A Dialogic Approach to Game-Based Learning

The Role of the Teacher in Students' Engagement with Ethics and Morality in Citizenship Education Using a Commercial Off-the-Shelf Videogame

Filipa Ferreira Dinis Monteiro de Sousa

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Acknowledgments

Since 1996, I have engaged in studying, coordinating, developing and implementing global education projects during my career as a psychologist. I am interested in the bridge between formal and informal education and the inclusion of out-of-school narratives, such as traditional stories, myths and fairytales, in educational school practices. I have developed several projects that explore how the dialogic space mediated by cultural tools such as traditional book stories could lead to interesting collaborative experiences both psychologically and educationally. I am especially interested in the use of those cultural tools for opening dialogic spaces to address emotional and moral issues within school contexts.

I have also developed a keen interest in education through dialogue from my involvement in projects such as "Philosophy for Children" and "First Look," which considered the use of dialogue to approach art in gallery and museum contexts. These same interests brought me to the research project presented in this dissertation. My research project focuses on videogames as modern narratives for the 21st century and on the recent interest in technology-enhanced educational settings, particularly game-based learning. As a psychologist, I am interested in exploring the potential of these new forms of narrative to elicit moral and ethical reflection, as an extension of what is commonly attributed to traditional myths and fairytales. Taking a sociocultural and dialogic approach to investigating the educational use of such technologies followed naturally from my previous work.

When I moved from Portugal to Norway, I was surprised by the extensive use of technology in the Norwegian education system, and I soon became fascinated with dialogic pedagogies as a base line for teaching in Norway. The opportunity to work in a research group that investigates the combination of both technology and dialogic pedagogies was a once-in-a-lifetime opportunity. When, at our first meeting, I presented my idea of studying the development of social skills in relation to the use of videogames, I asked Palmyre Pierroux if she thought the research group would consider the topic relevant. Her reaction was "Of course we do!" Years later I can understand why: twin minds think alike.

I am lucky to have become part of such a milieu, and I would like to express my appreciation to all my colleagues for having contributed to my project and personal growth. Among these people I hold special admiration for Svitlana Kucherenko—the most wonderful and inspiring friend, and an intellectual and spiritual soulmate, who helped me to keep sane during the process and believe in myself as much as I believe in her—and for Sven Magne Bakken, for all the interesting joint wondering.

I would like to dedicate a very special word to my supervisors. They are the most inspirational wellsprings I could have found. Professionally, I thank Ingvill Rasmussen for being such a solid researcher with so much to teach. Thank you for pointing me in the right direction whenever necessary and for always providing space for my "self" to be. I have learned a tremendous amount from you. I would also like to thank Palmyre Pierroux for being a strong source of theoretical support and for always keeping me thinking outside the box. Thank you for never letting me lose focus on what this project is all about. On a personal note, I would like to pay tribute to these two wonderful human beings: Palmyre for being there for me ever since I wrote the first word, and Ingvill for never letting me down and for teaching me that "perfection is elsewhere". I am incredibly grateful to you both.

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To my family, I can only say that being 3,500 kilometers apart from you during this period was always hard, but I feel you were never really that far away. My mom's daily support, Viber, Facetime and my daughters' YouTube sharings were also a great part of me getting to this point. I would like to acknowledge my gratitude to technology for enabling all these life-saving narratives. My father, Ricardo, did not survive to see how I proudly "fooled them all," but he did leave me my curiosity and my great thirst for knowledge. I thank him for all the times I hold to the thought that I am still my father's daughter. To my mom, Inês, I thank you for the infinite patience and for inspiring me to be the very best human being I can be: you know that "I'm everything I am because you loved me." To my grandparents, Miú and Xiquito, I thank you for all the inspirational resilience lessons you've taught me. You surely helped me in difficult times and in dealing with "what they have done to my song." To my daughters, Íris and Madalena, I dedicate this thesis and all my love—because I want to construct a better world for you. And, mainly, because you deserve it. *Puella* and *Laetitia*, two stars greater than my whole universe, "Once upon a time there was a perfect world (…) you know I'd paint the sky … and we laughed before, and loved before, but who knows where or when?" I will always be here.

Filipa de Sousa, April 2021

Table of Contents

PART I: EXTENDED ABSTRACT

PART II—THE ARTICLES

Article I: de Sousa, F. (2019). Game-based learning in the dialogic classroom: Videogames for collaborative reasoning about morality and ethics in citizenship education. In H. C. Arnseth, T. Hanghøj. T. D. Henriksen, M. Misfeldt, R. Ramberg and S. Selander (Eds.), *Games and education: Designs in and for learning* (pp. 47-65). Brill|Sense Publishers. https://doi-org.ezproxy.uio.no/10.1163/9789004388826_004

Article II: de Sousa, F., Rasmussen, I. & Pierroux, P. (2018). Zombies and ethical theories: Exploring transformational play as a framework for teaching with videogames. *Learning, Culture and Social Interaction 19*, 40-50. https://doi.org/10.1016/j.lcsi.2018.04.011

Article III: de Sousa, F. & Rasmussen, I. (2019). Productive disciplinary engagement and videogames: Teacher educational design for engaging students in ethical theories in citizenship education. *Nordic Journal of Digital Literacy, 3-4*(14), 99-116. https://doi.org/10.18261/issn.1891-943x-2019-03-04-02

1. Introduction

Since the turn of this century, much has been said about the need for new educational models and technologies to meet the demands of the times. If schools intend to maintain their central importance in contributing to citizens' development in the 21st century, they cannot overlook the increasingly central place that technologies and digital media occupy in the out-of-school life of young people and their role in cultural and identity formation. Citizens in general, and students in particular, are part of a society in which new communication and social paradigms emerge every day. Technology use is therefore a top priority when describing competences and skills needed for the 21st century (Erstad, 2013). While learning is happening, not only inside the classroom but across all contexts (Hull, 2012 as cited in Cheuk, 2012), our role as researchers is to acknowledge and explore the direct and indirect implications of these new learning vectors.

Videogames are among the technologies used to create more engaging educational environments for 21st century students. Although still controversial with respect to results, in the last two decades researchers have pointed to the educational potential of these tools, which combine thinking, technology and social interaction in learning activities (Shaffer, 2006). This research field, generally called game-based learning (GBL), has grown significantly in the last decade and has produced much empirical research.

The term GBL has been defined in different ways. Some definitions describe GBL simply as a type of gameplay that leads to learning (EdTechReview, 2013). However, accidentally learning while playing games differs from educational efforts that target the use of games with specific learning goals. This intentionality and the formal school setting define the GBL experience within the scope of this thesis. In this thesis I acknowledge the term GBL as problematic because it assumes that some type of learning outcome has directly resulted from the game activity when other aspects may actually have been involved (Ludvigsen, Cress, Law, Rosé & Stahl, 2016), such as students' previous experience and knowledge. This study does not use the term GBL to refer to learning outcomes but rather classroom activities where videogames are intentionally used as learning resources. In other words, GBL is seen as a broader teaching experience that incorporates not only the act of playing but also the teacher's role and dialogic approaches.

This thesis involves a particular emphasis on the ways in which videogames (sometimes simply called games) can be formally used in schools, specifically in the disciplinary field of citizenship education (CE) and learning about ethics and morality. While this study does not focus on the activity of playing games in the classroom per se, it does focus on understanding how the integration of a commercial off-the-shelf (COTS) roleplay videogame as an educational resource has contributed to collaborative reasoning in terms of ethics and morality. Some researchers have pointed out that some COTS videogames are embedded with ethical frames that allow opportunities for moral and ethical reasoning, and they do so in ways that may foster civic and moral skills (Simkins & Steinkuehler, 2008; Zagal, 2009; Sicart, 2010, 2013). As regards the educational use of videogames, some teachers have started to integrate COTS

videogames into their teaching of academic curricula. However, the inclusion of commercial, non-educational and sometimes violent videogames in schools is still controversial.

