, nor unintended learning "such as problem-solving, teamwork or negotiation" (Whitton, 2014, p. 14). Thus, traditional assessment may be an inappropriate or insufficient method of assessing what pupils can gain from game-based learning (Whitton, 2014, p. 12-22).

Different types of games have generated different research results. Much research concludes that simple behaviorist educational video games are effective for simple basic skills such as memorization of facts, reading, writing, and spelling, but the limited scope of learning results in minimal higher learning such as deep understanding and reflection. Therefore, the transfer of knowledge from game to other contexts is weak. Cognitivist educational games focus more on integrating the gaming experience with the learning experience by incorporating elements of discovery, and thus shift motivation from extrinsic to intrinsic. The focus shifts from content to facilitate problem-solving skills. Once again, transferability proves difficult as the problem-solving skills generated are often connected to video game settings (Egenfeldt-Nielsen, 2006, p. 190-201). The games usually used in education and research, educational titles, are typically small-scale. Regarding such smaller scale games that are only used for a few hours, Whitton (2014) argues that any possible effect will be minimal and short-lasting, and the learning effect will probably be insignificant on overall learning (p. 12-22). In contrast, the socio-cultural approach to teaching with video games focuses more on the social interactions that occur around the game because of exploration, reflection, and discussion, than the actual game itself. This approach uses commercial video games, since existing educational games "fail to facilitate meaningful, engaging, and deep learning experiences" (Egenfeldt-Nielsen, 2006, p. 200), and see games as tools to construct learning experiences rather than being the learning experience per se. The social practices forced by this approach constantly call for critical thinking, and findings concerning peer learning and the social interaction mediated through the game experience are interesting. Squire (2004) concludes in his PhD dissertation that good games engage in several ways and create dynamic learning opportunities (Egenfeldt-Nielsen, 2006, p. 190-201). It is important to note that the

game itself is not the source for learning here, but rather the environment that is developed around the game experience. The question then remains whether something other than the game could generate equally potent learning environments.

In contrast to smaller scale educational games which' simple learning objectives are relatively easy to test with pre- and post-tests, there is an argument for games' real potential to be "their ability to help learners engage with the higher level learning outcomes, such as […] creativity, teamwork, evaluation and critical thinking", which are all learning outcomes that are not easily tested (Whitton, 2014, p. 15). Much deep learning is not quantifiable and measurable, such as critical thinking and motivation. Additionally, researchers face difficulties persuading students to give up more time for additional testing, and timing tests must be carefully designed to take account for both short-time and long-time learning, as well as transferability. Self-evaluation might offer some help in certain areas that are difficult to measure, but self-evaluation "is notoriously inaccurate" (Whitton, 2014, p. 15). Thus, robust evidence can only be achieved through mixed-method approaches that span over longer periods of time, which is difficult to achieve (Whitton, 2014, p. 13-16). Furthermore, much of the existing research lacks sound theoretical grounding. In their analysis of game-based learning, Wu et al. (2012), found that most studies conducted on the field of game-based learning were not based on theories of learning (Whitton, 2014, p. 13).

There are numerable meta-analyses that attempt to gather evidence for the effectiveness of game-based learning. Whitton (2014) summarizes key findings from ten of the most prominent meta-analyses since 2005. Most empirical studies focused on lower-level learning such as knowledge acquisition or content understanding, and flawed methodology was a common theme. Use of control groups is inconsistent, research terms are ill-defined and information in studies is lacking in general. Research on the effectiveness of video games is inconclusive since the evidence is limited and inconsistent, though some evidence suggests that games can be beneficial. Informal play of entertainment titles leads to improved attention and visual perceptual skills, and games can improve factual knowledge, and positively impact "problem-solving skills, broader knowledge acquisition, motivation and engagement" (Whitton, 2014, p. 20). There is, however, limited evidence that games improve cognitive skills. Instructional support features such as briefings and feedback are consistently proven essential for game-based learning, and "games can trigger enthusiasm and support students' on-task concentration" (Whitton, 2014, p. 20). Whitton (2014), in line with Egenfeldt-Nielsen's (2006) findings, thus concludes that games' effectiveness varies "due to limitations

of the research methods employed and variations in the contexts and types of game used, which makes it difficult to draw general conclusions" (p. 21).

However, the field of games and learning is not unique regarding the experienced issues, as there are always difficulties evaluating learning in any way. Games undoubtedly offer a potential positive impact on both engagement and learning, but game-based learning does not ensure this due to the numerable factors at play. Like Egenfeldt-Nielsen (2006), Whitton (2014) finds the most interesting question regarding games and learning "how [games] can be made most effective […] and accepted; so that digital games [can] make a difference to the practice of teaching and learning" (p. 21) rather than *whether* one can learn from games (p. 20-22).

2.3.2. Practical Issues and Implications

In addition to the limited and inadequate research, other practical barriers exist relating to the educational context. Aspects of the educational setting itself can constrain the use of games, such as short lessons, how the physical space and surroundings impact the pupils, the and the differing game competence among the students. As might the cost of the game, as well as more temporal problems relating to the installation-time of the actual game, and teacher preparation work. Furthermore, how the use of video games is perceived in the educational setting also influences the learning experience. If teacher or pupils are skeptical to the value of using video games in educational settings, the potential learning outcome diminishes (Egenfeldt-Nielsen, 2006, p. 188-190).

Egenfeldt-Nielsen (2006) outlines five areas of tension regarding the use of video games in educational contexts, four of which are relevant to elaborate on here. Firstly, he addresses the tension between learning vs. playing. The major challenge occurs when the goals of the game design do not align with the learning goals, since pupils then will focus on achieving the game's goals. Using commercial games elevates this particular risk. Therefore, the aim must be to find game designs where learning and playing do not work against each other. The second tension regards freedom vs. control. There is great emphasis on students' gained freedom and control with use of games, especially with more complex and open-ended games. Problems arise, however, because players feel their control should not be interfered with from the outside, yet students "criticize the lack of direct educational interventions" (Egenfeldt-Nielsen, 2006, p. 203). Players do not want to give up control over how to play, but pupils need to see how the playing is relevant for their learning as the lack of a firm setting makes the expectations unclear, and this creates tension. Explicitly framing the game

experience as education by stressing the goals from an educational perspective and clarifying that the pupils will not have full freedom and control whilst playing like they expect when playing in their spare time prove beneficial – as does careful guidance, scaffolding, relevant introductions, and debriefings connected to the game experience. Another tension is transmission vs. construction. Video games' immersive effect can lead to a lack of awareness of the contents and structures of the game, and thus result in weaker overall learning and transfer. Introducing an artefact that is both meaningfully integrated into the gameplay and simultaneously works as a tool to help cross from game to classroom setting, such as a notebook, are shown to have positive effect on knowledge transfer. Thus, actively pursuing links with other teaching forms and explicitly focus on transfer, rather than solely rely on the game, is important to provide fuller learning experiences. Lastly, the possibly most crucial tension concerns the role of the teacher. Consistent findings in research highlight the importance of teachers as facilitators of learning with video games, yet many teachers fail to truly take charge when teaching with video games. Many researchers therefore state that games themselves are not inherently educational, but that they provide interested teachers with opportunities, as the teacher's role is imperative for the learning experience. This is particularly true when using commercial titles (Egenfeldt-Nielsen, 2006, p. 202-206; Whitton, 2014, p. 19-22). Naturally, relying too much on individual teachers give rise to several new problems, such as teachers' motivation, available time, knowledge about the game and willingness to engage with it.

Conclusively, video games certainly facilitate learning, but the existing evidence is too weak for saying anything more. Few current studies compare video games with other styles of teaching, nor account for various learning outcomes over time that can be difficult to measure, such as motivation and other subjective experiences. Furthermore, few studies include explicit debriefing, which is central to the educational use of games (Egenfeldt-Nielsen, 2006, p. 190; Whitton, 2014, p. 12-22). Thus, using games in educational settings just for the sake of using games, just like using any other activity just for the sake of it, is insufficient. Effective use of games must be appropriately incorporated and accompanied by a motivated and engaged teacher that can scaffold the learning experiences surrounding the game.

2.3.3. Challenges with Games and Teaching in the 21st century

Another problematic aspect in Norwegian upper secondary English, is the relation between in-school and out-of-school English activity. Teachers and the educational system struggle to keep up with the rapidly advancing technological development of the last decades,

resulting in a gap between pupils' in- and out-of-school activities, by Henry (2013) dubbed an "authenticity gap". Too big of a gap results in discouraged and demotivated pupils, and a possible solution is to expose pupils to more types of English they encounter outside of school, labelled "authentic English" (Aaberg, 2020, p. 1-2; Sundqvist & Olin-Scheller, 2013, p. 329). Despite young learners being increasingly exposed to English in their pastime activities through tools such as the internet, many teachers struggle to build on pupils' out-of-school English activities to bridge the gap between in- and out-of-school English practices (Aaberg, 2020, p. 1-2; Olsson, 2012). This constitutes a problem because pupils expect in-school English to be applicable and relevant for their out-of-school activities (Aaberg, 2020, p. 1-2; Henry, Sundqvist, & Thorsen, 2019, p. 28). According to The Norwegian Professional Digital Competence Framework, "teachers must develop their own professional digital competence" to manage bridging the gap (Kelentric, Helland, & Arstorp, 2017, p. 1). This, however, is challenging as teachers must not only keep up with the technological development, but also manage to keep up with young learners' out-of-school activities by familiarizing themselves with pupils' popular culture and use of media. One way to bridge the gap might be the incorporation of games into education, since games constitute one such popular culture media and are "teaching [our kids] to succeed in the Twenty-first Century" (Prensky, 2006, p. iii). Teachers should be encouraged to actively use pupils' out-of-school activities in a positive and meaningful way in the classroom, irrelevant what those activities are. Gaming is simply one of many such activities.

2.3.4. Problems Regarding *Detroit: Become Human*

Like any game, the commercial game *DBH* encounters issues when applied to educational contexts. Teachers must put in efforts to facilitate the game's learning potential and adapt the approach to the educational context (see 4.3). Further issues relate to the type of console the game is available on, the price, the game's age restriction, as well as the age of the game itself.

Originally, *DBH* was a PlayStation Exclusive title, making it available solely on PlayStation consoles. This would hinder its use in education, as PlayStations are not common in Norwegian schools. However, *DBH* has since been released for computers too, rendering its use in Norwegian upper secondary school plausible. It is standard in Norwegian upper secondary schools for pupils to have access to either a laptop or a tablet for school-work purposes. Each student having a personal laptop technically enables using the game's computer version.

Schools have limited budgets for equipment, including acceptable games for the use in education. On computer devices, *DBH* is, at the time of writing (16.02.21), available for purchase through Steam for 279,- NOK (Steam, n.d.). Using only one game for each second or third pupil in the class necessitates 10-15 game-licenses for one class set, resulting in at least 2790,- NOK. Such a price is likely manageable for most upper secondary schools if the game can be used by several classes over multiple years.

Pan European Game Information (PEGI) 18 and Entertainment Software Rating Board (ESRB) Mature 17+ age-classifications, may be an issue when intended for educational use. In Norway, age restrictive classifications on video games are only recommendations, not required by law (Medietilsynet, n.d.; Rasmussen, 2017). Thus, *DBH*'s use in education for pupils under 18 years is legal. However, schools might suffer parental/guardian backlash if they do. After ten years of obligatory education, pupils in Norway are usually either 16 or turning 16 when they start upper secondary education. Therefore, they all turn 18 during VG3, some as late as December. This leaves a narrow timeframe for implementing *DBH* in educational contexts with students over 18. Alternatively, for pupils under 18, schools can seek consent from parents and legal guardians to use the game for educational purposes. This, however, is not ensured, and most schools will probably be reluctant to spend thousands on a game with PEGI 18 classification.

Lastly, *DBH* is less than three years old, which in a research context may be considered new, but to pupils a three-year-old game might already be outdated. Pupils who are drawn to games like *DBH* have probably played the game several years ago, while those who did not get around to it back when it was released, might not have any intention of playing it, due to the constant stream of new video games being released. There will always be newer games to play. This needs not be an issue, but it may decrease the motivational value of using a video game in education.

3. Theoretical Framework and Literary Analysis

There are always several factors that influence the efficiency of any educational setting, context, and environment, and thus impact the learning. This chapter presents, discusses and analyses selected theories and research concerning how the use of games might influence a broad selection of such factors, and thus contribute to or hinder learning.

3.1. General Aspects Concerning Learning Situations

First, however, some general aspects that affect all learning situations need to be addressed. This section elaborates on the role of the teacher and the learning environment, followed by a short presentation and discussion of learning styles theory.

3.1.1. Role of the Teacher and the Learning Environment

As Egenfeldt-Nielsen (2006) and Whitton (2014) point out, the teacher's role is a determining factor of learning efficiency in any educational context. It is therefore important to keep in mind that the active role of a motivated, safe, and capable teacher is a consistent prerequisite for most learning, including the successful implementation of games. Conditions where pupils do not feel safe, or the teacher is unprepared and uninterested, negatively affect any learning environment. This is reflected in Krashen's (1982) affective filter hypothesis for second language acquisition. The theory states that several affective variables impact the relative success of second language acquisition, most of which can be placed within the following three categories: *motivation, self-confidence,* and *anxiety*. With higher motivation, pupils usually acquire second languages better, and the same applies for pupils with good self-image and self-confidence. Experiencing high anxiety levels in the learning environment negatively impacts the learning (Krashen, 1982, 30-32).

3.1.2. Learning Preferences

Learning styles theory suggests that different learners have different preferred learning styles. Learning preferences, attitudes, cognitive styles, and approaches to studying are but a few of the wide variety of ways learning styles have been considered (Whitton, 2014, p. 168-169). The identification of learning styles remains elusive, "in spite of long empirical efforts" (Sancho, Moreno-Ger, Fuentes-Fernandez & Fernandez-Manjon , 2009, p. 114), which has generated much debate regarding the validity of learning styles. Descriptions of "learning styles as flexible strategies to tackle learning" rather than an unshakeable and immovable biologically or socially constructed preference, has gathered positive feedback (Sancho et al.,

2009, p. 114). Rather than classifying learning styles, such ideas of learning styles categorize students into types of learners based on which "strategies they usually employ to approach learning" (Sancho et al., 2009, p. 114).