This thesis develops an exploratory study, taking a GBL case in the disciplinary field of CE as a context to empirically clarify the educational aspects that underlie the design of GBL using a COTS videogame. The study analyzes the way the videogame was integrated into a dialogic practice to create a whole GBL experience. The intention is not to contribute to the didactics of teaching in CE but rather to study the use of dialogic approaches with GBL in an educational context and explore how gameplay has served as a window for open dialogue and discussion about ethics and morals. The study is in line with the proposal that any tool's educational value will depend on the context of its use. It explores a learning situation where traditional teaching resources are combined with new technologies, namely how a videogame has been integrated into teaching practices and used as a mediational tool for learning. Learning, in this thesis, is not simply perceived as a matter of gaining factual knowledge but rather as changing participation. With the sociocultural and dialogic theoretical approach this study uses, learning is a matter of how students progressively master and appropriate mediational means and how they learn to use these tools in specific domains. Put another way, this study examines how students learn to use videogames and class discourse as cultural tools to express meaning and intentionality while making sense of curricular ethical theories.

Because GBL is a new and emergent field, little is known about how teachers may enact educational designs that make use of videogames in class or how effective those methods actually are (Linderoth, 2012). This exploratory study contributes to that debate, empirically clarifying the aspects that underlie the educational design of GBL. In the study, the concept of design refers to the way the teacher planned and conceived the GBL activities as well as the way he/she enacted its implementation (Lund & Hauge, 2011). The aim is to provide a context for the understanding of GBL that can help guide teachers during such work, namely in the area of CE.

The European Parliament and the Council of the European Union (2006) have described social and civic competencies as being part of the key competencies for lifelong learning: "to participate in an effective and constructive way in social and working life (…) to resolve conflict where necessary (…) for successful interpersonal and social participation (…) to understand the codes of conduct and manners generally accepted in different societies and environments" (p. 7). Using a sociocultural and dialogic approach in this thesis, I argue that all these competences ultimately start with learning to dialogically participate in social environments. CE in school overlaps and cuts across the fields of moral, character-related and civic education (Althof & Berkovitz, 2006), but the present research focuses on the particular aspect of reasoning about morals and ethics. *Morals* are concerned with the subject's concrete actions, while the term *ethics* refers to the philosophical reflections that justify the moral action (Rauche, 2000). This thesis seeks to study whether and how GBL may contribute to these competences—an empirical question requiring study.

1.1 Research aims

The study's primary aim is to contribute to knowledge within the field about the *design and implementation of dialogic teaching practices using commercial videogames to learn about citizenship, ethics and morals*. This aim relates to the need to gain knowledge about designing new educational learning experiences that will align with 21st century students' interests. To pursue this aim, this study explores GBL by focusing on the teacher's enacted design and the integration of different learning resources (see Rasmussen & Ludvigsen, 2010; Hanghøj, 2013). The study has two specific objectives:

- To gain knowledge about how videogames and other educational resources are used as mediational tools for promotion of meaning-making in the classroom and across contexts. This objective addresses the lack of empirical studies of the learning processes that underlie the integration of COTS games in school contexts. The study examines which cultural resources are invoked and how students and teachers learn to use these resources to work on the curricular content; the use of these resources in view of dialogic framings of GBL is of particular interest.

- This leads to the second objective, which is to contribute knowledge about how learning is co-constructed in dialogues that bring together a multiplicity of voices as collaborative reasoning processes unfold throughout a GBL situation.

To pursue these objectives, research questions with different aims were posed and explored in three different articles, as follows:

- Article I: de Sousa, F. (2019). Game-based learning in the dialogic classroom: Videogames for collaborative reasoning about morality and ethics in citizenship education. In H. C. Arnseth, T. Hanghøj. T. D. Henriksen, M. Misfeldt, R. Ramberg and S. Selander (Eds.), *Games and education: Designs in and for learning* (pp. 47-65). Brill|Sense Publishers. https://doi-org.ezproxy.uio.no/10.1163/9789004388826_004

- Article II: de Sousa, F., Rasmussen, I. & Pierroux, P. (2018). Zombies and ethical theories: Exploring transformational play as a framework for teaching with videogames. *Learning, Culture and Social Interaction 19,* 40-50. https://doi.org/10.1016/j.lcsi.2018.04.011

- Article III: de Sousa, F. & Rasmussen, I. (2019). Productive disciplinary engagement and videogames: Teacher educational design for engaging students in ethical theories in citizenship education. *Nordic Journal of Digital Literacy, 3-4*(14), 99-116. https://doi.org/10.18261/issn.1891-943x-2019-03-04-02

  [nominated by the Nordic Journal of Digital Literacy for the "article of the year" award by the publisher Universitetsforlaget]

In these three articles, I tried to uncover the collaborative reasoning processes underlying the class dialogues (Article I), clarify how different teachers have developed dialogic approaches to GBL to facilitate learning experiences (Article II) and understand how the integration of different mediational resources in GBL activities has engaged students in disciplinary discussions that have culminated in a productive learning trajectory (Article III). This extended abstract discusses findings described in the three articles. Fig. 1 represents the interests of the research project, in relation to the written articles.

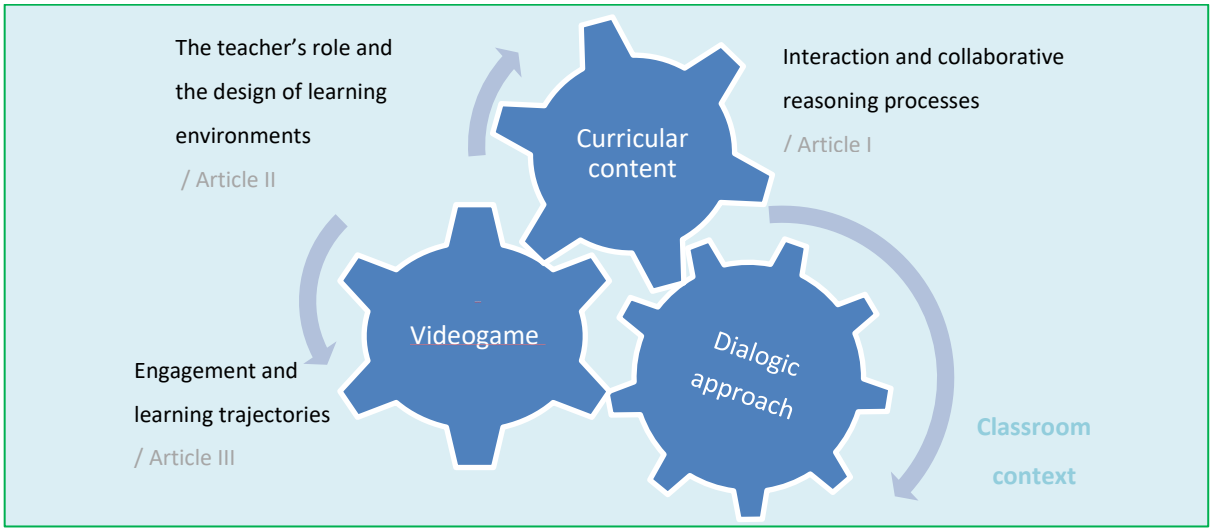


Fig. 1. Interests of the research project.

The research design addresses a broad research question: How do GBL educational designs for learning ethical theories mediate students' collaborative thinking and meaning-making? The study characterizes the learning trajectory and reveals the processes of engagement and meaning-making, with a focus on students' collaborative reasoning and the teachers' enacted designs.

1.2. Empirical cases in this thesis

To pursue the aforementioned aims, the research design includes studies of the use of a COTS videogame in ethics lessons. A brief presentation of these studies is presented here, and the detailed methodological aspects are described in Chapter 4. Because videogames are a common practice among young people across the developed world, the research design allowed for the study of a similar GBL practice in two secondary-school classrooms in citizenship courses in two countries, Portugal and Norway. Although the study was not intended to be comparative, the data corpus was nonetheless enriched by extending the studies across different cultural and educational settings.

Attempts to define what constitutes a videogame (e.g., Salen & Zimmerman, 2004; Esposito, 2005) often refer to a fictional, unpredictable and unproductive activity that is dominated by rules, time and space limitations, and is voluntary, fun and stimulating (Griffiths, 2002). Moreover, researchers have yet to reach a consensus on how to categorize different types of videogames (see Newman, 2004; Apperley, 2006). While acknowledging the diversity of videogame types, and also recognizing their differentiated potential as mediational tools for

learning, this study's empirical scope is limited to a particular videogame *The Walking Dead* (henceforth *TWD*).

The two settings, in Portugal and Norway, comprise the case studies for the thesis. The classes in the two countries were followed during a similar activity by using *TWD* to learn a content unit about morals and ethics (Portuguese Ministry of Education, 2004; Norwegian Directorate for Education and Training, 2006). The teacher introduced the class to theoretical concepts in ethics. The class collaboratively played the game, with one of the students holding the remote control to control the game and the others following the action on a big screen. At five critical moments, when choices included moral dilemmas, the teacher asked the students to pause the game before the class made a decision. These decisions often present moral dilemmas, which the teachers used as opportunities to lead class discussions about the dilemmas in terms of the ethical theories found in the school curricula, using whole-class and small-group discussions. The teacher then asked the students, using an app they had logged onto through their mobile devices or computers, to individually vote on which actions the game characters should take. They were presented with four possible options that considered several game outcomes. The options not only included decisions about the course of action but also pointed to different reasons for making that particular choice. After the students voted, the results appeared on the screen as graphics, and the number of votes was visible for each option. The player with the remote control then selected the winning option, and gameplay continued. This GBL activity was an ongoing practice created by a Norwegian teacher (Staaby, 2015; Staaby 2020; see also Klevjer, Staaby & Husøy, 2015), and the researcher later introduced the practice to a Portuguese teacher, who adapted the practice to the Portuguese context. The design of the pedagogical practice using a videogame to fit the subject goals required a great deal of creativity from the Norwegian teacher. The *TWD* game also had adaptable characteristics that may not exist in many other COTS games. *TWD* was chosen because it offers an open narrative in which the players' decisions affect the game story (see Fig. 2).

Fig. 2. Illustration of a game dilemma in TWD, where the player must choose whether to try to save a man or a boy, both of whom are simultaneously attacked by zombies.

1.3. Outline of the thesis

Chapter 1 presents the research project by situating the study within the research field, contextualizing its background and explaining its relevance. It also briefly presents the empirical studies, the research questions and the overall aims and objectives of the thesis. Chapter 2 presents the theoretical approaches that served as a lens for collecting and analyzing the data, namely a sociocultural perspective and a dialogic approach to learning, as well as theoretical perspectives of learning through play and engagement. Chapter 3 presents the literature review, addressing GBL studies and dialogic education. It presents discussions about the moral impact of playing videogames and describes GBL as a research field. It also addresses the challenge of using videogames in the classroom. Later, the chapter reviews previous studies of the design of dialogic learning environments and presents key studies that, similarly to this one, zoom in on various dialogic processes by analyzing how teachers and students engage with learning practices in educationally designed GBL environments. Chapter 4 provides methodological details about the design and implementation of the project. It describes the various empirical settings, including the participants, the classes, the teachers, the resources that were included and the activities that were implemented. Details are provided here on how data were collected, organized and analyzed. Reliability and validity are both considered in this chapter, in view of the affordances and limitations of the study. Further, I address how ethical issues were treated throughout the implementation of the project. Chapter 5 presents a summary of each of the three written articles, while Chapter 6 discusses their key findings in relation to previous empirical research and stances from different theoretical fields. Chapter 6 also summarizes the project's theoretical and empirical contributions and presents the pedagogical implications of this study for designing GBL.

This extended abstract comprises the first part of the thesis. The second part of the thesis includes complete versions of my three published articles, which appear chronologically, in accordance with my work during my PhD studies.

2. Theoretical framework

This dissertation builds on a theoretical stance grounded in a sociocultural perspective (Vygotsky, 1978, 2016) and a dialogic approach to learning (Bakhtin, 1981, 1986). The two perspectives equally inform this study by framing GBL as an interpersonal event in which meaning-making is collaboratively constructed through dialogic processes. Here follows a brief discussion of central concepts in the sociocultural tradition relevant to this thesis.

2.1. Learning in the sociocultural tradition – central concepts

The present thesis investigates meaning-making in classroom dialogues by taking a sociocultural perspective based on the seminal contributions of Leo Vygotsky and the reconfigured ideas from the neo-Vygotskyan tradition (e.g., Wertsch, 1991, 1998, 2007).

In this study, ***meaning-making*** refers to the process of knowledge building in socially situated practices. The sociocultural perspective on meaning-making attributes this construction to an ecology of distributed actors and resources that occurs between a group of individuals and artifacts (Vygotsky, 1978). As such, meaning-making is understood as a sociocultural process of participation, which is intersubjective, because it depends on participants' attention to each other's understandings while learning (Rommetveit, 1992). Under this theoretical lens, learning has an interactional basis and occurs within broad social and cultural contexts while people participate in socially constituted practices. Every human action is mediated with semiotic signs and tools (Vygotsky, 1978), and language is the crucial mediational tool because it offers a semiotic system that works as a basis for the human intellect (Wertsch, 1991). As mentioned before, learning is perceived not simply as gaining factual knowledge but as changing participation. It is a matter of how students progressively master and appropriate mediational means and learn to use these tools in specific domains. Wertsch (1998) distinguishes between the mastery of conceptual information and the personal appropriation of knowledge. ***Mastery,*** which refers to the gradual process of learning to use a cultural tool for specific purposes, involves consciously knowing how to apply a particular concept in a particular context (Wertsch, 1998). ***Appropriation***, which requires borrowing something from others and investing it with one's own intentions, involves a sense of ownership and implies that a concept, or cultural tool, is appropriated in ways that relate to the learner (Wertsch, 1998). Appropriation and mastery are not simply extrapolated from one context to another (Wertsch, 1998; Polman, 2006). Most tools and artifacts have a cultural inheritance connected to the context in which they are used. Of particular interest for the current study is the claim that physical and psychological mediational resources (Vygotsky 2016), used in classroom interactions, mirror the historical and social processes that have been established over the years (Säljö, 1998). The present research contemplates the importance of considering the circumstances in which meaning is created, since in classrooms learning is situated in specific institutional and cultural contexts involving historically accumulated meanings and knowledge (Wertsch. 1998; Pierroux, 2010). The present study investigates the use of a COTS videogame in a formal educational setting. Doing so allowed the researcher to observe how students and teachers appropriated the digital tool in this new context and investigate how they combined different types of resources. Moreover, as an educational resource, digital tools are noteworthy for their

potential to incorporate multiple modalities (sound, movement, text, image, film) in their design and are referred to in this thesis as multimodal resources (Jewitt, 2006; Kress, 2010).

This study follows a teaching practice that supports students in relating a videogame to ethical theories, and it clarifies how students use language to make meaning and gradually construct narratives with theoretical intentionality. It describes how students use such cultural tools to express meaning and intentionality, namely how the role of videogames and teacher-led dialogues as tools in mediating moral reasoning aim at appropriation and mastery of the theoretical content. That is, it addresses how the moral agent appropriates mediational means, including ethical reasoning, to take a position in moral situations. Thus "moral development" refers to the process of mastery and appropriation by which people gradually use mediational means for meaning-making with the purpose of taking a position in such situations (Tappan, 2006). For Tappan (2010), moral identity is constructed as a result of interactions in the social world; such identity is also constructed through an ongoing dialogue and is mediated by specific cultural tools and ideological resources (Penuel & Wertsch, 1995; Tappan, 1998, 2010). In Tappan's words, an individual's moral identity is created by the "appropriation of a series of ideologically mediated identities … [that] were not generated simply by self-reflection, or by the construction of an inner sense of self-coherence. Rather, they were generated by acting (and interacting), positioning and repositioning, enacting and performing" (2010, p. 83). Interpersonal learning processes become internally-oriented and semiotically-mediated developmental processes within the individuals themselves. Tappan (2010) points to the importance of Bakhtin's (1986) idea of appropriating external authoritative discourse into internally persuasive discourse as useful for understanding moral development because of the profoundly self-engaged nature of the moral dialogic construction.