One learning styles theory is the theory of visual-auditory-kinaesthetic (VAK) learning styles, which claims people prefer a distinct sensory learning input, be it visual, auditory, or kinaesthetic. This idea of sensory learning preferences is widespread in educational institutions (Whitton, 2014, p. 169), but the theory is problematic due to its lack of a strong evidential base. Despite the weaknesses of the theory, other learning models, such as Garner's (1993) multiple intelligences theory, support the idea of individual learning preferences, and "the general idea that different individuals prefer to receive information from different sensory inputs, process them and learn from them in different ways is not implausible" (Whitton, 2014, p. 169). Regardless of whether the learning styles theory holds true or not, different individuals do prefer different approaches to learning and thus prefer different methods of teaching (Sankey, Birch, & Gardiner, 2011, p. 18-20), which is why variation is fundamental in education.

3.2. Motivations

Motivation is key to all learning contexts and is a main argument for using video games in education. Researchers disagree on games' educational value and potential, but most agree that games are motivational (Squire, 2005, p. 2). This section focuses on the motivational properties of games and whether these are transferable into the classroom along with the game without diminishing the learning.

Here, motivation builds on Ryan and Deci's (2000) article where they present and consider the classic definitions and traditional classification of motivation as either intrinsic or extrinsic. According to them, motivation is "to be moved to do something" (p. 54). People who lack 'inspiration to act' are therefore considered unmotivated. In education, motivation often means moving pupils towards a learning goal. Motivation is not something you either have or do not have. It is not even simply a unitary phenomenon that varies in *levels*. There are also various *types* of motivation. The very nature and focus of the motivation can vary just as much as the degree of motivation (Ryan & Deci, 2000, p. 54-55). The distinction between *intrinsic* and *extrinsic* motivation is the most basic differentiation. Intrinsic motivation means to act a certain way "because it is inherently interesting or enjoyable", while extrinsic

motivation refers to when people do "something because it leads to a separable outcome", either to achieve a positive, or avoid a negative consequence (Ryan & Deci, 2000, p. 55). In other words, intrinsic and extrinsic motivation is distinguished by the reasons that generate the action.

Research clearly states that the quality of both the experience and performance of an action is heavily influenced by whether one is intrinsically or extrinsically motivated. In education, intrinsic motivation leads to high-quality learning, while extrinsic motivation is traditionally considered an impoverished form. However, there are various types of extrinsic motivation which can represent active states. If students perform extrinsically motivated actions with willingness rather than reluctance, the value of the task can be internalized (Ryan & Deci, 2000, p. 55-56).

Csikszentmihalyi's (1990) concept of *flow* refers to the mental processes that occur when people are fully absorbed in a task, and flow is "characterized by personal experiences of concentration, energy and success" (Kang & Tan, 2014, p. 111), and can thus easily be connected to intrinsic motivation. Researchers have used the term to explain students' intrinsic motivation when immersed in game-based learning environments. Therefore, flow could potentially help "transfer intrinsic motivation from the task to the subject matter" (Kang & Tan, 2014, p. 111), though this idea lacks sufficient systematic studies. Additionally, most games inherently feature systems that provide extrinsic motivation, such as achievement-based reward systems. Some research on achievement-based rewards found that such rewards can increase intrinsic motivation among participants, especially if connected to increasingly demanding tasks (Kang & Tan, 2014, p. 111).

Several studies suggest that computer games can foster intrinsic motivation through encouraging challenges, curiosity, fantasy, and control (Kang & Tan, 2014, p. 111; Squire, 2005, p. 2). Studies consistently show positive correlations between game-based learning and students' achievements (Huizenga, Admiraal, Akkerman, & Dam, 2009; Tüzun, Yilmaz-Soylu, Karakus, Inal & Kizilkaya, 2009), yet there is no clear consistency regarding whether games impact "students' intrinsic or extrinsic motivation to learn" (Kang & Tan, 2014, p. 111). Nevertheless, literature on games and learning suggests that using games may significantly improve learners' "engagement, interest, […] achievement, motivation, […] and learning" (Kang & Tan, 2014, p. 110). Games can simultaneously support different learning styles and provide learning-reinforcing instructions. Wanting to experience oneself as competent is innate to human nature, as is pleasure arousal, and researchers have found that

participants are more motivated when these feelings are fulfilled (Kang & Tan, 2014, 110). When players perceived themselves as good at the activity or saw swift and steady improvements, Whitton (2007) found that games were motivating (p. 69). Thus, games can facilitate both experiences of pleasure and feelings of competence, which consequently leads to stronger intrinsic motivation towards the gaming activity. Whether this can be utilized to increase intrinsic motivation towards the subject matter, however, is still inconclusive (Kang & Tan, 2014, p. 110).

Utilizing video games in educational contexts can generate both intrinsic and extrinsic motivation among pupils. Games employ achievement-based rewards as well as increase flow, which suggests that it ultimately increases intrinsic motivation. Kang and Tan (2014) found that pupils' intrinsic motivation towards the subject matter significantly increased with the use of game-based learning, and that it was closely tied to the experience of flow (p. 113-114). Consequently, if teachers manage "to extend the context of the game world […] to the content that occurs outside [of it]" (Van Eck, 2009, p. 4), i.e. the classroom content, teachers can connect playing the game to learning in a meaningful way by closing the gap between classroom- and game-content and direct the flow towards the learning objectives. In turn, this can help close the gap between pupils' in- and out-of-school activities, which is crucial for motivation (Aaberg, 2020, p. 7; Henry, 2013; Henry, Sundqvist & Thorsen, 2019, p. 77). Additionally, Squire (2005) found that academically underachievers were particularly motivated by game-based learning (p. 2-3).

However, introducing games into educational settings may also create motivational problems and result in the opposite effect. Pupils might not see how playing video games relate to the curriculum and learning goals, and thus not be immediately motivated. Additionally, some games might need hours of game-play to be truly learnt, which can demotivate pupils. Video games become unmotivating if pupils have difficulties getting started with it, get stuck, experience intrinsic boredom, or lack of trust in the game environment (Squire, 2005, p. 2-3; Whitton, 2007, p. 69). Besides, not everyone enjoys gaming, and no game appeals universally. Thus, bringing games into education does not guarantee motivation, but can function as a motivational tool, especially for pupils who generally lack motivation for school.

Crookes and Schmidt (1991) argue that variation in classroom activities and using less orthodox teaching methods may result in increased curiosity, interest, and motivation, since "change is an essential part of maintaining attention" (p. 489). Therefore, motivation is

closely connected to variation of classroom activities, while monotonous classroom routines may negatively impact motivation (Crookes & Schmidt, 1991, p. 487-489). Video games could thus have positive effect under various circumstances. Firstly, as an uncommon teaching method, pupils' unfamiliarity with game-based teaching could improve motivation in the classroom. Secondly, even if games increasingly become part of education, video games still offer teachers more classroom activities and will consequently still contribute to variation, presupposing that teachers do not over-use game-based teaching approaches. Lastly, there are innumerable games and game-types, which also increases possibilities for variation, as teachers can employ vastly different games in different contexts.

Despite being a key element for successful learning experiences, motivation on its own is not enough to improve the acquisition of skills and knowledge. Many studies on the pitfalls of games in education identify that students tend to focus mostly on the joy of playing and fail to relate the knowledge and skills they could potentially learn through gaming (Sancho et al., 2009, p. 118). Therefore, even though motivation is necessary for learning, using games as motivators also offer challenges that must be addressed and overcome in a classroom setting. This might be achieved by first selecting a game that is not too vast and difficult, thus requiring too much time to learn. Secondly, teachers need to establish clear goals and relate how the use of the game helps the pupils achieve the desired learning outcome, and closely connect the game environment with the learning environment to secure that learning and playing do not occur separate from one another. Ultimately, games can function as powerful tools to increase pupils' motivation and engagement (Kang & Tan, 2014, p. 114), but teachers must ensure that they "strive to make the content, classroom activities, and game world seamless and integrated into a meaningful whole" (Van Eck, 2009, p. 9).

3.3. Multimodality and Learning

There is limited research on the impact of multimedia specifically in video games, which is why this section focuses on multimodality and multimedia learning theories in general and addresses their relevance to computer games for learning (Whitton, 2014, p. 168).

Multimodality is nothing new or unique to video games, yet video games have an unparalleled ability to use several modes to convey information. Multimodality is "[t]he use of more than one semiotic mode in meaning-making, communication, and representation generally" and such modes "include all forms of verbal, nonverbal, and contextual

communication" ("Multimodality," n.d.). This definition indicates that a mode is a singular form of expression, and multimodality is the combination of several modes to convey meaning. Multimodality is often used interchangeably with multimedia, which is the integration of several forms of media, such as text, graphics, audio, video etc. (Lauer, 2009, p. 229). This thesis therefore includes both multimodality and multimedia when referring to multimodality. Thus, text, images, film, animations, colors, graphics, music, sound and audio, body language and anything else one might utilize to express meaning are considered various types of modes (Lauer, 2009, p. 227, 229; Whitton, 2014, p. 168). Modern video games are in their very nature multi-sensory and multimodal, incorporating "visual elements, animations, cut scenes and video, text, speech, sound effects and music" (Whitton, 2014, p. 168), as well as graphics, varying colors, and even body language and facial expressions to communicate various information (Whitton, 2014, p. 169).

Multimedia learning theories build on dual coding theory, which suggests that the human brain consists of two separate cognitive subsystems, where one processes non-verbal information, and the other one language. It follows from this theory that presenting information through both visual and verbal modes should enhance learning. The dual coding theory is widely accepted, despite some researchers find it lacks evidential support (Whitton, 2014, p. 169). Building on this theory, Baddeley constructed a model of working memory that separates between the processing and retention of visual and auditory information (Mayer & Moreno, 1998, p. 312; Whitton, 2014, p. 169). The cognitive theory of multimedia learning assumes that the processing capacity of the two channels are limited. Thus, meaningful learning requires high degrees of cognitive processing from both channels, with both channels retaining, organizing, connecting, and combining information (Mayer & Moreno, 1998, p. 312; Schroeder & Cenkci, 2018, p. 682; Whitton, 2014, p. 169-170).

Accompanying the dual processing hypothesis and multimodality, is the so-called "split-attention effect", which occurs when the same processing channel must process multiple sources of information simultaneously, such as text and picture (Mayer and Moreno, 1998, p. 313-314; Schroeder & Cenkci, 2018, p. 682). Mayer and Moreno (1998) tested the dual processing theory and the split-attention effect in a study of 78 participants, by having identical information presented to two groups of students in slightly different ways. One group was presented with an animation accompanied by written textual information, while the other saw the same animation, but the textual information was narrated. Thus, group one needed visual processing of both animation and text, while group two needed visual

processing of animation and auditory processing of the text. Dual processing theory suggests that pupils in the second group should be able to retain more information since the verbal presentation is narrated rather than written, while written text would cause a split-attention effect for the first group, resulting in less intake and consequently less information being processed. The study confirmed these assumptions as the visual-auditory processing group achieved higher degrees of retained knowledge (Mayer & Moreno, 1998, p. 313-316). They also executed another similar experiment regarding visual and auditory presentations and the split-attention effect of 68 participants (Mayer & Moreno, 1998, p. 316-318), and concluded based on these two studies that "students learned better when pictorial information was accompanied by verbal information presented in an auditory rather than visual modality" (Mayer & Moreno, 1998, p. 318). The authors, however, also point out that their studies have limitations, most notably that the instructional episode used was short and mostly considered lower-level learning. Additionally, they specify that these studies should not be used as a "rejection of the use of text captions with graphics" and highlight other studies that show learning improves when presentation of text corresponds with illustrations rather than when they are presented separately (Mayer & Moreno, 1998, p. 319).

A problematic aspect of the simultaneous use of multiple media is the danger of cognitive overload, where the required cognitive processing ability exceeds the learners' cognitive processing capacity. Like the split-attention effect, cognitive overload can occur when learners receive too much information through a singular processing channel (Moreno & Mayer, 2007, p. 310; Whitton, 2014, p. 172). Therefore, too many layers of multimedia may cause confusion (Sankey et al., 2011, p. 31; Schroeder & Cenkci, 2018, p. 680-682). With games, players might get overwhelmed by the game-play or game interface if it is too challenging, thus resulting in them opting out. By using games for learning, one adds another cognitive overhead, since the learners must learn how to play the game, its conventions etc. in addition to the intended learning outcomes. Therefore, in the context of games and learning, it is detrimental to learning if the game itself proves too challenging (Whitton, 2014, p. 172-173). In their study of cognitive overload from massively multiplayer online role-playing games, Ang, Zaphiris, and Mahmood (2007) found several types of cognitive overloads that caused problems. These include multiple game interactions, social interactions, user interface, and identity construction. Usually, however, the players managed to develop strategies to overcome these overloads. Furthermore, the multimedia effects differ based on the characteristics of the learners themselves (Whitton, 2014, p. 173), and literature indicates that

lower-achieving students benefit more from multimodal learning than higher achieving students since the latter "perform well regardless of how the content is presented" (Sankey et al., 2011, p. 26). Evidence indicates that the multimedia effects "are stronger for learners who start with lower levels of knowledge" and is more effective with older learners (Whitton, 2014, p. 173).

In a study of 60 students on multiple representations of content with the use of multimedia across learning styles, Sankey et al. (2011) found that many students prefer multimodal learning styles. A majority of 35% had a predominant multimodal learning preference (p. 24). The most helpful resources to the students' learning experience comprised multiple representations of the content, and using multimodal representations of particular concepts were useful, though there does not seem to be an optimal combination of modalities. In fact, the "students perceived learning resources with additional representations of content to assist their comprehension, understanding and retention of content, and to be more interesting and enjoyable to use" (Sankey et al., 2011, p. 31). Furthermore, the study did not find any indications of multimodality to cause cognitive overload. Instead, they found sufficient evidence to suggest that a scaffolded multimodal approach "to the provision of key information may be optimal" (Sankey et al., 2011, p. 31). Despite not finding any strong correlation between multimodal representations of content and comprehension gains (Sankey et al., 2011, p. 27, 30-31; Whitton, 2014, p. 171), the authors conclude that the main finding of their study "may be that students like to have options and will gain benefits from those learning styles most suited to their learning style or modal preference" (Sankey et al., 2011, p. 31).