The importance of language and social interaction for learning informs the present study in the way it explores classroom dialogues as the interactional grounds for knowledge building and collaborative reason (e.g., Wegerif, 2007; Mercer & Howe, 2012). In this thesis, ***collaborative reasoning*** refers to the processes by which students use language and dialogue to construct meanings jointly. In these reasoning processes students jointly coordinate inferences to reach justifiable conclusions (Geil, 1998) by listening to one another as they engage in reasoned argumentation, integrating several voices representing contrasting perspectives (Rommetveit, 1992), considering others' points of view, and using personal experiences and evidence to support their conclusions (Clark, Anderson, Kue, Kim, Archodidou & Nguyen-Jahiel, 2003). In this thesis collaborative reasoning processes are described in Article I as "bottom-up" and "top-down". Detaching from specific cognitive connotations, these terms refer to the way participants´ reasoning moves from more practical and grounded examples to more abstract levels of thought (bottom-up reasoning processes) and vice versa (top-down reasoning processes). These dialectic movements between practical and abstract knowledge are described in Article I as part of a model that I have termed the ***anchoring process model***. The model mirrors the complexity of dialogically connecting abstract school content (ethical theories) to real life and demonstrates how students do this by relating fictional (the videogame) and life-based narratives (real-life examples).

The reasoning processes described in the anchoring process model illustrate students' reasoning movements between conceptual and practical knowledge, in close relation to what Vygotsky (1986) describes as linking ***everyday and scientific concepts***. Everyday concepts

refer to the concrete world; they usually have a local scope and do not need to be defined. According to Vygotsky, those concepts are spontaneously appropriated by children through their daily social interaction while engaging in joint activities in their community. On the other hand, developing scientific concepts implies participation in an educational setting. Developing scientific concepts is highly dependent on language, since scientific concepts begin to develop through their verbal definitions—which demands deliberate and systematic instruction. The instructional process of scientific concepts allows the child to move towards higher levels of thinking and thereby develop higher mental functions, in particular decontextualized abstract thinking. Scientific and everyday concepts are connected, however. As Douek (2006) states "the existence and development of everyday concepts and scientific concepts are closely related: scientific concepts evolve from abstract to particular groundings; everyday concepts can be refined into more precise (and eventually into scientific) concepts" (p. 449). The present study focuses on the teachers´ role in creating intercontextuality, i.e., how everyday and scientific concepts emerge in teacher-student interactions, integrating everyday knowledge into classroom dialogues and facilitating contact with new and existing ideas (Silseth, 2017).

Mediation can be defined as the use of certain tools within socially organized activities that people intentionally draw on to modify, understand and make sense of the environment. Different types of mediation are usually visible in classrooms such as those observed in the present study, including explicit and implicit mediation (Wertsch, 2007). *Explicit mediation* involves signs that are intentionally introduced into an activity—for example the ethical theories the teacher presents. *Implicit mediation* involves signs that are informally and implicitly introduced during the interaction—for example the way teachers use the first person when prompting students to discuss a character's actions in the game (e.g., "What should we do now? Should we lie?"). In adopting a sociocultural perspective, this study thus acknowledges the importance of both physical and psychological mediational tools (Vygotsky, 2016). The present research examines how physical tools (interfaces that are used in videogames) are combined with psychological tools (e.g., language and dialogues, theoretical content and narrative aspects of the game plot) to promote a knowledge-building process.

The concept of ***positionality*** relates to the way "pupils take on positions in relation to the task, including the use of different types of resources and representations" (Rasmussen, 2005, p. 39); the way students interpret the learning situation affects their positioning. Silseth and Arnseth (2016) describe positioning as a dialogic relationship between the student and the frame of an event. Positioning describes the movement by which a recognizable identity is explicitly or implicitly applied to someone during an event. Ultimately, positioning refers to how students are constructed as learners in classroom interactions. The present study adopts a view that is close to Silseth and Arnseth's (2016) idea: in this study positioning refers to the way students assume a multiplicity of roles with regard to the GBL tasks (e.g., player vs. student), as well as the possibility of assuming a multiplicity of voices that represent different perspectives and cultural identities. In the present study the students were encouraged to adopt different positions over time, share their points of view and embrace different tasks: for example, playing the game, participating in debates, making decisions, performing writing tasks and using apps to vote for their options. The study refers to how dialogue constitutes positioning work that supports the way students, content and contexts are positioned in the learning process.

To sum up: In this study traditional concepts of mastery, appropriation and positionality are applied to analytically account for collaborative reasoning processes of meaning-making. There is a particular focus on the teacher's role in constructing intercontextuality in students' learning trajectories, as everyday and scientific knowledge concepts are combined through GBL to learn about morality and ethics in citizenship education.

2.2. A dialogic perspective on learning

Dialogism is an epistemological approach derived from the ideas of Mikhail Bakhtin. The use of dialogic approaches in classroom contexts overcomes the traditional one-way monologic explanations of content. Dialogic classrooms create a dialogic space where communication is open-ended and multi-voiced. A voice is a speaking consciousness, a speaking personality, consisting of desire, timbre and overtones with cultural resonance. Dialogic learning environments allow participants to freely interact in their search for new meanings. Dialogue is seen as a continuous generative process filled with dialogic overtones that pay tribute to a plurality of voices (Bakhtin, 1986). In dialogic classrooms students develop a variety of argumentation methods, including adopting a position on an issue, supporting their own arguments with reasons and evidence, and challenging others' positions by responding to their counterarguments (Reznitskaya et al., 2009). Dialogism generates internally persuasive discourse, as opposed to authoritative discourse. While the latter imposes fixed and non-negotiable meanings, persuasive discourse is open and allows students to create new meanings. That is to say, "understanding is always dialogic to some degree" (Bakhtin, 1986, p. 111).

Wegerif (2006, 2007) notes the importance of promoting collaborative activities whereby multiple voices "inter-animate," thus creating dialogic spaces where students dialogically acknowledge and elaborate on other people's perspectives on a topic. As Alexander (2008, 2018) argues, dialogic teaching represents:

> the power of talk to stimulate and extend students' thinking and advance their learning and understanding. It helps the teacher more precisely to diagnose students' needs, frame their learning tasks and assess their progress. It empowers the student for lifelong learning and active citizenship … It requires: interactions which encourage students to think, and to think in different ways; questions which invite much more than simple recall; answers which are justified, followed up and built upon rather than merely received; feedback which informs and leads thinking forward as well as encourages; contributions which are extended rather than fragmented; exchanges which chain together into coherent and deepening lines of enquiry; discussion and argumentation which probe and challenge rather than unquestioningly accept; professional engagement with subject matter which liberates classroom discourse from the safe and conventional and classroom organization, climate and relationships which make all this possible. (Alexander, 2018, n.p.)

Not all class dialogues are dialogic. Sometimes dialogues assume a more dialectic form and authoritative tone in which the teacher leads the students to a desired idea. Burbules (1993) argues that recognizing the teacher as a more knowledgeable partner in a discussion does not necessarily threaten egalitarian relationships, and it even helps to enhance the potential of dialogic conversations in the classroom. He proposes a typology of classroom dialogue in terms of its four different goals: (1) dialogue can serve as instruction in which teachers provide

modeling and support for student learning; (2) it can be used as conversation, with participants sharing information, experiences and opinions, in order to build a community of shared knowledge and understanding; (3) it can be used as inquiry, by posing questions and offering explanations to lead participants in building a consensus on the best approach to a problem; and (4) dialogue can be used in the form of debate: a critical and combative stance whereby participants defend their opinions and interrogate those with opposing viewpoints. The goal of this fourth item is to help students build stronger arguments and gain clearer understandings of a given topic.

As Wegerif (2007) clarifies, one can say that both dialectic and dialogic approaches use conflict and tension in conversation. Nevertheless, in the dialectic process, one solution has primacy over all the others, and the goal is to merge the antagonistic views—thesis and antithesis—into some kind of agreement, known as synthesis. In a dialogic process, an utterance signals reciprocity but not necessarily agreement with another person's meanings (Haworth, 1999). In the pure dialogic stance, dialogues are ends in themselves and not the means to reaching agreement. In the traditional sociocultural view, meaning is sometimes related to a confluent synthesis of different perspectives. The richness of dialogism is found not in the achievement, but in the process itself. As perceived in this thesis, the dialogic process may include both open and closed instructions. Open instructions refer to the teacher giving students the possibility of using any theoretical frame for their reasoning, while in a closed instruction the teacher directs the students to use a particular frame for reasoning. A dialogic process may include both open and closed instructions, as long as the aim is always sustaining an open-ended chain of dialogic reasoning.

Producing utterances always entails a process of appropriating the words of others and, at least to some extent, making them our own (Wertsch, 1998). Social interactions that are filled with tension and conflict will be most beneficial to learning (Bakhtin, 1981). This idea is closely related to the concept of *interthinking* (Littleton & Mercer, 2013), which refers to dialogues whereby people not only verbalize different points of view but also collaboratively build on one another's contributions in order to further understand the meaning.

The present study views collaborative meaning-making as a dialogic process involving multiple voices and different perspectives that illuminate one another (Wegerif, 2006). Classrooms that offer a diversity of voices and communication challenges represent opportunities to expand the students' understanding of the world (Wegerif, 2006). As noted above, however, not all class dialogues are dialogic. Dawes, Fisher and Mercer, cited in Mercer and Dawes (2008), identified three types of classroom talk: *disputation*, which is characterized by disagreement and a lack of effort in terms of pooling resources for constructive interaction; *cumulative talk*, in which talk is used to share knowledge more than analyze ideas and is marked by a generally uncritical acceptance of others' opinions; and *exploratory talk*, in which everybody shares information and partners ask pertinent questions about the underlying reasons for people's opinions. Exploratory talk, although rare, is considered to be the most productive style of classroom talk (Littleton & Mercer, 2013). Such talk characterizes conversations in which people "interthink", with everyone engaging in the conversation both critically and constructively, which makes their reasoning visible throughout the talk (Littleton & Mercer, 2013). That is to say, in dialogic contexts, thinking skills shift from an exclusively individual territory to a common social ground (Wegerif 2006; 2007).

Wegerif (2006) argues that the use of information and communications technology (ICT) in learning contexts can alter the traditional class conversation and broaden and deepen the quality of learning. In the 21st century people frequently use multimodal resources to transform meaning in nonlinear environments. The multiliteracies pedagogical approach (The New London Group, 1996) describes how students use diverse multimodal information to become active meaning-makers, as they constantly remake signs and critically explore and become effective communicators (Cope & Kalantzis, 2009; Cooper, Lockyer, & Brown, 2013). Multiliteracies pedagogy incorporates four main inter-related components:

- *Situated practices*, which encourage learners to share and expand upon the learning process by drawing on their own experiences and valuing their previous knowledge, interests, and out-of-school relationships.
- *Overt instruction*, which encourages learners to take ownership of their learning. It is a type of active interaction where teachers introduce a skill or topic and, in direct and explicit lessons, help students to develop a metalanguage to address it, leading and monitoring student´s progress.
- *Critical framing*, which encourages learners to develop critical thinking skills and facilitate the process of students relating what they have learned to broader contexts.
- *Transformed practices*, where teachers encourage learners to apply what they have learned to redesign and expand knowledge into other contexts.

According to the multiliteracies approach, the learner takes the available multimodal representations of the world (*the designed*) and develops a metalanguage to address them (*designing*); the outcome of this process is called *the redesigned* (New London Group, 1996). It is important to note that one person's *designing* may become a resource for another's in an intertwined process (Cope & Kalantzis, 2009). In the present study, the multiliteracies approach helps in understanding how teachers facilitate the use of multimodal resources in GBL and how *designing* experiences are dialogically promoted.

2.3. Learning through play in the sociocultural tradition

Traditional views in the field of psychology, namely the vast body of work of authors such as Piaget and Vygotsky, relate play activity to development. As Vygotsky puts it: "In play a child operates with things as having meanings" (2016, p.14). In fact, "in play a new relationship is created between the semantic field—that is, between situations in thought and real situations." (2016, p.20). Moreover, in an imaginary action, "in order to sever the meaning of the action from the real action, the child requires a pivot in the form of an action to replace the real one. But once again, while before action was the determinant, in the structure "action-meaning", now the structure is inverted and meaning becomes the determinant." (2016, p.17). The relation between play activity and development is also true of moral development: play activities work as transitive elements for elaboration of emotional and moral reasoning, "as-if" actions facilitate moral behaviors and foster children's ability to renegotiate roles and rules (Bergen & Davis, 2011), and from a sociocultural perspective moral agency is seen as mediated action (Tappan, 2006).

Among play activities, videogames present unique characteristics (Wu, Hsiao, Wu, Lin & Huang, 2012). Videogames involve both representational features (the narrative) and

simulation features (interactivity). The scientific community divides when considering which of those aspects is more beneficial for learning, opposing narratologists (e.g., Murray, 1997) to ludologists (e.g., Juul, 2001). In this thesis, both paradigms have been considered valid; from a sociocultural stance, videogames are a multimodal space in which, *both* through narrative engagement and embodied experiences, players can learn content and produce meanings (Buckingham & Burn, 2007; Jenkins, Purushotma, Weigel, Clinton & Robison, 2009).

However, research opinions also divide on the usefulness of videogames as learning tools. Discrepancy in perspectives about the usefulness of entertainment is not new—the topic is often discussed in the classics as pointed out by Brown (2008). In Plato's *Republic*, for example, poetry is considered evil because it creates passions that could compromise the ideal society, while in Thomas More's *Utopia* a happy society, with serious restrictions regarding entertainment, still encourages people to engage in post-work play, which is designed to foster ethical reasoning. Brown (2008) presented these two stances as representative of the state of today's debate, with some authors pointing to the dangers of videogames and others defending their social utility. Some authors defend videogames as contributing to core civic competences: they provide safe environments in which hypotheses can be tested (Bergen & Davis, 2011); they offer possibilities for participation, decision-making and reflection on different possible outcomes (Lerner, 2014); and they imply management of diversity, ambiguity and uncertainty, promoting the capacity for adaptation (Haste, 2009). These characteristics differentiate videogames from other media and make them useful in CE. However, learning in videogames is controversial. Progressing in a game may not correspond to advanced learning processes. Mastering an activity (in this case gameplay) does not necessarily lead to any other content knowledge (Arnseth, 2006)—indicating a clear difference between "learning to play" and "playing to learn". Even if acknowledging the particular benefits of videogames as educational resources, not all researchers agree on how this potential can be harnessed in formal educational settings. It is also conceivable that not all cultures or countries would consider using videogames for learning purposes. These theoretical debates illustrate the unique features of videogames as learning tools.

Nevertheless, videogames are highly immersive experiences that many scholars consider to be extremely powerful from a learning standpoint, when compared with more traditional text narratives (Gee, 2003, 2004, 2006; Newman, 2004). Gee argues that good videogames are good "learning machines" (2004, p. 15) because they incorporate good educational principles. Gee identified 36 such principles (2003), later condensed into a 13-principle list (2004) that includes the following:

- In videogames, meanings are neither general nor decontextualized; the information is presented just in time and on demand (i.e., contextualized, only when necessary and comprising the right amount);
- Learning in videogames works in cycles of expertise (i.e., players are only confronted with greater challenges once they have mastered smaller ones);
- Videogames are problem-based and require active agency on the part of the players in terms of making decisions that then commit them to the resulting outcomes;
- Videogames offer a secure environment for learning in which failure is allowed;

- Learning in videogames is a bottom-up process in which the generality that meanings come to have is discovered via embodied experiences (i.e., from the playing experience, the player develops conceptual knowledge and scientific reasoning);
- Videogames support progressive autonomy, with the early levels of the game supporting players much more than the more advanced ones;
- In videogames, players customize and take responsibility for their own learning paths (see also Felicia, 2009);
- In videogames, players may try out different solutions while creating their own learning paths (Gee, 2003; 2006).

Gee claimed that the design of school learning environments could benefit from adhering to some of the same principles (Gee, 2006). This thesis takes up part of this idea and examines how the design of a classroom learning environment may be altered by dialogically extending engagement from a game setting to a classroom.

The unique characteristics of videogames make them interesting objects of study among different theoretical perspectives within learning sciences (Wu, Hsiao, Wu, Lin and Huang, 2012). Behaviorist studies point to games as means for increasing players' trained skills; cognitive studies focus on how memory and information processing works when learning with videogames; and sociocultural studies deal with the interactional aspects in GBL activities. This latter perspective informs the present study as it studies sociocultural factors and teachers' designs of learning environments relevant to clarifying the relationships between engagement with videogames and learning (Iacovides, Aczel, Scanlon, Taylor & Woods, 2011).