Guichon and McLornan's (2008) limited pilot study on multimodality's effects on French second language learners, measured comprehension in four groups, each exposed to the same video, but with different added conditions of various levels of multimodality. The first group was presented with the audio alone, the second experienced both sound and image, the third group sound, image and first language subtitles, and lastly, the fourth group was exposed to audio, image and second language subtitles (Guichon & McLornan, 2008, p. 85, 87-88). The results show that student comprehension increased with the number of modalities: The two first groups scored 19,7% and 25,1% respectively, while both the subtitled groups scored around 30% (Guichon & McLornan, 2008, p. 89). Despite the limited number of participants with only ten per group (Guichon & McLornan, 2008, p. 91), the results imply that learners benefit from multimodal presentations of information. The authors conclude that

where possible, learners should be exposed to multimodal input. However, visual information which is not directly related to the auditory information appears to cause cognitive overload because it "may distract learners' attention and create split-attention effect" (Guichon & McLornan, 2008, p. 91).

Whitton (2014) presents and discusses further research on multimodality and learning. According to her, Plass, Homer, and Howard (2009) draw on both existing literature and original research when they conclude that learning is enhanced by several factors; when graphical icons are used instead of text, colors are used to highlight key features, and visual representations are used in multiple lessons and contexts that relate to one another. In an analysis of students using commercial video games, Sharrit (2010) found evidence that both "visual and audio media encouraged learning" (Whitton, 2014, p. 172).

The reviewed literature in this section suggests that multimodality, and thus video games, can enhance learning, despite limited research on multimodality specifically in video games. Learning seems to enhance when information is presented using more modes, though one should be wary of potential split-attention effects and cognitive overload. Video games, whose very nature is multimodal, could therefore produce increased learning outcomes by appealing to and suit various preferred learning styles and thus also motivate students.

3.4. Interactivity and Feedback

The amount of required interactivity and the provision of immediate feedback are some of the key characteristics of video games. Their interactive nature and innate ability to offer immediate feedback might enhance learning (Natkin, 2010, p. 161; Whitton, 2014, p. 148). The definition of interactivity varies and lacks consistency, as the nature of interactivity can differ from medium to medium. Here, interactivity constitutes a spectrum of adaptability and user-influence. It is defined in relation to the degree users can modify both the content and form of the mediated environments in real time (Green & Jenkins, 2014, p. 481). For something to be interactive, it "must be responsive in a way that is neither completely controllable nor completely random" (Smuts, 2009, p. 54), which is undoubtedly true for most video games. Many games also function as interactive narratives, since players have ample opportunities to influence the story that unfolds (Green & Jenkins, 2014, p. 481). In other words, interactivity refers to how involved the users are, and to what degree they can impact what happens. Digital games are rich interactive systems that respond quickly to the actions of

players with relevant feedback that engages players and urge them to keep playing. Furthermore, technology-enhanced learning can adapt to the users' learning patterns, accurately model complex environments, enable connections at a distance, and offer new and engaging ways of interaction with various environments (Whitton, 2014, p. 145).

3.4.1. Feedback

Feedback and interactivity are at the heart of game-based learning, as performance feedback is crucial for both learning and continued motivation. Feedback, as in the various ways the game reacts to player actions, forces the players to evaluate the consequences of their own actions before undertaking new actions. This interactive cycle of feedback is fundamental for learning in games (Whitton, 2014, p. 148). Games can facilitate numerous feedback-types, such as visual, audio or explicit feedback based on player-actions, it can come from non-player characters (NPCs), be accumulative (players' relative progression through the game), emotional (e.g. emphasizing with a character), or informative, or relate to feelings of fulfilment (Whitton, 2014, p. 148). In games, feedback is usually formative rather than summative, as it is timely information designed to help players modify their performances to advance further. They can, however, take two forms, either as verification or as elaboration. Verification can be either explicit, such as text boxes explaining that the door cannot be opened, or implicit, such as the door not opening when the players try to open it. Elaboration, on the other hand, can give further information about several aspects, and is thus more varied. Commercial games usually employ verification, as their intensions are typically non-educational, and are therefore based more on game-functionality than learner considerations. Explicit feedback in games can also take many shapes, while implicit feedback often is evolutionary, i.e. the game-world evolves and adapts as a response to player actions (Whitton, 2014, p. 149).

With educational use of games, another issue to consider is the timing and amount of feedback. An extensive literature review by Schute (2008) provides understanding of what type of feedback might be useful in which scenarios. Firstly, the timing of feedback should align with the learning goal, and it is therefore essential to keep in mind that immediate feedback addresses errors in real time and increases immediate learning, while better transfer of learning is associated with delayed feedback. Immediate feedback should be employed for retention, as well as for difficult tasks, at least initially, while relatively simple tasks should employ delayed (Whitton, 2014, p. 150).

Games and education differ in their use of positive and negative feedback. In education, positive feedback is highlighted as an important facilitator of learning, while in games, it is important to balance the positive with the negative, as negative feedback in games forces players to try new things (Whitton, 2014, p. 151).

3.4.2. Interactivity and Engagement

In a study on the impact of interactive learning environments, Ritterfeld, Shen, Wang, Nocera, & Wong (2009) divided 100 participants into four groups of varying conditions. The first group, with the high interactivity condition, played a game, while the other three groups experienced varying lower levels of interactivity conditions by watching a game replay, read a hypertext about the game, and read a text about the game, respectively. The game used was an educational title designed with the purpose of teaching about the human digestive system. The results showed that the group with high interactivity conditions gained higher definitional and overall knowledge than those with low interactivity conditions (p. 692-694). Despite the focus on learning new concepts in this study, and not second language learning, these findings suggest that higher degrees of interactivity can generate positive effects on learning outcomes.

deHaan, Reed, and Kuwada (2010) on the other hand, found that interactivity in video games impacted negatively on learning. They tested the vocabulary recall among 80 Japanese second language English university students, who were divided into two groups. The first group played a music video game, while the second group watched a live video signal of the partner's game-play (de Haan et al, 2010, p. 78). On the vocabulary recall test, those who watched the video averaged 21,7 words, while those who played the game only averaged 7,23 words (de Haan et al, 2010, p. 82). The researchers attributed the lesser results of the players to the higher cognitive load from the high interactivity condition of playing the video game, which in turn hindered language acquisition. However, they also note that the game used in the study did not leave room for players to navigate the song or make meaningful choices about the language, and that using a game that more closely aligns the interactions with the intended language acquisition or granting more choice to the players might result in improved learning outcomes (de Haan et al, 2010, 84-86). This study indicates that for interactivity to optimally contribute to learning, the games used need to be more closely aligned with intended goals, and not be too difficult so as not to cause cognitive overload which takes away from the cognitive processing required to learn the intended outcomes. Furthermore, it shows that simply playing a game to play a game, without attributing associated learning methods to the overall learning experience, is suboptimal for learning from games.

Players' engagement is a central aspect at the core of video game interactivity as players exert effort into the game in hopes to influence the outcome, which they in turn might feel more attached to (Natkin, 2010, p. 161-162). The importance of engagement in video games is illustrated in Salen and Zimmerman's (2004) four modes of interactivity with video games, also called levels of engagement. *Cognitive interactivity* considers players' mental participation in the game, both psychological, emotional, and intellectual. *Functional interactivity* describes the actual controls players use to interact with the game. *Explicit interactivity* regards the players' choices and responses to in-game events. *Beyond-the-object interactivity* relates to the interactions that occur outside of the game-experience itself (Whitton, 2014, p. 151). Therefore, one of the most central aspects of video games is their requirement of players to engage and that they can influence the outcome, which can potentially generate learning pupils feel more closely attached to.

Games used as teaching tools could improve two of Krashen's (1982) affective variables, as it might enhance learners' self-confidence and simultaneously facilitate lower anxiety situations. With traditional teaching tools, pupils often feel unqualified and inapt to state their own opinions or write something original, and instead often seek inspiration on sites like SparkNotes, eNotes and Schmoop (Darvasi, 2016, p. 141). With games, interactions allow for two stories to simultaneously unfold. First, the designer's story which all players experience, and secondly, the personalized story that players' engagement with the game creates through their choices and decisions (Aaberg, 2020, p. 10; Gee, 2006, p. 58-61), rendering the experience both unique and personal. This could make pupils more inclined and feel increasingly apt to go beyond what is already written by others (Aaberg, 2020, p. 10; Colby & Colby, 2008, p. 308). Pupils might feel less confident and more anxious when working with materials that other more qualified people have already tackled. Being the sole expert of their own story could therefore increase their confidence and make them more inclined to rely on their own skills. Additionally, the relative novelty of the video game medium, which is usually associated with younger people, could also render games a less intimidating teaching tool. It should benefit their learning if pupils work confidently in lower anxiety learning situations, which games have the potential to facilitate.

Less research exists on the correlation between interactivity and motivation, but some existing studies suggest a positive effect. Students' intrinsic and overall motivation increased significantly when taught with various interactive educational games compared to more traditional teaching methods (Kang & Tan, 2014, p. 114). Tüzun et al. (2009) found similar

results after using an educational computer game for three weeks in an elementary school. Game-based activities even reduced pupils' focus on grades and increased their independency. The positive findings are attributed to the participation in "game activities that offered exploration, interaction, and collaboration […] and meaningful real-world events" (Tüzun et al., 2009, p. 74).

Though the limited existing empirical evidence makes it difficult to state anything conclusively, the studies and research reviewed here suggest that interactivity and feedback integral to games can positively affect pupils' learning. Immediate and delayed feedback on in-game actions and their consequences may intensify the game effects, which can lead to increased enjoyment and motivation, and consequently learning (Weber, Behr & DeMartino, 2014, p. 79-80). Games can offer unique and personal game-play experiences where pupils become the experts, thus facilitating self-confidence and low-anxiety learning situations. One should, however, be wary of cognitive overload since fewer resources for cognitive processes remain if playing the game is mentally challenging (Weber et al., 2014, p. 79). The level of interactivity affects learning, and too many interactions might make games unattractive learning tools, while too little interaction might hinder motivational drive and feedback, and thus learning. Therefore, before a game is introduced to educational contexts, the game should be critically assessed in terms of levels of interactivity required in relation to cognitive maturity of pupils and the intended learning outcomes.

3.5. Immersion and Identity-development

Immersion, often used interchangeably with 'presence' (Whitton, 2014, p. 161), is "the illusion of experiencing a virtual environment as if it were akin to the real world", which requires factors such as time, attention, and energy from the players, and includes the emotions experienced by them (Rativa, Postma, & Van Zaanen, 2020, p. 689). Players' feelings and thoughts are influenced by empathy and game atmosphere, such as graphics, sounds and plot (Rativa et al., 2020, p. 689). The feeling of place in games is constituted through the physical characteristics of both characters and the environment, emotional associations, and the possibilities for actions and interactions, and is thus key for immersion. Researchers have tried to distinguish between types of immersion relating to games. Different scholars use different terminology, but they all concern distinctions between immersion as being absorbed by the game, and immersion as the illusion of actually being present in the

game environment (Alexander and Brunye, 2005; Calleja, 2011; Lombard and colleagues, 1997). Evidence suggests however, that the two dimensions of immersion corelate (Whitton, 2014, p. 161). Some scholars argue that people are unable to completely suspend disbelief, which renders full immersion impossible. Regardless, enough immersion is possible to "temporarily lose track of time, forget surroundings, and desire to exist in the gamespace" (Colby & Colby, 2008, p. 304).

An important term relating to immersion and identity is *identification*. Identification relates to the mental process where one temporarily imagines "oneself in the position of another person" and can occur both in real life and through mediated communication (Riet, Meeuwes, van der Voorden, & Jansz, 2018, p. 183). Many scholars distinguish between two levels of identification in media, namely *wishful identification* where one desires to be or act like the character, and *similarity identification*, where users identify with the character due to embodying similar characteristics (Riet et al., 2018, p. 183).

Arguably all types of literature and fiction are immersive, but video games might offer stronger immersion than most other fictions due to its applications of multiple sensory inputs and potential for generating feelings of flow. Whitton (2014) notes that one of the most powerful aspects of games for learning is the ability for games to "immerse [players] in a world of fantasy and imagination, where identity and accepted behaviours differ from reality" (p. 131). The effect of immersion on learning, especially in constructing authentic situations learners can 'inhabit', might be enhanced using video games in education. Furthermore, relating to characters, adaptability of personal characteristics such as avatars, and consequent exploration of personality and identities are forms of immersion that can help explore one's own identity. This section aims to explore how immersion in games impact learning in general, as well as how it might affect identity-development in players and pupils.

3.5.1. Immersion and Identity

Dolby and Rahatzad (2018) examined how undergraduate teacher students learned from and reflected on their own identities, values, upbringing, and beliefs about discrimination through an experiential learning assignment called 'Immersion Experience' with the aim to deepen their understanding of diversity. Students increasingly spend "their time online, self-segregated and fractured by political beliefs and social identities", and the 'Immersion Experience' required them to briefly experience a cultural context that differs from their own (Dolby & Rahatzad, 2018, p. 7). The goal of experiential learning is to transform learners "from passive recipients of knowledge" to participating learners in a

learning process that "involves reconciling different ways of seeing in and acting in the world" (Dolby & Rahatzad, 2018, p. 9), and can take various forms. At the core of the 'Immersion Experience' is the philosophical belief that diversity cannot simply be taught through a book, but necessitates experiences of cultures, races, and ethnicities. Students in this study were required to attend an event sponsored by either a U.S. minority or international group they themselves were not a part of, and the experience was "followed by structured reflection and class discussion" (Dolby & Rahatzad, 2018, p. 12). After attending the events, the students handed in a short paper reflecting on how their experiences were shaped by their own social identities (i.e. gender, race, class, sexuality, and nation), with emphasis "on how they felt as members of a minority" and how an individual's social identity profoundly shapes their life experiences and chances (Dolby & Rahatzad, 2018, p. 13). With limited personal multicultural experiences, students usually draw on representations from other secondary sources such as media and school curricula, which unfortunately creates misrepresentations and stereotypes. One's world view is shaped by practices and patterns of discrimination, as well as daily experiences of simply being a minority (Dolby & Rahatzad, 2018, p. 15-17). The authors note that one of the most significant outcomes of the assignment was the opportunity for these students to interact with actual live people of different backgrounds and life experiences. Furthermore, "the assignment provided […] a deeper understanding and appreciation of how important experience […] can be to the learning process" (Dolby & Rahatzad, 2018, p. 18). The findings support the authors' philosophical belief that diversity cannot be taught through books but must be experienced through real-life encounters (Dolby & Rahatzad, 2018, p. 23). This indicates that immersion can increase both learning and identity-development. However, with this study's focus on physical immersion, the question yet remains whether the immersive properties of games could suffice to facilitate experiential learning like the 'Immersion Experience', or at least be an acceptable alternative in contexts and situations where such real-life experiences are not possible.