2.4. Learning through engagement in the sociocultural and dialogic perspectives

The theoretical and empirical literature reflect little consensus about definitions and measurements of student engagement. Axelson & Flick (2011) review the use of the term engagement over 70 years, and point to the two uses of it: "1) as an accountability measure that provides a general index of students' involvement with their learning environments; and 2) as a variable in educational research that is aimed at understanding, explaining and predicting student behavior in learning environments" (p. 41). As taken in the study, engagement is not seen as identical to involvement. Students may involve themselves in one activity without being intrinsically willing to participate in it. Engagement is here more conceptually close to the idea of a student´s initiative, which implies intrinsic motivation, interest and enjoyment (Ainley, 2012). Most literature about engagement oversimplifies the concept and uncritically focuses on its positive effects (Trowler, 2010). This study avoids assuming a normative view and perceives engagement as part of a greater process that includes the mobilization of several mediational means. Despite a multiplicity of attempts to define engagement, it is commonly accepted that student engagement is a multidimensional construct, including emotional, behavioral and cognitive aspects (Fredricks, Blumenfeld & Paris, 2004), with contextual dependency (Lawson & Lawson, 2013). I acknowlege Perry, Turner and Meyer´s (2006) suggestion of the need to take an ecologic view—such as the sociocultural perspective—to fully understand how engagement can be studied. This study considers engagement under the situated aspects of the whole classroom learning environment. The sociocultural perspective relates engagement to contextual and interactional aspects of the learning environment (Greeno, Collins & Resnick,

1996; Lawson & Lawson, 2013). In that sense, engagement is here seen as socially negotiated and culturally dependent, and understanding engagement in the classroom requires a contextual and interactional approach (Lawson & Lawson, 2013). Learning and engagement are co-constructed and co-negotiated within class activities (Hickey, 2003) and depend on how both resources and the teacher support knowledge construction (Wood, Bruner & Ross, 1976). The relevance of these views to the present study is in explaining how context and instruction might serve to mediate the way engagement leads to transformation of individual experiences into formal academic structures (Vygotsky, 1978): how engagement with gameplay experience extends to learning about ethical theories.

An important theory in learning through engagement in GBL involves the concepts of *consequential engagement* and *transformational play* (Gresalfi, Barab, Siyahhan & Christensen, 2009; Barab, Gresalfi & Ingram-Goble, 2010; Gresalfi & Barab, 2011; Barab, Pettyjohn, Gresalfi, Volk & Solomou, 2012). Transformational play (TP) is a theoretical framework that describes how serious games are designed to include elements that promote a kind of engagement that facilitates learning. Barab and his colleagues have been working on designing such games. TP videogames promote the positioning of person, content and context in the following way (Barab et al., 2012):

- Positioning person with intentionality: the player is invited to take on the role of the protagonist with the responsibility of making choices in a fictional context; the player is empowered as an agent of change, acting with intentionality, and perceiving her choices as actually mattering to impact the game story; thus, she is taking part in designing an open emergent narrative that will change depending on her own will;
- Positioning content with legitimacy: the content is positioned as a valid resource to solve problems within the game setting. The player is encouraged to use academic concepts, relating domain-specific content to the game narrative, to resolve fictional problematic situations. Thus, academic content is not perceived as isolated and decontextualized but rather experienced as situated knowledge. Positioning content with legitimacy also facilitates the player to critically analyze the consequences of personal actions conceptually and perceive herself as someone capable of solving problems in this manner.
- Positioning context with consequentiality: the game context is designed as a dramatic story that is modifiable according to the players' choices. This provides meaning to the player's decisions once she can perceive the effective consequences of her choices. Game environments are, then, designed as situated scenarios to contextualize learning.

Building on sociocultural approaches and activity theory, TP framework underlies the idea that learning in videogames involves active participation (Barab, Gresalfi, & Ingram-Goble, 2010). It describes how players transform videogames into resources that are meaningful for learning and become themselves transformed in the process. However, not all forms of engagement with videogames are effective to learning (Gresalfi & Barab, 2011). Videogames designed for TP allow students to learn because they promote students to engage with knowledge content in particular ways. Gresalfi and Barab (2011) describe four levels of engagement that can be achieved during GBL. The simplest level is called *procedural engagement*, and it refers to the involvement players have with the game action. This level of engagement may lead students to act in the game but without exactly understanding why, i.e., with no other purpose than

proceeding with the game action. On a second level, students may develop *conceptual engagement*, which leads students to start applying disciplinary concepts to some extent. However, only more elaborated forms of engagement, such as *consequential engagement* will actually allow those concepts to be perceived as disciplinary tools that are meaningful to accomplishing goals in the real world. On the highest level, *critical engagement* will imply that students are able to reflect on the way they apply these tools. According to Barab (2016), learning in GBL implies developing higher forms of engagement. This thesis uses the concepts of TP and consequential engagement to clarify how dialogical aspects in GBL design may sustain a similar process despite using a COTS game.

As mentioned, not all kinds of engagement are equally productive for disciplinary work (Kumpulainen, 2014). Different forms of engagement lead to different ways of appropriating and mastering disciplinary knowledge. Engagement in GBL is moderated not only by the gaming experience (Deater-Deckard, El Mallah, Chang, Evans & Norton, 2014) but also by the learning design and nature of related tasks (Eseryel, Law, Ifenthaler, Ge & Miller, 2013). This applies both to designing digital learning environments such as games (Gresalfi & Barab, 2011) and designing learning environments in classroom contexts (Engle & Conant, 2002). According to Bransford, Brown and Cocking (2000), the design of good learning environments should consider the following aspects: learning environments should be learner-centered, knowledge-centered, assessment-centered and community-centered. A *learner-centered environment* connects to students' interests and previous knowledge and helps students to gain insight into themselves as learners. A *knowledge-centered environment* aims for students to achieve the desired curricular goals. An *assessment-centered environment* provides many opportunities for students to receive feedback while they create new meanings and new understandings, and a *community-centered environment* allows students to work collaboratively and perceive the classroom as a safe environment to ask questions and issue opinions. It also connects school content to relevant external communities by adapting content relevant to out-of-school contexts and promoting lifelong learning skills.

In this thesis, the design of learning environments refers to the whole educational design, meaning the way teachers organize and enact activities and resources through learning trajectories (i.e., the unfolding processes of the activity over time). That is to say, educational design concerns both design for teaching—how the teachers interpret the curriculum and plan activities—and design for learning—the teacher's enacted design as classroom events occur (Hauge, Lund & Vestøl, 2007; Lund & Hauge, 2011). This study considers both because the combination "has the potential to build conceptual bridges between learners' life worlds and institutional goals" (Lund & Hauge, 2011, p. 262).

Engle and Conant (2002) proposed a framework for designing learning environments to create engagement that productively leads to learning about disciplinary content in the classroom. This framework is called productive disciplinary engagement (PDE). The term disciplinary was used by the authors to refer to the "contact between what students are doing and the issues and practices of a discipline's discourse" (Engle & Conant, 2002, p. 402). Engle and Conant's (2002) seminal study followed a 5th grade student controversy where the authors isolated PDE indicators, such as (1) students making substantive contributions to the topic under discussion; (2) students' contributions made in coordination with each other, rather than independently; (3) only few students involved in "off-task" activities; (4) students attending to

each other, aligning eye gaze and body positioning; (5) students expressing passionate involvement by making emotional displays; and (6) students engaging with the topic over long periods of time. Engle and Conant (2002) concluded that the learning design has contributed to engaging students in a disciplinary matter. This type of engagement enrolled students in an increasing capacity of using disciplinary discourse to gradually create more complex arguments and establish relevant connections. They identified four guidelines for teachers to further promote PDE:

- Problematizing—encourage students to problematize topics instead of vertically assimilating teacher's explanations;
- Authority—give students authorship over their own contributions and intellectual agency to collaboratively solve problems;
- Accountability—ask students to account for disciplinary standards and others' ideas while elaborating their own arguments and justifying their own positions;
- Resources—provide students with the adequate resources for this work, including access to relevant information and enough time and support to perform tasks.