Several factors contribute to immersion. Whitton (2014) presents aspects of presence that impact learning. The game's *quality of social interaction* influences the sense of being present with others and is essential for creating intimacy and feelings of togetherness. As does the degree of *realism*, both social (interactions with people) and perceptual realism (interactions with environment). Whether the immersion is *perceptual*, by blocking out the real-world using accessories such as goggles and headphones, or *psychological* such as achieving the state of flow, as well as the *use of a social actor in the medium*, affect the

immersion and learning with games. Lastly, players should be able to respond to the computer itself as an intelligent social agent and thus participate in an *intelligent environment* for immersion and learning to occur (Whitton, 2014, p. 162). Furthermore, the number and consistency of sensory outputs, image quality, user experience and players' willingness to suspend disbelief are important. Witmer and Singer (1998) hypothesized that presence-contributing factors could be sorted into four areas, namely the degree of control felt by the player, sensory factors, levels of distraction, and the amount of visual and functional realism. Players' personal abilities are more important for immersion than technological advancements, as lack of social cues and insecurity lead to lower degrees of immersion, while emotion, motivation, enthusiasm, and engagement increase feelings of immersion (Whitton, 2014, p. 163).

Utilizing virtual worlds that generate feelings of 'presence', so called immersive learning experiences allow more complex social interactions and designed learning experiences than traditional approaches which focus primarily on textually-based knowledge, transfer strategies and dialogic interactions between tutor and learners. The increased interactivity also encourages learner empowerment and aids bildung (de Freitas, Rebolledo-Mendez, Liarokapis, Magoulas, & Poulovassilis, 2010, p. 69). At the heart of such immersive learning experiences is the learners' presence through avatars in the virtual space, which facilitates greater control within the virtual environment and represents the users' embodiments (de Freitas et al., 2010, p.70). The "emerging field of serious games and virtual worlds" attempt to reconceptualize traditional learning approaches to focus learning on experience and exploration by emphasizing "learner control, greater engagement, learner-generated content and peer-supported communities" (de Freitas et al., 2010, p. 71). Though de Freitas et al. (2010) concern themselves with online, virtual open worlds, their study can be applicable to games that offer virtual realities in various degrees.

de Freitas et al. (2010) used a four-dimensional framework to evaluate the efficacy of using immersive virtual worlds for learning (p. 69, 72). The first dimension focuses on the learners themselves to match the learning activities with the intended outcomes and highlights the importance of learners' interaction with their environment. The second dimension considers the learning activities' pedagogical perspective and teaching methods intended to support the learning. The third dimension concentrates on outlining the representation itself, considering the level of interactivity, fidelity "and how immersive the experience needs to be" (de Freitas, 2010, p. 72). The last dimension evaluates the context, what impact the

environment has on the learning, such as whether it is in school or informal settings, what subject is taught, and which supporting resources are being used. The four dimensions depend on each other, but jointly, they conceptualize a "framework for exploring immersive learning" (de Freitas, 2010, p. 72).

Fantasy, as "the element of make-believe that underlines […] games"; "that which is not real", has been highlighted as a fruitful motivational element in educational games (Whitton, 2014, p. 135). It can constitute both intrinsic and extrinsic motivation, depending on whether "the fantasy is closely interwoven with and fundamental to the structure of the game" or not (Whitton, 2014, p. 135). Such elements of fantasy can relate to locations, characters, story, and dialogue, and provide the background of a game. Fantasy in games is proposed to be a key factor for immersion by "allowing identification with the game world through the ability to control and relate to the characters and environment", create a sense of analogy between game and real life by presenting novel experiences that are nonexistent in real life, and generate feelings of fulfilment and enjoyment (Whitton, 2014, p. 135). Yet, fantasy is one of the elements met with most resistance in educational contexts, as it is considered frivolous and inappropriate. Therefore, the degree of realism, verisimilitude and transferability of the fantasy elements will impact students' willingness to engage with the game (Whitton, 2014, p. 135).

The diegetic aspects of games, i.e. the representations of the virtual world and its fluidity, can negatively impact the learning, especially if it does not meet the expectations of the learners. When working with virtual worlds, learner expectation is a factor tutors need to be aware of and address, and the use of virtual worlds in education should be accompanied by other learning activities. This creates hybrid spaces and experiences where fruitful reflections can manifest by using what happens in the diegetic virtual world as metaphors that can be extra-diegetically discussed and otherwise worked with (de Freitas, 2010, p. 78-79). Learners' background might also impact their ability to engage with the format, as well as their ability to immerse themselves into the virtual experience, which could hinder learning efficacy (de Freitas, 2010, p. 78-79).

Despite the assumption that virtual worlds offer greater learning potential than other types of games and learning approaches, assessing and validating the efficacy of virtual worlds for learning proved challenging. The findings indicate that the platform is not a suitable format to use with learners. This is largely due to technical issues experienced, and thus the true learning potential of the platform remains unclear (de Freitas et al., 2010, p. 80-

81). Additionally, the findings might indicate that the particular type of open-world used in this study required too much cognitive processing to facilitate learning. Therefore, other types of virtual worlds may still have beneficial effects on learning. Especially if scaffolded properly by a qualified teacher and supplemented with appropriate extra-diegetic learning activities.

Rativa et al. (2020) analyzed the impact visual appearances of virtual game characters have on empathy and immersion, conducting a four-condition experiment with 100 participants. User experience can improve with "[e]mpathic interactions with animated game characters", as well as facilitate increased "immersion, and achieve better affective outcomes" (Rativa et al., 2020, p. 685). Their findings show that players self-reported higher levels of empathy and immersion when there was "congruence in appearance and facial expressions of virtual animals" and that the appearance of the virtual animal influenced user experience (Rativa et al., 2020, p. 686). In other words, virtual representations of appearance and facial expression that correspond with players' conceptualization increased empathy and immersion. Empathy, here, refers "to the ability to share the feelings and thoughts of other people and take another person's perspective", which can be associated with positive and negative feelings alike (Rativa et al., 2020, p. 686), or rephrased; the capacity to 'put oneself in someone else's shoe'. Rativa et al. (2020) also differentiate between cognitive and affective empathy, the latter being "the capacity to recognize emotional reaction" and the first being "the capacity to perceive and predict the feelings of others" (p. 686-687). The remaining issue concerns what happens when that 'someone else' is a virtual character, or furthermore, a virtual non-human character.

The effect of violent video games on young people is fiercely debated with no clear concession among researchers. However, some studies suggest that they "can stimulate aggression, decrease pro-social behavior, increase mood changes, and impulsivity", and thus arguably lead to apathy (Rativa et al., 2020, p. 687). Simulation games have proven potential as powerful learning and social skills developing tools through use of virtual characters, which can foster empathy by enabling players to adopt new perspectives through immersion. Empathy might be developed through video games, either by virtual agents showing empathic emotions towards players, or by players expressing empathy towards virtual agents. Existing literature indicates a strong relation between empathy and immersion, especially situational empathy in the context of virtual simulations, in which the feeling of immersion can be enhanced by increasing the realism of the virtual experience (Rativa et al., 2020, p. 687, 689-

690). Rativa et al. (2020) therefore conclude that the body appearance and facial expressions of virtual characters can increase self-reported empathy and the level of experienced immersion, finding a positive correlation between empathy and immersion, which affects the user experience (p. 705).

Many researchers suggest persuasive games have great potential to positively impact social change. The theory behind persuasive games is as follows; persuasive games' interactive nature closely links the persuasive information to the players' self, which in turn leads to increased immersion and identification. Little research investigates whether persuasive games in fact generate more immersive experiences "or are more likely to foster identification" compared with other media, nor has substantial research been conducted on whether these two aspects relate to persuasive outcomes (van t' Riet, Meeuwes, van der Voorden and Jansz, 2018, p. 180-181). Digital technology can facilitate decreased distance between information and user by responding to player's actions and making the consequences directly self-relevant to them. Digital games can "challenge players to experiment with several courses of action and explore the consequences of the actions" (van t' Riet et al., 2018, p. 181). Studies of persuasive games have been inconclusive, and lack of substantial empirical data to evaluate their effectiveness renders it impossible to "derive conclusions on the genre as a whole" (van t' Riet et al., 2018, p. 181). Furthermore, van t' Riet et al. (2018) tested whether persuasive digital games, designed "to influence players' attitudes and/or behavior" in relation to social and political causes, had effect on immersion, identification, and willingness to help through three studies of 131 participants (p. 180, 183). Their results indicate that persuasive games, relative to the control conditions, did not generate substantially greater willingness to help. The authors thus conclude that despite the theoretical potential of persuasive games, their study functions as a warning that not all persuasive games will be more persuasive than other non-interactive forms of media (van t' Riet et al., 2018, p. 192). Their findings show that games are not an inherently superior educational alternative to traditional media. The efficiency of games for learning depends on which additional teaching methods are used, as well as the characteristics of the pupils, and should be considered in relation to the overall education to ensure that teaching remains varied, motivational and of high quality.

One of games' most powerful learning-supportive features is their ability to move players to see the world in other ways by enabling them to take on roles, other personas with their own goals, ambitions, and behaviors. Whitton (2014) highlights the notion of games as a

'magic circle', functioning as "a boundary between real life and the reality of the game" that allows players to enter an 'other world' where different rules, morals and behaviors apply (p. 131). Furthermore, the magic circle "temporarily transform[s] people, places and activities" which "provides massive learning potential" (Whitton, 2014, p. 133). Developing empathy for characters is crucial for creating affective experiences and thus learning, and there are several types of characters in games and narratives. In addition to player characters, NPCs function in various roles of differing importance. Players most effectively empathize with characters that are in some way similar to themselves, be it race, sex or personal experience (Whitton, 2014, p. 141).

Gee (2007) argues that any form of learning requires taking on new identities and form bridges between the new and old identities. This is even more prevalent in video games. In addition to recruiting identities, video games "encourage identity work and reflection on identities in clear and powerful ways" (Gee, 2007, p. 46). By providing alternate environments, games create settings in which players can experiment and explore their identities, different roles, genders, appearance, and styles and ultimately create environments where players can feel they 'belong' (Whitton, 2014, p. 157). Adopting and playing with various identities is important for both learning and overall development, and Gee (2007) argues that players of video games where they take on virtual characters, engage with three separate identities simultaneously. The *virtual identity* is the "identity as a virtual character in the virtual world" (Gee, 2007, p. 49), the diegetic persona acquired. The second identity at stake is one's *real-life identity*, as in the person playing the game, while the third identity Gee (2007) dubs the *projected identity*, meaning projection both as projecting personal values and desires on the virtual character, and in the sense of considering the virtual character as a projection of oneself (p. 49-50). The projected identity exists in the interface and interplay between the virtual and real-life identity of players and is thus the most difficult type of identity to grasp, but arguably also the most important to understand. It is in the interplay and exploration between identities, called the Identity Principle, learners have real choices in creating new identities and mediate between the new and old identities (Gee, 2007, p. 64; Whitton, 2014, p. 157).

Exploring the role of identities in games, and their role regarding learning, Whitton (2014) relates further theories and research. Hand and Moore (2006) offer three approaches to the question of identity in games. Firstly, the *social identity*, which is socially defined by both who we are and who others think we are, is negotiable, i.e. 'gamer'. Secondly, the *reflexive*

self-identity constitutes how players self-consciously develop their identity through game-play. Thirdly, the *virtual identity* considers identities to be dynamic and re-written through constant interaction with others and artefacts. Player characters enable players to re-envision their own identities by reaching beyond traditional identities limited by one's age, sex, class, and ethnicity. Avatars are important to immerse players into their in-game identities and the game world and thus has an interdependent dual role as both players' embodiments and game-characters, enabling players to fluidly switch between participator and spectator. Anetta, Klesath, and Holmes (2008) found that students with more control over online self-representations felt greater social presence than those with more restricted choice. However, in educational contexts, outlandish avatars may be considered inappropriate, or even controversial. Additionally, many games, such as most adventure games do not enable personalized avatars, but still manage to enable exploration of identities (Whitton, 2014, p. 157-160).

3.5.2. Immersion in (Game) Narratives

Storytelling is vital for many types of digital games and includes both the story and the way the story is presented. In other words, "[game n]arrative encompasses the idea of a story […] true or fictional […] and the way in which games are used to tell that story" (Whitton, 2014, p. 136). Storytelling entails more than a causal sequence of events as it also involves progression, change or the effort not to change, and is set in consistent narrative worlds where characters both experience and interact with events and other characters. Additionally, game narratives include game-play. The debate concerning whether games can be considered narratives or not is long-running. Since narratives describe everything humans do, and many games feature narrative characteristics such as quest structures, reversals, and protagonists, they can be considered narratives. On the other hand, games differ from narratives because the story can usually not be retold in another medium, time functions differently because interaction and narration cannot simultaneously exist, and the relationship between player and story differs from that of observer and story in other narratives. Many games even have non-anthropomorphic actors. Nor do all games tell stories, and game-experiences cannot simply be reduced to the experience of a story. However, neither game-play nor narration need necessarily come at the expense of the other, but can work together to create an experience, since games are about actions and thus external, and stories are about emotions and thoughts, and thus internal. Many games, especially COTS, do have narrative aspirations, and game narratives have three functions; they provide the context for the game events, provide

identification with central characters, and create a reason for action, all of which contribute to immersion. Whitton (2014) notes that there are three key differences between traditional narration and game narratives. Players' ability to *interact* with and influence the narrative development, combined with the *agency* of becoming the actors rather than the observers, leads to greater *immersion*. Full agency in games is rare since the games usually offer a set of fixed routes players can follow. However, perhaps more important than complete agency, is the feeling of control and choice. Scholars also distinguish between interactive storytelling, or 'games of progression', such as adventure games, and 'games of emergence', such as role-playing games (Whitton, 2014, p. 136-138). Regardless, games offer a powerful learning tool that can provide motivation, empathy, investment, and learning through the experiences of others (Whitton, 2014, p. 141).

Robson and Meskin (2016) argue that certain types of video games are the most prominent form of what they coin 'self-involving interactive fictions' (SIIFs) as they in some important and distinguishable way are "about those who consume them" (p. 165), i.e. the players. The authors argue that through interactions with video game fictions, the games themselves genuinely become about the players as much as they are about the story of the game (Robson & Meskin, 2016, p. 165-166). Two main arguments are highlighted to support the idea that video game fictions are self-involving. Firstly, the linguistic argument emphasizes how players converse about game experiences with frequent use of first- and second-person claims such as "I defeated the dragon" (p. 167) and "You beat Galactus" (p. 169), indicating personal affiliation and identification with the game-character. Secondly, the authors argue that games come to contain fictional truths about the player as players and their game-characters blend and overlap (Robson & Meskin, 2016, p. 167-169). Therefore, through diegetic decisions, players are put off by morally questioning instances in video games because they, by playing the game, at least partially, imaginatively perform the questionable actions themselves. This, Robson and Meskin (2016) argue, also contributes to the "persistent level of moral concern that [games generate]" (p. 170). The authors' arguments suggest that games' immersive experiences can enable identification with game characters and can as such create powerful immersive environments that could potentially facilitate experiential learning situations.