These are not presented as pure "designing principles" but as aspects of learning situations that serve as guidelines in promoting PDE. An important part of the teacher's role is to deal with multiple tensions while integrating several resources and mediational tools. This includes maintaining constant balance between the four guiding principles over time (Engle, 2012). For example, balancing the axis *authority-accountability* allowed students to feel encouraged to author their own ideas, although within the frame of good quality argumentation. In the same way, balancing the axis *problematizing-resources* allows the situation to be challenging in about the right measure to allow interest but avoid frustration.

The teacher's enacted design is central within technology-rich learning environments (Hanghøj, 2013; Rasmussen & Ludvigsen, 2010) and within GBL in particular (eg. Silseth, 2013). This is even more striking when, as in the present study, GBL uses a COTS videogame that was not created for any type of engagement other than entertainment. PDE framework is relevant for this thesis because it helps describe how class dialogues may extend engagement with gameplay to be disciplinarily productive.

2.5. Positioning my study

This thesis studies GBL as (1) a whole-learning situation that (2) makes use of a videogame and (3) extends this game with pedagogical methods, including diverse educational resources (physical or intellectual) and didactic activities, in order to (4) intentionally create an engaging learning experience with specified knowledge content (ethical theories).

Theoretically situated in the field of sociocultural and dialogic education, the thesis analyzes how classroom interactional aspects engage students and help to mediate the learning experience with the videogame. It focuses on the designing of COTS GBL and describes the integration of multiple learning resources as well as the teacher's dialogic role in orienting students' approaches to gameplay.

Empirical studies that address evidence for academic learning or describe contextual learning processes using COTS videogames are rare, and the present study contributes toward

bridging this knowledge gap. The study addresses two empirical cases of COTS GBL, in three different sub-studies presented in three different articles (enclosed in part 2 of this thesis).

- In article 1, I use classic concepts from the sociocultural and dialogic traditions to describe how both the teacher's dialogic approach and the nature of the videogame worked together to mediate GBL. I propose a theoretical model for collaborative reasoning in GBL, which I term *the anchoring process*, after having described how the gaming experience was translated into a learning experience.
- In article 2, I further investigate how the teachers' instructional and enacted designs contributed to that. I took an innovative stance by adapting the TP framework (which was developed for the design of serious games as learning environments) to an empirical investigation with a particular focus on the teachers' dialogic interactions and enacted design of COTS GBL. I describe how the dialogic approach contributed to the positioning of person, content and context in ways that resemble transformational play.
- In Article III, I describe how the teacher's enacted design extended students' engagement with the game, making it disciplinarily productive. Since designing for TP in serious games implies facilitating higher forms of engagement, such as consequential and critical engagement, in article III I used the PDE framework to explore how that also applies to dialogic COTS GBL.

3. Literature review

In this chapter, I review research that will help me examine a teaching practice that employs GBL activities in classrooms, in combination with a dialogic approach, to teaching students ethical reasoning. The question of how digital technology supports a dialogic pedagogy requires more exploration. Research usually approaches GBL as a complementary supplement to other traditional teaching methods, making it difficult to isolate videogames' contribution within the whole situational learning context. Many authors convey the idea that sociocultural and situational aspects are crucial in GBL. This chapter therefore takes a broader approach and reviews the research and literature that frame GBL within the larger discussion on the use of technology in dialogic classroom environments. To my knowledge, there are no previous studies that have conducted such an examination of classroom use of a COTS videogame. The criteria for selecting the reviewed studies intended to describe GBL as a research field, and in particular focus on the potential offered by GBL to learning from a sociocultural perspective. Rather than defend GBL as a practice, this selection is representative of on-going discussions, namely about the potentials and difficulties of using videogames as part of school learning, and particularly to learn about ethics and citizenship. By doing this I identify what I consider the main debates and tensions in this field and where there is need for further research. Journal articles and books, as well as other relevant documentary sources from websites, media articles and official reports, were considered to be of relevance.

3.1. Game-based learning as a research field

3.1.1 The moral impact of playing videogames

Some researchers have argued that videogames can adversely affect players' moral attitudes (e.g., Carnagey, Anderson & Bushman, 2007; Hartmann & Vorderer, 2010; Konrath, O'Brien & Hsing, 2011). They claim that exposure to violent videogames can result in desensitization to real-world violence (Carnagey et al., 2007), which undermines moral emotions such as guilt (Hartmann & Vorderer, 2010) and decreases empathy levels (Konrath et al., 2011). Some authors have even correlated the length of time playing violent videogames with poorer school performance, increased aggression and attention problems (Hastings et al., 2009).

Other researchers (e.g., Ferguson et al., 2015) have argued that these negative effects have been exaggerated. For example, Olson, Kutner and Warner (2008) concluded that violent videogames can help address anger and relieve stress. With some exceptions, violence in videogames is not random but underlies an ethical system that hinders violence against the weak and in which violent acts tend to be justified, in the sense that enemies are clearly identified and will kill if not killed first (Brown, 2008). Zagal (2009) defended the ethical frames of some COTS videogames and Sicart (2010) suggested that violent videogames can lead to moral reflections. Simkins and Steinkuehler (2008) proved the importance of some COTS role-playing games, even violent ones, in fostering critical ethical reasoning. They interviewed gamers about moral decisions they had made while playing a COTS game of their choice and identified discourse elements evidencing empathy, engagement and critical ethical reasoning.

Brown concluded that games are valid platforms for moral instruction because the participatory activities act as "mirrors for self-examination" and "mediate ethical inquiry through simulation of moral choice" (2008, p. 83). Games' interactive aspects increase complexity by collapsing objective and subjective experience; they usually do not express direct didacticism in order not to alienate potential players, but some videogames are designed with the premise that "decisions rather than dicta promote a more acute moral awareness" (Brown, 2008, p. 89); choices and consequences are part of the games' ethical systems. Following this view, the study of GBL activities that foster moral reflection about one's actions—as occurs in the practice that this thesis examines—is worthwhile, and particularly important in CE, because the intention regarding this subject is for learners to relate their thinking and actions in the school setting to the global world. Blevins, LeCompte and Wells (2014) studied the implementation of an online civic education gaming program in 13 classrooms and presented qualitative and quantitative evidence of gains in students' content knowledge.

An overview of empirical research shows that some videogames promote civic experiences: guiding others, organizing groups, learning about societal problems, making decisions and exploring social, moral or ethical issues (Bers, 2010). A survey by the Pew Internet and American Life Project (Lenhart et al., 2008) found that 52% of young people questioned felt that videogames had taught them about societal problems, and 65% felt that videogames made them think about moral and ethical issues. The same report found that teens who had more experience of civic gaming were more likely to report interest and engagement in civic and political activities.

3.1.2. Research trends in GBL

Interest in GBL is rooted in the military arena, where digital games and simulations were used for training practice (Smith, 2010). Despite the highly contradictory literature from the 1990s on the benefits of videogames (Randel, Morris, Wetzel & Whitehall, 1992; Dempsey, Rasmussen & Lucassen, 1994), research into combining videogames with other tools for learning has greatly increased during the last decade. This thesis identifies three main research trends. The first trend, which is derived from seminal works by James Paul Gee (2003, 2004, 2006) and Marc Prensky (2003), defends the idea that some mainstream COTS videogames are embedded with excellent learning principles and promote learning experiences. The second trend argues the need to create educational videogames (also called serious games in the literature) that are especially designed for learning purposes while maintaining the favorable engagement potential of COTS videogames (Shaffer, 2006; Sanchez, 2013; Barab, Gresalfi & Ingram-Goble, 2010; Barab et al., 2012). The third trend, which calls for more integrated analyses of the GBL phenomenon, perceives GBL as a broader system that includes not only videogames but also how their use is pedagogically framed. This third trend entails considering pedagogical and contextual aspects such as instructional elements and other game-related activities (Van Eck, 2009; Hanghøj, 2013), focusing on sociocultural aspects, in keeping with the theoretical framework for this study.