Killin (2017) however, contends Robson and Meskin's (2016) SIIF view. A closer look at linguistic practices among players shows that they mix first- and second-person, self-involving language with ludic language in game contexts. This diegetic and extra-diegetic

difference in lingual practices is evident in video games where players might state that "It took me forever to kill the Shaman; it had 88 health points" (Killin, 2017, p. 182). The use of 'me' indicates self-involving language, while the Shaman having 88 health points is an extra-diegetic observation expressed through ludic language. Killin (2017) argues that though there might be some marginal truth to the idea that playing games make things fictionally true of players, "we should be cautious about what acknowledging these fictionalized truths actually commits us to" (p. 183). Furthermore, he asserts that Robson and Meskin's (2016) SIIF view has collapsed "the distinction between playing a game and *role* playing it" (Killin, 2017, p. 183). With role-playing games, players often adopt characteristics they think their characters would have, such as certain speech patterns and in-game behaviors. In such cases, "players do seem to be imagining that they are their avatars" (Killin, 2017, p. 184), but this is arguably not the case when simply playing a game, because players also process and respond to non-diegetic information. Regarding the moral criticism argument, Killin (2017) admits that Robson and Meskin (2016) might be right, but remarks that morally questionable in-game scenarios that make even seasoned players uneasy are atypical and rare. Mostly, players are not uneasy by performing in-game actions we otherwise would condemn, such as killing guards to achieve game objectives (Killin, 2017, p. 184). Killin (2017) thus concludes "that the ludic nature of video games operates to limit the sort of imaginative self-involvement identified by Robson and Meskin" (Killin, 2017, p. 184).

The research and literature explored in this section (3.5) indicates that the immersive qualities of games can positively impact learning and create experiential learning situations by facilitating emotional attachment and identification with both characters and environment, especially representations that are realistic or coincide with players' conceptions. An important element for learning and bildung is games' ability to enable various explorations of identity and the consequent interplay between identities. Using games in education might promote identity-development, which is emphasized in Norwegian curriculum.

3.6. Games as Learning Environments and the Importance of Play

Whitton (2014) argues that games' playful quality grants them immense potential and power for learning. Yet, games for play might be the most neglected area of game-based learning, since the playful aspects of games are often conceived as inappropriate for learning contexts. However, play is fundamental to the development of humans and can powerfully

influence learning by promoting both creativity and engagement, as well as enable mastery of developmental tasks, while providing safe environments for exploration and practice (Whitton, 2014, p. 111). Play is difficult to define, and many scholars emphasize it as a voluntary action. This offers challenges regarding play in educational contexts since formal contexts are not voluntary and would consequently remove all elements of play from any activity. Therefore, Whitton (2014) offers a different definition: play should "involve freedom, joyfulness and fun, but […] is [not] contingent on the voluntary nature of the activity" (p. 113). Furthermore, Whitton (2014) presents Brown and Vaughan's (2010) six stages people progress through when playing. First comes *anticipation*, waiting expectantly and feeling curious, followed by *surprise* when experiencing unexpected things, new sensations, or shifting perspectives. Then players experience *pleasure* in the activity, before moving on to *understanding* through acquisition or synthesizing of knowledge. The fifth stage is *strength* and encompasses feelings of empowerment through mastery based on experience and understanding. Lastly, when finishing to play, players reach the stage of *poise*, or contentment. This model indicates that the play experience can assume the role of transformative experience, which in turn can enable greater learning and understanding (Whitton, 2014, p. 113-114). Meaningful play develops from both the game-playing context and through interactions between players and the game and can be defined in two ways. Games are *descriptively* meaningful if the outcomes generated by actions and interactions make sense, and they are *evaluatively* meaningful when the outcomes are emotionally and psychologically integrated into the game experience. An essential element to play and learning is fun, as in a source of enjoyment and can evoke both physical, emotional, and psychological sensations. Mastery of a task, or as in the moment when we learn something new, is one of the most important sources of fun. Therefore, learning and fun are closely linked. Entertainment games build on fun, as the entire point is to give players pleasurable experiences that make them want to return and play more (Whitton, 2014, p. 114-116). With progressively advancing visuals and realism, digital games are increasingly capable to engage players emotionally through narrative and characters they feel invested in. Additionally, emotions enhance memories and motivate the drive for learning, thinking and problem-solving. Therefore, it stands to reason that digital entertainment games that provide fun and emotionally engaging experiences in safe exploratory spaces have great educational potential. However, too much emotion can cause mental blocks and remove focus from learning (Whitton, 2014, p. 118-119). Nevertheless, fun is detrimental for learning and development as it can "enhance optimistic thinking and problem-solving abilities, reduce stress and increase

emotional and physical resilience" (Whitton, 2014, p. 120). Furthermore, fun is also linked with humor, which can positively impact learning by reducing anxiety, diffuse anger, create positive attitudes towards the teacher, increase attention and interest, as well as promote safe learning environments. Despite its huge potential for learning, the actual impact of fun on learning will be dependent on the learners' perception of the appropriateness of fun in educational contexts. Whitton (2014) stresses that despite widespread conceptions that learning should be serious rather than fun, games' true potential in education is the fact that they should be fun (p. 120-121).

Colby and Colby (2008) argue that traditional distinctions between 'work' and 'play', and 'classroom' and 'gamespace' construct barriers for computer games' integration into education. They focus particularly on how games can be utilized in the writing classroom, where games typically have been rendered objects of analysis, rather than powerful learning tools. The evolution of computer game theory linked to learning closely resembles "the theoretical and pedagogical evolutions of writing instruction" (Colby & Colby, 2008, p. 300). Therefore, it stands to reason that game theory, including both narrative and play, can be practically utilized to teach writing in the classroom, thus combining game theory with writing pedagogy. In their article, Colby and Colby (2008) suggest a pedagogy of play based on active participation where students must research and write a number of self-determined game-related texts. Referring to several studies and research, Colby and Colby (2008) argue that computer games can benefit students and help them "apply, synthesize, and think critically about what they learn through active and social participation" (p. 301). Additionally, online game-forums offer students opportunities to produce meaningful text that does not feel like producing text merely for the teacher. Furthermore, the researchers propose that the reason games have not been fully incorporated into writing classes, is due to the culturally developed conception of work and play in the classroom as binary opposites (Colby & Coby, 2008, p. 300-303). Interestingly, work and play has historically been intertwined and interdependent on each other, rather than rigidly separate concepts, and "imagining the classroom as a type of gamespace can […] erase the work/play distinction", providing pupils with a safe and *pure space* (Colby & Coby, 2008, p. 303). Furthermore, if applied with deliberation, nothing hinders the game objectives to align with the course objectives, and introducing games to the writing classroom offers a safe space for failure, as well as provide reactive assistance to achieve intended goals (Colby & Colby, 2008, p. 304-305).

Modern games can function as experimental spaces as they grant players more freedom and feelings of control through increased choice of action and opportunities to augment the game environments. This creates safe 'training' spaces for players in which they can hone various abilities by making mistakes in spaces where real-life consequences are lower. Games provide players with freedom to experiment, fail, fashion identities, and freedom to decide how much effort they exert into the game. However, one should not blindly assume that games create safe environments, as there are potential hazards one should be aware of, especially when implementing games into educational contexts. If the learning environment feels unsafe to begin with, implementing games will not magically fix this, and the notion of assessment risks the safety games afford. Furthermore, some pupils might prefer controlled environments over freedom, and it is not necessarily freedom that engages players, but rather the 'feeling of freedom'. Good games are designed to be engaging, yet no game can offer absolute freedom. There will always be limitations to the freedom in games as any possible action needs to be built into the design. Therefore, games truly only offer players limited sets of choices, though the number of choices might vary, and the limitations might be efficiently concealed (Whitton, 2014, p. 122-124). There are various ways players' freedom can be restrained; from limiting the number of choices available; direct players' attentions through game goals; the interface; suggestive music that influences the players' mood; or implementation of various non-player characters that players "want to protect, obey, help or destroy" (Whitton, 2014, p. 124). Whether the feeling of freedom is real or perceived, it is interlinked with feeling of control in games. Once more, complete control is impossible, but the feeling of control can be extensive. Increased perception of control is influenced by the number of available choices, how logical the interactions are, whether outcomes seem to be responsive to the players' actions, and to what extend player actions have large and noticeable effect in the game environment. Evidence suggests that experiencing autonomy and in-game competence relate to enjoyment and well-being, which is important for any learning environment. Game design supports these effects by providing players with regular achievements as well as illusions of freedom and control (Whitton, 2014, p. 124-125).

Games can also facilitate exploration and promote experimentation and creativity, which are powerful tools for learning. Different types of games offer varying degrees of freedom to explore, from no options in a linear sequence of events, to open ended 'sandbox' games in which players are left to their own devices. In educational contexts, one needs to be especially aware of the problems that arise using the various forms of games. Sandbox games

offer great potential as 'possibility spaces' for exploration and learning, yet are also problematic if the activities undertaken do not match intended learning outcomes, which can be hard to track when players wield great freedom in the game. Furthermore, with self-directed exploration learning, pupils might not manage to recognize and transfer what they learn without guidance and reflection, and guidance becomes increasingly difficult with more freedom, as every players' experience is unique. Nevertheless, self-directed exploration and discovery in virtual environments may stimulate curiosity. Curiosity is the feeling of being deprived of something, and simultaneously wanting to find out what one is deprived of. This feeling generates a wish to learn something new (Whitton, 2014, p. 125-127).

When merging the classroom with gamespace, computer game theory may inform pedagogy. Emergent and progression gaming are two such theories. Progression games enable players to linearly follow a series of seemingly fixed challenges, while in emergent games, players explore a constantly changing gamespace that adapts to the players' actions, allowing each player to create their own game experience. A pedagogy influenced by emergent game theory creates playful spaces in which students can explore, discover, and create their own challenging assignments within the classroom environment (Colby & Colby, 2008, p. 305). When introducing a game-based emergent approach in the classroom, one must inform the pupils that they will not simply play the game, but that they are expected to do other work as well, for instance substantial writing. Teachers can also make use of pupils who are more advanced gamers or might even have played the game in question before. These pupils can initially help the other, less experienced gamers. Throughout, the students need to understand the learning objectives and how playing the game contributes to achieving them, as well as collaborative guidance from the teacher (Colby & Colby, 2008, p. 307-309). Conclusively, an emergent approach to game-based teaching incorporates play into learning and intertwine them, enabling the pupils to both direct their own learning and become the experts of the topic. The authors stress that the "mere playing of the game" will not increase students' learning but can rather "engage students in complex ways" (Colby & Colby, 2008, p. 310).

The idea of games providing a 'magic circle' is essential for games and learning, as it relates to games' ability to provide safe spaces for learning where mistakes are not simply accepted, but even customary. This notion of a magic circle is controversial, as some scholars argue that everyday rules and experiences cannot be removed from game-playing experiences. However, the idea of the magic circle should not be considered to exist outside of reality, but rather as a liminal space that exists in continuity with it (Whitton, 2014, p. 132). While failure

in education typically is "constructed as a bad thing", failure in games "is seen as an acceptable and inevitable part of the gaming process, and fundamental to the learning within games" (Whitton, 2014, p. 133). Since game experiences "cannot be completely removed from real life" or the learning context where other external factors may impact the 'safe space', the extent of safety games offer has been questioned (Whitton, 2014, p. 133). However, some argue that the play which occurs within a game and thus creates the magic circle, creates a universe that is restricted, closed and protected (Colby & Colby, 2008, p. 303). If pupils experience the magic circle as a safe environment in which they are free to make mistakes without any real repercussions, the learning environment will help reduce the levels of stress, and thus enable greater individual learning. Furthermore, Whitton (2014) argues that structured briefing and especially debriefing activities may ease the transitions in and out of the magic circle. She further emphasizes that the discursive activities surrounding the game-play are important to learning with games, not just what happens during the game itself. It is in debriefs pupils can reflect on and share their game experiences which can turn into meaningful learning. Debriefing is crucial to any learning experience as people learn from experiences only when they reflect on and derive useful lessons from them, which they can find ways to transfer into other contexts (Whitton, 2014, p. 133-134).

Moreno and Mayer (2007) explore interactive multimodal learning environments grounded in a cognitive-affective theory of learning and derive empirical support for five design principles, namely guided activity, reflection, feedback, control, and pretraining. The modality principle suggests such learning environments constitute the most efficient learning environments but are dependent on the actions of the learner. The authors also note the risk of cognitive overload with interactive multimodal learning environments (Moreno & Mayer, 2007, p. 309-314). The first principle, *guided activity principle*, describes activities where students' cognitive processing is guided through interactions with a pedagogical agent, as pupils learn better when interacting with a guiding teacher (Moreno & Mayer, 2007, p. 315-317). In fact, research shows that learners rarely engage in educationally relevant activities if they are left to their own devices during collaborative learning contexts (Sancho et al., 2009, p. 116), which highlights the need for a guiding pedagogical agent. Deep learning depends on the second principle, *reflection*, since students' learning improves when they reflect upon actions and answers during the meaning-making process. Reflection encourages active organization and integration of new knowledge. *Feedback* enhances learning by reducing extraneous processing, while the fourth principle allows students greater *control* of the

instructional presentation's pacing. This allows students to process less information in working memory at any given time. *Pretraining* concludes that learning improves when focused pretraining activates or provides relevant prior knowledge (Moreno & Mayer, 2007, p. 315-321).

3.7. Games, Critical Thinking and Deep Learning

Higher level learning signifies more advanced learning than mere knowledge acquisition and includes deep learning and critical thinking. Deep learning requires cognitive activity to select relevant information, mentally organize it, and combine new knowledge with existing knowledge (Moreno & Mayer, 2007, p. 312). In other words, transfer of knowledge and applying new knowledge in other contexts is part of deep learning. Critical thinking relates more to the ability to make reasonable and justified judgments as well as to one's capacity to operate with and process complex ideas (Cicchino, 2015). Yang and Wu (2011) define critical thinking as the ability to reflectively judge what to do or believe, and they deem it increasingly important for evaluating the authenticity of received information in our highly technological modern age. At the core of critical thinking is recognizing assumptions and evaluating arguments through deduction and interpretation (Yang & Wu, 2011, p. 341-342). Games have the potential to facilitate such higher-level learning.

Research highlights student discourse as important in the construction of knowledge and fostering of critical thinking skills. There is, however, still "a gap in understanding how [game-based learning] affects critical thinking […] when implemented in traditional classroom environments" (Cicchino, 2015, para. 1). Cicchino (2015) examines how game-based learning relates to promotion of content knowledge and critical thinking in otherwise traditional school settings. In game-based learning environments, students typically work together in small groups and make meaningful choices to solve challenges within multimodal problem spaces. In terms of content knowledge acquisition, Cicchino's (2015) findings indicate that traditional approaches are equally good or even favorable to game-based learning. However, the findings also suggest that game-based learning promotes critical thinking and learning in otherwise traditional classroom settings (Cicchino, 2015). Furthermore, applying communal game techniques where students collaborate to progress, have shown to develop various skills, including cooperative skills, digital literacy, and critical

thinking (Whitton, 2014, p. 167). Regarding higher learning, it seems plausible that a game-based approach can facilitate the development of critical thinking skills.

Games offer unique ways of exploring and playing with identities, and Gee (2007) asserts that all forms of active, critical, and deep learning is inextricably connected to identity in various ways. Therefore, the identity-development enabled by playing games can ultimately lead to deep learning. Learners bring several identities to various learning environments, and if learners' real-world identities as 'learners' in any context, i.e. 'learners of English' or 'learners of history', are already damaged, those identities must first be repaired to achieve active, critical learning. The same consequence applies if learners are not able or willing to bridge their various identities, or if they do not receive enough support from teachers to enable bridging the identities. Identity is thus at the root of higher-level learning. Video games are, according to Gee (2007), apt at helping repair damaged identities as well as offering needed support to bridge identities by encouraging learners to *try*, entice them to *put in lots of effort* and enable them to *achieve meaningful successes*. Therefore, games are not only suitable tools for learning through interplay of identities but can also function as imperative tools for repairing broken identities and support the bridging of identities essential for deep learning (Gee, 2007, p. 54-58).

4. The Potentials of Teaching With *Detroit: Become Human*

This chapter aims to illustrate how games might be fruitfully utilized in educational contexts by theoretically explore how the commercial-off-the-shelf title *Detroit: Become Human* (2018) may be implemented into the Norwegian upper secondary English classroom to facilitate various learning outcomes. First, *DBH* needs to be presented along with its critical reception, as a basic understanding of the game is necessary to understand how it might work in educational contexts. The critical reception of the game furthermore might influence the usability of the game in the classroom. Thereafter follows a discussion of what selection criteria teachers need to consider when implementing games in education, here exemplified by *DBH*. Lastly, *DBH* and a selection of its potential educational usages are explored.

4.1. *Detroit: Become Human*

4.1.1. At First Glance

Detroit: Become Human is a narrative video game "[w]ith a gargantuan 4,000-page script" (Holmes, 2018) that veer more into interactive film than traditional game. The story impressively morphs around players' decisions. Seemingly insignificant decisions can have major implications, and players are often "presented with four one-word reply options" that fundamentally determines the narrative, so called Quick-Time-Events (QTEs; Holmes, 2018). QTEs is a controversial method of play, "reducing actions to barely interactive sequences" (Stuart, 2017). Therefore, Hetfeld (2019) describes the game as a "moderately interactive adventure about androids developing […] consciousness" with a story that ambitiously sets "up a full-scale android revolution" through countless branching storylines, granting each player close to a unique experience (Hetfeld, 2019; Holmes, 2018; Reseigh-Lincoln, 2018). The wide range of possible outcomes is fundamental to the experience, and if a character dies, "the game carries on without them, the narrative hugely altered as a result" (Stuart, 2017). The importance of choices and consequences is nicely illustrated in the following quote:

> *"Not every […] choice leads to a drastically different story, but some will. Sometimes it might lead to the same result, but by a surprising new means. Sometimes it might change your relationship with another character and unlock a path that wasn't there before. Sometimes it might result in death, whether that be of a supporting [or main] character […], or a dramatic action sequence with unexpected consequences."*
> (O'Brien, 2018/20)

Players are limited to the scene they are currently playing, but how that scene plays out is entirely up to how players handle the task. Often, players must rely "on observation and forethought rather than response", as this game forces players to survey scenes and work out possibilities and dangers before making decisions (Stuart, 2017). The multitude of branching parts are made visible for the players at the end of each chapter, which gives the game a great replay value by entices players to revisit scenes to explore various scenarios (Hetfeld, 2019; O'Brien, 2018/20; Reseigh-Lincoln, 2018; Stuart, 2017).

DBH's cinematic achievements are among the best aspects of the game. Meticulous and detailed motion capture impressively translates the superb performances of the actors, giving them "ample opportunity to let their facial expressions do the talking" (Hetfeld, 2019). The levels within the game are arguably more impressive than film sets, and lighting makes this a highly atmospheric game where cameras are directed like in a movie, with different filming styles adapted to fit each of the main characters (Hetfeld, 2019; Holmes, 2018; O'Brien, 2018/20).

4.1.2. Setting and Story

DBH is set in 2038 Detroit, where "humans live alongside an oppressed android workforce" (Holmes, 2018). Society is transformed by technological advancements as human-looking artificial intelligence capable of passing the Turing Test enter every avenue of life. These *androids* "are so omnipresent that they're old news" and can be bought "in chain stores for the price of a discount mobile phone" (O'Brien, 2018/20). With the androids covering most menial tasks and dangerous jobs, the economy booms, but unemployment is skyrocketing. Humans bring constant injustices upon their artificial servants, causing the androids to develop their own consciousness. Fear and resentment grow as an increasing number of androids become *deviants* by exhibiting human-like awareness and free will, and start demanding rights. Additionally, with an ever-increasing population with longer lifespans, the environment irrevocably damaged, and Russia and America at the brink of war, the game inhabits a world very much on the tipping point (Hetfeld, 2019; Holmes, 2018; Reseigh-Lincoln, 2018; Stuart, 2017).

Players take charge of three different androids, Kara, Markus and Connor, switching between these protagonists and their independent, yet at times cross-hatching, narratives. Kara is a housekeeper working for an abusive owner, from which she rescues the daughter Alice. They become fugitives of the law, trying to escape to Canada as the human-android feud escalates. Markus is a carer working for an ailing artist who treats him more like a human

than a slave. He is falsely accused of harming his owner, eventually becoming the leader of an android rights movement. Connor is a brand-new, advanced investigation unit developed and programmed to help the police with the increasing number of cases involving *deviant* androids. Both Kara and Markus become deviants early in the game, which creates an interesting player-experience when Connor's job is to hunt down the two other playable characters (Frank, 2018; Hetfeld, 2019; Holmes, 2018; Quantic Dream, 2018; Reseigh-Lincoln, 2018).

4.1.3. Critical Reception

The critical reception of *Detroit: Become Human* (2018) has mainly been positive, though most reviews also describe reoccurring issues with aspects of the game. This indicates that game reviewers mostly agree on what the game does well and where it leaves room for improvement.

Metacritic.com collects reviews from respected critics to summarize critical entertainment reviews into a single Metascore out of 100 (About, Metacritic). For games, the Metascore is divided into five grades, illustrated in table below (Metascore, Metacritic).

General Meaning of Score	Games
Universal Acclaim	90 - 100
Generally Favorable Reviews	75 - 89
Mixed or Average Reviews	50 - 74
Generally Unfavorable Reviews	20 - 49
Overwhelming Dislike	0 - 19

DBH has two separate Metacritic pages, for both the PlayStation4 (PS4) and the PC version. Both scored within the generally favorable category, scoring 78 (PS4) and 80 (PC) respectively (PS4-DBH; PC-DBH, Metacritic). Metacritic also enables users to rate games and generate a separate user score out of 10. Interestingly, the user scores diverge more, with 8,7 for the PS4 version contrasted with only 7,4 for the PC version. (PS4-DBH; PC-DBH, Metacritic). Since the critics agree independent of the platforms (PS4 or PC), while users are heavily divided, this might indicate that gamers who prefer different platforms might have different game preferences.

Driven by its narrative, the story is both the strongest and the weakest aspect of *DBH*. The writing includes taboo topics rarely touched upon in the medium with various degrees of success and failure, which makes the game an inconsistent experience (Reseigh-Lincoln, 2018). "[I]ncapable of subtlety" (Hetfeld, 2019), it fails to challenge and reflect upon the ramifications of "prejudice, discrimination, social inequality and domestic abuse" (Frank, 2018). The game "imitates the surface of American anxiety, distrust and fear, without fully grasping its history, context and pain", reducing the severe subjects of androids' fight for humanity, struggles with discrimination and escaping abuse into "split-second button presses and polarized choices" (Frank, 2018). While Kara and Markus' storylines have received mixed critical acclaim, Connor's storyline is consistently considered good, embodying real heart. Being aggressively judged and distrusted by the humans he works with, Connor "subtly contends with the tensions of otherness" (Frank, 2018). Nevertheless, all three protagonists are dramatically interesting, the stakes are high and "[t]here [are] enough moments of quiet tenderness to keep [players] emotionally invested" (O'Brien, 2018/20).

4.2. Selection Criteria for Choosing Games for Learning

Kronenberg's (2012) criteria for selecting appropriate COTS video games for use in educational contexts closely correspond with and echo many of the findings from chapter three. This section therefore bases its discussion on Kronenberg's (2012) article, first presenting the criteria and then applying them to *DBH*.

4.2.1. Selecting Good and Appropriate Games for Educational Purposes

Most video games are not suitable for classroom settings. Therefore, teachers must manage to find, chose, and evaluate appropriate games to fit the curricula and enhance learning. However, most teachers are unfamiliar and inadequate with this process (Kronenberg, 2012, p. 53-54). Therefore, Kronenberg (2012) suggests nine selection criteria to guide educators in selecting appropriate entertainment games; 1. motivation and flow, 2. clearly defined and spaced goals, 3. game skills and game mechanics, 4. content, 5. story and narrative, 6. multimodality, 7. agency, 8. course integration and scaffolding, and 9. financial, technical, and administrative considerations (p. 55).

Motivation and learner attitudes are vital in education. Therefore, it is important to pick "a game that is rewarding and satisfying in itself", which users want to play simply to advance and unravel the mystery (Kronenberg, 2012, p. 56). Educators must ask themselves

whether pupils might enjoy playing this game regardless of extrinsic motivators. The tasks players must accomplish to advance in the game should "be manageable, clearly stated and broken down into smaller sub-tasks" to provide a feeling of progression as well as positive feedback, yet ought to be challenging enough to maintain interest and motivation (Kronenberg, 2012, p. 57). Both the interactivity level and the skill level required to advance in the game should be appropriate for the learner. Nevertheless, games' ability to save progress, pause and replay certain parts to try different approaches is crucial for learning with games, as learners might otherwise get frustrated and develop negative attitudes toward the game and ultimately the learning context (Kronenberg, 2012, p. 55-58). As a rule of thumb, if educators "cannot play the game, neither can the student be expected to" (Kronenberg, 2012, p. 58). Appropriate content constitutes a considerable issue in game selection for educational use. Some titles can immediately be dismissed due to "unsuitable displays of violence and eroticism" (Kronenberg, 2012, p. 59). However, not all such content needs to be unacceptable, just like not all violent content in literature is unacceptable. Educators must carefully review the content prior to implementing games. Content in entertainment titles is inherently authentic as these games are part of pupils' everyday life, providing learners with meaningful interactions and content that might provide more genuine interest, active engagement, and immersive learning environments. With games, two stories are at play: the high-level game-writer's story and the immediate-level player's story. The latter lets players experience *storyworlds* rather than *storylines*. Therefore, games, rather than deemed storytelling devices, can be considered devices of story-enabling. This distinction from other narratives is important to keep in mind when one integrates games into educational contexts (Kronenberg, 2012, p. 59-60). Some suggest that second-language teaching should focus on the multimodal aspects of games, as they expertly utilize various modes. This can assist student language proficiency through repetition of sequences, in-game information, and subtitles. A powerful criterion in video games is the perceived level of control of one's own actions, or *agency*. The personal immediate-level stories are important, which is why game's likelihood of facilitating compelling personal stories is vital for the selection of an entertainment title (Kronenberg, 2012, p. 61-62). Arguably the most challenging aspect of implementing entertainment titles is to adequately align the game with curriculum and intended learning outcomes, and certain learning outcomes might not benefit from use of video games. What constitutes an appropriate game depends on the setting, conditions, and intended learning goals. Nevertheless, "[t]he game as central object may only be […a minor] aspect of the learning process, leading to meaningful interaction, activities, and communication" (Kronenberg,

2012, p. 62). Educators may benefit from using games as a point of departure for other activities to enhance learning, such as writing narrative accounts of the immediate-level stories. Games thus need scaffolding to work but can simultaneously function as a scaffolding tool, and debriefing is important to turn the game experience into learning. Lastly, educators need to consider several non-diegetic factors, such as costs, whether students have access to the game, or whether the time and work needed justifies the learning potential (Kronenberg, 2012, p. 62-64). Additionally, one needs to keep in mind "[t]he rapid outdatedness and short shelf life of current titles" which "may lead to the inability to use the game in the future" (Kronenberg, 2012, p. 64).

4.2.2. Is *Detroit: Become Human* an Appropriate Choice?

Among other COTS games, Kronenberg (2012) analyses *Heavy Rain* (2010) in relation to the criteria, which like *DBH* is created by Quantic Dream. Both games are similar in terms of core mechanics and game-play, and thus comparable. Kronenberg (2012) describes the game as "an immersive, interactive film narrative played by a single player" (p. 67). Relating to the first two criteria, the author argues that the game is consumed like an interactive film where the users can influence the plot, which creates a motivating, engaging and immersive atmosphere. In contrast to many games, players cannot lose in a traditional sense when playing this game, as the story simply continues to unfold if a character dies. Relating to the third criterion, Kronenberg (2012) highlights the replayablility of the game, where chapters can be replayed several times to generate different outcomes. This, "allows less experienced gamers to play the game without getting too frustrated" (p. 68). In terms of content, story and narrative, the game has an ESBR rating 'Mature' which inhibits a widespread educational use of the title. Each player's individual story plays out differently as the plot moves on in various directions depending on user-choices, which might develop emotional involvement and personal attachment to the characters and story. The majority of time during game-play is spent listening, reading and watching the unfolding plot, which creates large amounts of multimodal and authentic language input. Furthermore, the game offers great sense of agency where the players feel in charge of the unfolding story, thus generating a feeling of personalization. Regarding criterion eight, Kronenberg (2012) points out that students may be used to mature content in other media, but due to "the otherwise so positive level of immersion and agency" (p. 69), the 'Mature' rating may not be feasible for educational use (p. 67-69). The game is therefore not suitable for most formal educational contexts, except perhaps in higher education with older students. The interactive and

compelling narrative of the game could be beneficially utilized in education, especially due to its structural mimicry of other narrative media such as films and novels. Technically speaking, the game is easy to manage, and inexpensive (Kronenberg, 2012, p. 67).

The fundamental game-play with quick-time-events, user-directed story development, and a cinematic narrative approach is identical in *Detroit: Become Human*. Therefore, much of the same can be said about that title. The content and story differ, but *DBH* also received 'Mature' ESRB rating. Additionally, the game is newer, which consequently renders even more realistic depictions. However, the nature of the mature content in *DBH* arguably differs from *Heavy Rain*. The violence depicted in the game is usually a result of players' choices and the ethical aspects of these actions are highlighted. Various NPCs often question or comment on the validity of players' violent choices, thereby creating an ethical awareness surrounding those decisions.

Concludingly, *DBH* can be a useful game for learning based on the selection criteria. It can motivate pupils and facilitate immersion through the experience of flow with its interactivity and user-driven story that engages players and help them identify with the characters and connect with the setting. Each chapter has a clear goal to achieve, usually with several sub-goals along the way, and are replayable, while the overarching story leaves enough mystery to unravel, which keeps players engaged and interested. The game mechanics are intuitive, and easy to comprehend and learn. Coupled with lower risk due to replayable chapters and absence of traditional 'game over' threat, the game may render inexperienced players less frustrated and thus less likely to develop negative associations with the learning environment. With player-actions impacting the story-development, *DBH* offers players unique and authentic multimodal game-experiences and immediate-level stories that become personal to the individual player who feels in control of the stories. As with all teaching materials, other activities should supplement game-play. Nevertheless, the game offers ample opportunities to connect with curricular issues in Norwegian upper secondary English education, and grants teachers with various possibilities to extend the game-world into other learning activities. The game is available for computers, which makes it technically accessible, nor is the game particularly expensive, especially if schools can utilize it in several subjects and over several years, which seems likely.

4.3. The Educational Potential of *Detroit: Become Human*

By connecting both general and specific aspects of *DBH* with Norwegian curricula presented in chapter two, as well as the theories and research discussed in chapter three, the thesis aims to illustrate how *DBH* can be utilized in educational contexts. First, the thesis addresses a few general aspects before exploring how a few selected game-chapters might be used in the classroom context to teach various curricular issues.

4.3.1. General Approach

Before using any learning material, the material should be clearly presented to the pupils along with information regarding what will be expected from them during the learning process and how using this material will help achieve the intended learning outcomes. This is especially important with game-based learning as pupils' expectations of the learning process (3.5.1) and perceptions of the appropriateness of fun and playing games for learning (3.6) is vital for the learning outcomes. Furthermore, it seems wise to use a commercial game like *DBH* over a longer period of time, since commercial games are usually time-consuming and necessitates hours of game-play for optimal effect (2.3). Pupils need time to master the game-play, explore and experiment with the game environment, content and narrative, and to develop attachment, identification and empathy towards the characters. In turn, this may enable greater immersive learning experiences (3.5).

Playing games must be accompanied by other supplementary activities and linked with intended learning outcomes. These supplementary activities may take any number of forms; be it written or oral; individual, pair, group, or plenary activities; and they may be smaller or larger in scope. Regardless of the form, the activities must closely connect to the game in some way to extend the game environment into the classroom environment and close the gap between game and classroom activities (2.3.2; 2.3.3; 3.2; 3.6). Such tasks could entail writing reviews or analyses of chapters from the game, playthrough descriptions, or exploring characters or topics through essays and fictional texts inspired by the game. Alternatively, pupils could explain, discuss, and reflect on why they chose certain options over others, or reflect on what could have happened if they had chosen differently. *DBH* has received some critique due to its lack of subtlety and failure to reflect upon the issues of prejudice, discrimination, social inequality, and domestic abuse (4.1.3.). However, in an educational context, teachers can utilize these clear parallels to history and contemporary societal issues by bridging the game events to real life events through supplementary activities. Furthermore, the immersive properties of video games may even strengthen the learning effect as pupils

who might not have felt much prejudice or discrimination can get a sense of how it feels to experience social injustices (3.5). In turn, this might leave a more lasting impression (3.3; 3.5).

When using *DBH* in a classroom setting, it might also be pertinent to pair pupils together. This way one pupil plays through a given chapter while the other takes notes. These roles should be switched with the chapters, so that both pupils experience approximately equal amounts of play-time and note-taking. Due to the numerous quick-time-events, one must always be in charge to make those split-second decisions. However, where possible, the pairs can still discuss and cooperatively determine what actions to take. Furthermore, pairing pupils could lessen the cognitive load for each pupil, and thus enhance learning (3.3; 3.4.2). Simultaneously, the note-taking should not be completely outside of the game experience, but rather be an extension of the game-world (2.3.2; 2.3.3; 3.2). This can also improve transfer of knowledge (2.3.2). With *DBH*, this could be done by formatting the note-taking to fit the player-characters. When playing as deviants Kara or Markus, the notes could for instance be written as diary-entries describing their experiences and contemplating the meaning of their newfound existences as beings with free will. With the detective-android Connor, the notes could be written as Connor's personal field notes or official reports. This connects the note-taking to the game-play, eases the transition from game environment to classroom setting and makes the note-taking more intrinsically valuable.

Customization of avatars help immersion and identification, and thus exploration of identity (3.5). The appearances of the playable *DBH*-characters are mostly fixed as they are designed to resemble the actors. Only Kara offers very limited customization. In one chapter, players may get the chance to change her clothes and hair. Nevertheless, with three distinct playable characters with their own unique stories that morph around player-choices in meaningful ways, *DBH* still offers plenty of possibilities to take on various roles and thus explore identities through meaningful choices, which in turn enables higher-level deep learning (3.7).

4.3.2. A Selection of Chapters

Once players have played through a chapter in *DBH*, they can see the many branching storylines they missed out on and may replay the chapter as often as they like. This benefits educational contexts as teachers may chose specific chapters to play through depending on intended curricular outcome rather than needing to play through the entire game. This section

will explore how a small selection of chapters may be used in the classroom for various learning outcomes.

The "Freedom March" chapter is arguably the most obvious to use in educational contexts. Markus, now leader of an android movement, assembles other deviants and leads them on a march through the main street. Eventually, armed police block their path, and players have several choices, most notably to disperse, charge or stand the ground. Regardless of choice, the police will open fire on the androids, and players are once more left with violent or non-violent choices. There are numerable different outcomes to this chapter, and all of them impact the public opinion of the android cause. If players chose a violent path, the population's fear of the androids increases, while a more peaceful approach leads to more sympathetic public opinions. This chapter is inspired by real historical events during the Civil Rights Movement (i.e. the Selma March), evident in one of the slogans players can choose while marching; "We have a dream" (Quantic Dream, 2018). Therefore, this chapter can help bridge the game-experience with teaching about the CRM. Furthermore, the scene also strongly reminisces of the Black Lives Matter marches that reignited after the death of George Floyd in 2020. Thus, this chapter can readily be utilized in the classroom through supplementary activities where teachers can connect both history and contemporary societal issues directly to the game-playing experience in numerable ways. The games' incorporation of public opinion can further be used to highlight the role of media and the importance of participation in democratic societies. Due to the many possible outcomes, it is impossible to say for certain, but it seems like Markus' personal story and the android movement achieves more positive outcomes from a more non-violent approach rather than a violent revolution. This too constitutes interesting grounds for classroom reflections. Additionally, it illustrates the curricular point that neither democracy nor civil rights should be taken for granted, but need to be maintained (Utdanningsdirektoratet, n.d.), preferably through peaceful democratic solutions.

Kara and Alice are on the run, trying to flee to Canada as the android situation deteriorates. Their story bares many resemblances with the situations of both illegal immigrants and refugees. During one chapter, a human takes them in and intends to help them cross the border, trying to hide them from the police. At some point a police officer arrives at the house and even encounters Kara. The player-actions determine whether the officer understands that Kara is a deviant or not. Furthermore, there are several possible ways in which Kara and Alice can cross the border, or fail to. One of the potential ways is by boat.

Crossing the river at night, they try to avoid the border patrols. In this chapter, players will however, always encounter the border patrol, and the player-actions determine whether both, none or either of Kara and Alice survive and arrive in Canada. Several chapters from Kara's storyline are thus apt to use in combination with other learning activities to teach about illegal immigration or refugees, both the dangers and to illustrate why some feel they have no other choice than to take the risk. This could form the basis of a discussion on ethics and moral.

Ethical awareness and the consequence of choices is prevalent in the game. In one chapter, Connor and his human partner Hank chase a deviant, taking alternating routes to cover more ground. Eventually they chase the deviant onto the roof of a tall building, where the deviant accidentally pushes Hank over the edge of the building. All that keeps Hank from falling to his death is his grip on the railing. As Connor, players have a split-second choice to make; save Hank and risk losing the suspect, or continue chasing the deviant, who is their only lead to solve the case. What makes the scene intriguing however, is an added element – Connor's android brain calculates the likelihood of Hank surviving without help. The survival rate is 89%, which begs the question: Is 89% survival chance enough to leave his fate entirely up to himself? At what survival chance will you chose to interfere and save Hank's life? Questions like these could be explored and discussed in a classroom setting.

Another chapter follows Markus breaking into a broadcast studio to record a televised speech. Unfortunately, an operator notices him and makes a run for it. Players can choose to do nothing and let the guard escape, possibly to sound the alarm, thus risking compromising the entire mission. Or they can choose to kill the guard, preventing the risk. If Markus kills the guard, his relationship with most of the other deviants accompanying him decreases, as does the public opinion of their cause. Once again, the game presents an ethical choice unlike many other games. In many adventure games, players have no problem killing an NPC that risks compromising the mission (3.5.3), but the way the choice is presented in *DBH* raises the ethical aspects of such actions.

Towards the end of Kara's story, players may arrive in time at a bus terminal to take the last bus crossing into Canada, and thereby safely escaping the US. However, Kara does not have a bus ticket. Luckily, she finds one on the ground which enables her and Alice to take the bus. Before players can enter the bus, however, a distraught family notice their ticket is missing and asks Kara if she has seen it. Players can choose to tell the truth and give back the bus ticket, or lie and keep it for themselves, thereby preventing the innocent family from

reaching Canada. Once again, players are confronted with a moral conundrum that requires ethical awareness which could be explored in the classroom.

Through exploration, players might pick up diegetic magazines in several chapters. The headline story of one such magazine announces the opening of a brand-new android zoo which will exhibit all species that, in the diegetic world, have become extinct during the last three decades, including polar bears and African elephants. These animals are not yet extinct in real life, but endangered. Therefore, teachers could use this fictional game-world as a place of departure for teaching environmental awareness, or to retrospectively connect environmental teaching to the learning experiences from playing this game.

5. Conclusion

This thesis set out to address the following questions:

- What does existing theories and research suggest one can learn from games in general, what are their potential learning effects?
- In light of existing theories and research, what can potentially be learnt by using *Detroit: Become Human* in educational contexts, and how could various learning outcomes be achieved through its use?

With a purely theoretical approach, this thesis has mainly presented and discussed theories and research regarding games and learning, before applying these to the game *Detroit: Become Human*. Chapter two offers a thorough rendition of the appropriate Norwegian curricula needed for this thesis and points out the challenges regarding the academic field of games and learning. Chapter three constitutes the main part of this thesis and discusses theories and research regarding several aspects relating to games and learning, namely motivation, multimodality, interactivity and feedback, immersion and identity, learning environment, importance of play, deep learning and critical thinking. Chapter four builds on chapter three and presents *DBH*, discusses its appropriateness for educational contexts, as well as outlines a few potential educational usages of the game.

5.1. Conclusion of Results

Based on the theories and research explored in this thesis it is undeniable that games can positively impact learning. However, there are many potential pitfalls teachers must be aware of and try to avoid. All games are different and will enable various possible learning outcomes. Many COTS games are not appropriate for educational use, but those that are, may offer greater learning potential than educational games, and even facilitate deep learning. The possible learning outcomes and the extent to which they are achieved will depend on several aspects. Firstly, what title is used will determine the learning potential. Selecting an appropriate game is therefore crucial. Furthermore, the educational intention the game is utilized for will further define what pupils may learn from the learning activities, as will teachers' ability to clarify how the use of the game enables pupils to achieve the intended learning outcomes. How game-based learning is perceived by both the teacher and the pupils, as well as how it is approached in the classroom, influences the possible impact the use of games has on learning. Additionally, all pupils learn differently, and despite the motivating

nature of games, not all pupils will benefit equally from all types of game-based teaching. As with all learning contexts, variables outside of game-playing also determine the efficiency of games for learning, as an unsafe learning environment and unclear goals always impact negatively on learning, as might the pressure of assessment. Games, however, may help facilitate safe learning environments where mistakes are natural part of the learning process and pupils become the authority of their game-playing experience. Learning from games in educational contexts needs extra-diegetic learning activities supplementing the game-playing experience, and teachers must find ways to bridge the game-playing with these other activities in meaningful ways. Bridging the game-playing experience with the other classroom activities is also crucial for learners to transfer learning and maximise games' ability to create experiential learning and facilitate identity-development through immersion and exploration. As with all teaching and learning activities, the value and efficiency of games and learning depends on innumerable factors, but games, like other accepted classroom activities, should be considered a valuable learning tool providing further variation and authentic learning experiences which helps bridge pupils out-of-school and in-school activities.

Highly interactive and immersive, *DBH* is an educationally versatile video game that provides teachers of older learners with many educational options. Its efficiency is ultimately at the mercy of the abovementioned factors at play, but given the right context, pupils can achieve various learning outcomes when using this title for learning in educational contexts. Like many games, *DBH* may offer multimodal, interactive and safe learning environments, exploration of identity, heightened motivation and immersion. Furthermore, *DBH* can be utilized to contribute to environmental teaching, learning about historical and contemporary societal issues, and the value of human rights, democracy, and citizenship, including the importance of participation, as well as ethical awareness.

5.2. Suggestions for Further Research

Due to the unfortunate circumstances regarding the pandemic, this thesis offers no original action-research, which future research should address. Compared to other pedagogies, limited research exists regarding video games and learning. Future research in the field should implement supplementary learning activities to amplify potential learning outcomes, and control groups using comparable methods, so that one can research how the use of video games compare to other more traditional teaching. Ideally, such research provides a bigger

sample, spans a longer time-period, and uses a mixed method approach (2.3). Despite proving challenging, researchers should furthermore aim to find ways in which to test and research long term, higher-level deep learning. This way, one might measure the long-term learning outcomes games theoretically facilitate, and one can research whether using games for learning can be better than alternative teaching approaches.

However, all games are different and may offer vastly different learning potentials. Therefore, research on games and learning will ultimately require varying research aims, methods and approaches depending on what title is used. Researchers could focus on any of the topics presented through the subchapters of chapter three in this thesis. It would, for instance, be interesting to see research on whether the immersive abilities of games can generate meaningful experiential learning situations and ethical awareness. Regardless, *Detroit: Become Human* may be an appropriate game to use for such research, at least if conducted on older learners.

6. Works Cited

Aaberg, L. (2020). *Beyond Gaming: Video Games in the Classroom* (Master Thesis). University of Agder, Kristiansand.

Cicchino, M. I. (2015). Using Game-based Learning to Foster Critical Thinking in Student Discourse. *Interdisciplinary Journal of Problem-Based Learning, 9* (2), Article 4. Doi: 10.7771/1541-5015.1481

Colby, R. S., & Colby, R. (2008). A Pedagogy of Play: Integrating Computer Games into the Writing Classroom. *Computers and Composition, 25* (3), 300-312. Doi: 10.1016/j.compcom.2008.04.005

Crookes, G., and Schmidt, R. W. (1991). Motivation: Reopening the Research Agenda. *Language Learning, 41* (4), 469-512. Doi: 10.1111/j.1467-1770.1991.tb00690.x

Darvasi, P. (2016). Gone Home and the apocalypse of high school English (C. Williams-Pierce, Ed.) In *Teacher pioneers: Visions from the edge of the map* (pp. 120-142). Pittsburgh, PA: Carnegie Mellon/ETC Press.

de Freitas, S., Rebolledo-Mendez, G., Liarokapis, F., Magoulas, G., & Poulovassilis, A. (2010). Learning as immersive experiences: Using the four-dimensional framework for designing and evaluating learning experiences in a virtual world. *British Journal of Educational Technology, 41* (1), 69-85. Doi: 10.1111/j.1467-8535.2009.01024.x

deHaan, J., Reed, W.M., & Kuwada, K. (2010). The Effect of Interactivity with a Music Video Game on Second Language Vocabulary Recall. *Language Learning & Technology, 14* (2), 74-94.

Dolby, N. & Rahatzad, J. (2018). Experiential Learning in Teacher Education: Increasing Awareness of Diversity Through the Immersion Experience. *ELTHE: A Journal for Engaged Educators, 2* (1), 7-25.

Egenfeldt-Nielsen, S. (2006) Overview of research on the educational use of video games.

Nordic Journal of Digital Literacy, 1(3), 184-213. Retrieved from https://www.idunn.no/dk/2006/03/overview_of_research_on_the_educationaluseof_video_games

Frank, A. (2018, 25.05.). Detroit: Become Human tackles civil rights without a grasp of history. *Polygon*. Retrieved from https://www.polygon.com/2018/5/25/17391878/detroit-become-human-review-ps4

Gee, J. P. (2006). Why Game Studies Now? Video Games: A New Art Form. *Games and Culture, 1*(1), 58-61. Doi: 10.1177/1555412005281788

Gee, J. P. (2007). *What Video Games Have to Teach Us About Learning and Literacy* (trade paperback, 2. Ed.). New York: St. Martin's Griffin.

Green, M. C., & Jenkins, K. M. (2014). Interactive Narratives: Processes and Outcomes in User-Directed Stories. *Journal of Communication, 64*, 479-500. Doi: 10.1111/jcom.12093

Guichon, N., & McLornan, S. (2008). The effects of multimodality on L2 learners: Implications for CALL resource design. *System, 36* (1), 85-93. Doi: 10.1016/j.system.2007.11.005

Henry, A. (2013). Digital Games and ELT: Bridging the Authenticity Gap (E. Ushioda, Ed.). *International Perspectives on Motivation*, 133-155. Doi: 10.1057/9781137000873_8

Henry, A., Sunqvist, P., & Thorsen, C. (2019). *Motivational Practice: Insights from the Classroom*. Lund: Studentlitteratur AB.

Hetfeld, M. (2019, 17.12.). Detroit: Become Human Review. *PC Gamer*. Retrieved from https://www.pcgamer.com/detroit-become-human-review/

Holmes, O. (2018, 24.05.). Detroit: Become Human review – meticulous multiverse of interactive fiction. *The Guardian*. Retrieved from https://www.theguardian.com/games/2018/may/24/detroit-become-human-review

Kang, B., and Tan, S. H. (2014). Interactive Games: Intrinsic and Extrinsic Motivation,

Achievement, and Satisfaction. *Journal of Management and Strategy, 5* (4), 110-116. Doi: 10.5430/jms.v5n4p110

Kelentric, M., Helland, K., & Arstorp, A. (2017). *Professional Digital Competence Framework for Teachers* (Rep.). Senter for IKT i utdanningen. Retrieved from https://www.udir.no/in-english/professional-digital-competence-framework-for-teachers/

Killin, A. (2017). Discussion: Video Games and Imaginative Identification. *The Journal of Aesthetic and Art Criticism, 75* (2), 181-187).

Krashen, S. D. (1982). *Principles and Practices in Second Language Acquisition* [2009 Internet edition]. Pergamon Press Inc. Retrieved from http://sdkrashen.com/

Kronenberg, F. A. (2012). Selection Criteria for Commercial Off-The-Shelf (COTS) Video Games for Language Learning. *The IALLT Journal of Language Learning Technologies, 42* (2), 52-78. Doi: 10.17161/iallt.v42i2.8512

Lauer, C. (2009). Contending with Terms: "Multimodal" and "Multimedia" in the Academic and Public Spheres. *Computers and Composition, 26* (4), 225-239. Doi: 10.1016/j.compcom.2009.09.001

Mayer, R. E., & Moreno, R. (1998). A Split-Attention Effect in Multimedia Learning: Evidence for Dual Processing Systems in Working Memory. *Journal of Educational Psychology, 90* (2), 312-320. Doi: 10.1037/0022-0663.90.2.312

Medietilsynet. (n.d.) Beskyttelse av barn mot skadelig innhold I film, tv og dataspill. Retrieved from https://www.medietilsynet.no/barn-og-medier/aldersgrenser/#anchor_22

Metacritic. (n.d.). Detroit: Become Human (PC). Retrieved from https://www.metacritic.com/game/pc/detroit-become-human

Metacritic. (n.d.). Detroit: Become Human (PlayStation 4/PS4). Retrieved from https://www.metacritic.com/game/playstation-4/detroit-become-human

Metacritic. (n.d.). Here's How We Help You Find Stuff You'll Love (About). Retrieved from https://www.metacritic.com/about-metacritic

Metacritic. (n.d.). How We Create the Metascore Magic (Metascore). Retrieved from https://www.metacritic.com/about-metascores

Moreno, R., & Mayer, R. (2007). Interactive Multimodal Learning Environments: Special Issue on Interactive Learning Environments: Contemporary Issues and Trends. *Educational Psychology Review*, *19*, 309-326. Doi: 10.1007/s10648-007-9047-2

Multimodality. (n.d.). *Oxford Reference*. Retrieved 24.02.21 from https://www.oxfordreference.com/view/10.1093/oi/authority.20110810105437336

Natkin, S. (2010). Interactivity in Games: The Player's Engagement. In R. Nakatsu, N. Tosa, F. Naghdy, K. W. Wong, & P. Codognet (Eds.), *Cultural Computing* (pp. 160-168). Berlin: Springer.

O'Brien, L. (2020, 21.04.). Detroit: Become Human Review. *IGN*. Retrieved from https://nordic.ign.com/detroit-become-human/15304/review/detroit-become-human-review

Olsson, E. (2012). *"Everything I read on the Internet is in English". On the impact of extramural English on Swedish 16-year-old pupils' writing proficiency*. (Rep. No. 15). Göteborgs Universitet. Retrieved from https://gupea.ub.gu.se/handle/2077/30417

Prensky, M. (2006). *Dont bother mer, Mom, I'm learning!: How computer and video games are preparing your kids for the 21st century success adn how you can help!* St.Paul, MN: Paragon House.

Quantic Dream & Sony Interactive Entertainment America LLC. (2018). *Detroit: Become Human*.

Reseigh-Lincoln, D. (2018, 29.05.). Detroit Become Human review: brilliant and flawed. *TechRadar*. Retrieved from https://www.techradar.com/news/detroit-become-human-review-brilliant-and-flawed

Rasmussen, R. H. (2017, 30.11). Dette må du vite om aldersgrenser. Retrieved from https://www.barnevakten.no/aldersgrenser/

Rativa, A. S., Postma, M., & Van Zaanen, M. (2020). The Influence of Game Character Appearacne on Empathy and Immersion: Virtual Non-Robotic Versus Robotic Animals. *Simulation & Gaming, 51* (5), 685-711. Doi: 10.1177/1046878120926694

Ritterfeld, U., Shen, C., Wang, H., Nocera, L., & Wong, W. L. (2009). Multimodality and interactivity: connecting properties of serious games with educational outcomes. *CyberPsychology & Behavior, 12* (6), 691-697. Doi: 10.1089/cpb.2009.0099

Robson, J. & Meskin, A. (2016). Video Games as Self-Involving Interactive Fictions. *The Journal of Aesthetic and Art Criticism, 74* (2), 165-177. Retrieved from https://www.jstor.org/stable/44510494

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology, 25*, 54-67. Doi: 10.1006/ceps.1999.1020

Sancho, P., Moreno-Ger, P., Fuentes-Fernandez, R., & Fernandez-Manjon, B. (2009). Adaptive Role Playing Games: An Immersive Approach for Problem based Learning. *Educational Technology & Society, 12* (4), 110-124.

Sankey, M. D., Birch, D., & Gardiner, M. W. (2011). The impact of multiple representations of content using multimedia on learning outcomes across learning styles and modal preferences. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 7* (3), 18-35.

Schroeder, N. L. & Cenkci, A. T. (2018). Spatial Contiguity and Spatial Split-Attention Effects in Multimedia Learning Environments: a Meta-Analysis. *Educational Psychology Review, 30*, 679-701. Doi: 10.1007/s10648-018-9435-9

Smuts, A. (2009). What Is Interactivity? *The Journal of Aesthetic Education, 43* (4), 53-73. Doi: 10.1353/jae.0.0062

Squire, K. (2005). Changing the Game: What Happens When Video Games Enter the

Classroom. *Innovate: Journal of Online Education*, *1*(6), Article 5. Retrieved from https://nsuworks.nova.edu/innovate/vol1/iss6/5/

Steam. (n.d.) Detroit: Become Human. Retrieved from https://store.steampowered.com/app/1222140/Detroit_Become_Human/

Stuart, K. (2017, 15.06.). Detroit: Become Human – what happens if the androids hate us? *The Guardian*. Retrieved from https://www.theguardian.com/technology/2017/jun/15/detroit-become-human-quantic-dreams-narrative-video-game-what-happens-if-the-androids-hate-us

Sundqvist, P., & Olin-Scheller, C. (2013). Classroom vs. Extramural English: Teachers Dealing with Demotivation. *Language and Linguistics Compass*, *7*(6), 329-338.

Tüzun, H., Yilmaz-Soylu, M., Karakus, T., Inal, Y., & Kizilkaya, G. (2009). The effects of computer games on primary school students' achievement and motivation in geography learning. *Computers and Education*, *52*, 68-77. Doi: 10.1016/j.compedu.2008.06.008

Utdanningsdirektoratet. (n.d.). *Core Curriuculum – values and principles for primary and secondary education*. Retrieved 04.02.21 from https://www.udir.no/lk20/overordnet-del/?lang=eng

Utdanningsdirektoratet. (2020a). *Curriuculum in English* (ENG01-04). Retrieved 04.02.21 from https://www.udir.no/lk20/eng01-04?lang=eng

Utdanningsdirektoratet. (2020b). *Læreplan i Engelsk* (ENG01-04). Retrieved 04.02.21 from https://www.udir.no/lk20/eng01-04?lang=nob

Utdanningsdirektoratet. (2021/2022). *Læreplan i engelsk programfag* (ENG04-02). Retrieved 05.02.21 from https://www.udir.no/lk20/eng04-02

Van Eck, R. (2007). Six ideas in search of a discipline. In B.E. Shelton & D. Wiley (Eds). *The design and use of simulation computer games in education* (pp. 31-60). Rotterdam: Sense Publishers.

Van Eck, R. (2009). A Guide to Integrating COTS Games into Your Classroom (pp. 1-21). In R. Ferdig (Ed.), *Handbook of Research on Effective Electronic Gaming Education* (pp. 179-199). Hershey, PA: Idea Group. Doi: 10.4018/978-1-59904-808-6.ch011

van t' Riet, J., Meeuwes, A., van der Voorden, L., and Jansz, J. (2018). Investigating the Effects of a Persuasive Digital Game on Immersion, Identification, and Willingness to Help. *Basic and Applied Social Psychology, 40* (4), 180-194. Doi: 10.1080/01973533.2018.1459301

Weber, R., Behr, K.-M., & DeMartino, C. (2014). Measuring Interactivity in Video Games. *Communication Methods and Measures, 8* (2), 79-115. Doi: 10.1080/19312458.2013.873778

Whitton, N. J. (2007). *An investigation into the potential of collaborative computer-based learning in Higher Education* (Ph.d. thesis). Edinburgh Napier University. Retrieved from https://www.napier.ac.uk/research-and-innovation/research-search/outputs/an-investigation-into-the-potential-of-collaborative-computer-game-based-learning-in

Whitton, N. (2014). *Digital Games and Learning: Research and Theory*. New York: Routledge.

Yang, Y.-T. C., & Wu, W.-C. I. (2011). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education, 59,* 339-352. Doi: 10.1916/j.compedu.2011.12.012