3.1.3. Educational vs. commercial videogames

The discussion about what types of games should be used for learning purposes is ongoing, with several authors defending the use of educational games over COTS videogames (e.g., Marino & Hayes, 2012; Shaffer, 2006; Sanchez, 2013; Barab et al., 2012). Marino and Hayes (2012), in their response to Muñoz and El-Hani's (2012) critique of the benefits of videogames in education, argued that commercial videogames are not representative of the educational potential of videogames; they defended the benefits of serious games. Linderoth (2012) pointed out that some COTS games involve elements that might hinder learning because the skills players learn are often not realistic enough to provide accurate knowledge about the world. Also, Shaffer (2006) criticized the unrealistic approach of COTS games (such as *SimCity*) and defended a form of educational game that he calls epistemic games, such as *Urban Science*, in which players follow realistic scientific rules while playing. Presenting embedded learning instruction beforehand in serious games elicits active and deeper learning without having a negative impact on motivation (Erhel & Jamet, 2013). Researchers have designed educational games that require using academic content to solve problems in the game, and so facilitate "transformational play" (Gresalfi et al., 2009; Barab et al., 2010; Gresalfi & Barab, 2011; Barab et al., 2012). However, the engagement levels promoted by COTS games are difficult to achieve in educational games (Egenfeldt-Nielsen, 2006). Although it is extremely challenging for game designers to achieve a good balance between entertainment and educational elements in serious videogames, this balance is crucial if meaningful learning is to be achieved in GBL (Johansson, Verhagen, Åkerfeldt & Selander, 2014).

It is not only educational videogames that have been considered in the literature. Early reports such as those from the British Educational Communications and Technology Agency (BECTA, 2001) and Teachers Evaluating Educational Multimedia—TEEM (McFarlane, Sparrowhawk, & Heald, 2003) have referred to the many benefits of using COTS games in formal curricular settings, namely to foster student engagement, promote collaboration, increase motivation and contribute to the development of students' thinking skills. For example, the game *Minecraft* is highly regarded in the literature for its usefulness in teaching various academic subjects (Short, 2012; Ekaputra, Lim & Eng, 2013). The recognized potential of this COTS game has even led to the creation of a commercial educational version of *Minecraft*. Franklin, Peat and Lewis (2003) argued that "games foster group cooperation and typically create a high level of student involvement that makes them useful tools for effective teaching" (p. 82).

Yet finding empirical results that demonstrate that academic content can be learned by using COTS games remains difficult. Literature on the topic is essentially descriptive (e.g., Ekaputra et al., 2013) or prescribes premises to be adhered to when using COTS in GBL (e.g., Van Eck, 2009). Some studies have established a positive relationship between playing COTS videogames and increased cognitive competencies (Okagaki & Frensch, 1994; Fabricatore, 2000; Boot et al., 2008), but few have empirically proven learning benefits of disciplinary and academic content. In their review of 15 years of empirical research into learning outcomes from videogames, O'Neil, Wainess and Baker (2005) concluded that "the evidence of potential is striking, but the empirical evidence for [the] effectiveness of games as learning environments

is scant" (p. 468). This study aims to contribute to clarifying learning processes of academic content when using a COTS GBL.

3.2. The use of videogames in a classroom context

Whether games are educational or commercial, the use of videogames in a classroom context requires the translation of a gaming experience into a learning experience. Empirical studies on the use of educational games have found better learning outcomes than with traditional instructional methods (e.g., Virvou, Katsionis & Manos, 2005; Arici, 2008; Tüzün, Yılmaz-Soylu, Karakuş, İnal & Kızılkaya, 2009). However, as mentioned before, games are usually used as a complement in wider teaching practices, so it is difficult to determine which factors actually promote learning. It has been empirically shown that the productive use of technology, within formal learning, relies on how the tool is integrated with other resources and within the teacher's enacted design (Krange, 2008). Tools are neither effective nor ineffective by themselves (Rasmussen & Ludvigsen, 2010; Mercer & Howe, 2012), and digital interactivity by itself enables only reactive behavior (Westin, 2009). GBL is particularly empowering when passive consumption is transformed into the active production of meaning (Jenkins et al., 2009), but active interpretation requires advanced pedagogies (Verenikina, 2010) in relation to explicit values, demands and expectations embedded in the educational setting (Furberg & Ludvigsen, 2008). In his overview of research into the educational use of videogames, Egenfeldt-Nielsen (2006) argued that, from a sociocultural stance, the environment around videogames is vital for negotiating and constructing knowledge. Barab and Squire's (2004) findings demonstrated that even serious games, designed to provide some of this support themselves, were more effective when integrated with other instructional methods. This aspect is particularly important with those COTS games in which the links between the game and the curriculum are not evident.

Linderoth (2004) analyzed social interactions in playing sessions and found that games were not good learning tools by themselves. For learning to be effective, games must be embedded in wider pedagogical practices (Arnseth, 2006). The way in which activities are organized in the educational design is important, and research claims the potential for using collaborative activities in GBL (Sanchez, 2013; Sung & Hwang, 2018). When all students share a common game experience, they can relate to the points and counterpoints of their peers, which is very valuable for learning (Charsky & Mims, 2008). Sanchez (2013) not only considered the importance of the design of epistemic games but also demonstrated the importance of what he termed *epistemic interactions*. Empirical studies showed that groups who worked collaboratively in GBL presented a higher level of learning achievement and better problem-solving awareness (Sung & Hwang, 2018) and more positive attitudes toward school content (Ke & Grabowski, 2007) than the students working individually. Games benefit from instruction, and the teacher's enacted design is needed to support students' engagement with content in ways that go beyond mere mastery of the tool (Gresalfi et al., 2009). These findings are important for the present study because they indicate how different instructional designs in GBL can provide different results.

Kebritchi (2010) defended using games as a supplement to, rather than a replacement for teaching. Technology-rich classrooms, with added layers of interactivity, appear to actually increase the need for guidance (Lund & Rasmussen, 2010). Effective guidance includes methods such as the use of discussions that prompt students to verbalize their knowledge and

connect to previous knowledge (Wouters, et al. 2013). Charsky and Mims (2008) proposed three types of instructional activities that teachers should implement to facilitate learning in GBL: Firstly, help students learn to play the game; secondly, complement the gameplay with activities that correct any misunderstandings and provide supplementary information for the students; thirdly, implement finalizing activities that require the students to critique and evaluate the entire game activity as a model of the disciplinary content. These three activity sequences bridge the gap between playing a game for fun and playing a game as a learning resource. According to Van Eck (2009), videogames may be used prior to the studying of new material as an orientation activity to establish relevance, context and interest, or during the study of new material as a means of providing practice and feedback. Games can also be used as a hybrid of both, with game activities serving "as an anchoring environment that encapsulates the full learning cycle" (p. 14). In addition, the pedagogical activities that teachers develop for the use of games in the classroom are often perceived to be more effective if the side activities maintain the same kind of engagement as that offered by the game, which implies that the activities align with the game in a manner that preserves both the situated nature and fantasy aspects of the game narrative (Van Eck, 2009).

3.2.1. Designing of learning environments in GBL

The primary challenge when teaching with videogames is thus how to develop good educational practices (Hanghøj, 2013). In a report commissioned by BECTA, Pivec (2009) claimed the importance of what he terms the meta-game, meaning that not just the game itself is important but also how the game is used within a specific environment. Lacasa et al. (2008) studied how videogames, supported by other classroom activities, contributed to the development of narrative thought and found that the children's reconstructions of videogames' stories were dependent on the other tasks associated with gameplay. Van Eck argued that "we can easily augment the game with instructional activities that preserve the context (situated cognition) of the game (e.g., by extending the goals and character roles of the game into the classroom)" (2009, p. 24). He also argued that GBL should be designed to be student-centered and problem-based, using technology as a tool to enhance learning through the use of real-world data to solve problems. Knowledge resources should focus on facilitating understanding and not only on memorization, and GBL activities should not be passive but should instead allow for a process of knowledge construction (Lacasa et al., 2008).

Recent research defends the importance of the teacher's role, pedagogical elements and didactic activities along with the gameplay (Hanghøj & Brund, 2010; Hanghøj, 2013). Egenfeldt-Nielsen (2006) described the teacher's role as "imperative for the learning experience" (p. 205). Moreover, Hanghøj (2013) introduced the term *game-based teaching* and reflected on the dynamic aspects of a teacher's interventions and positioning during GBL.

One important aspect of the teacher's role is making learning goals clear and providing learning instructions (Silseth, 2013). Neville, Shelton and McInnis (2009) argued for the need to clarify the place of the game in the learning process and Kronenberg (2016) defended the inclusion of meaningful pre-teaching and reflection activities as well as support during these activities. As mentioned before, empirical research has proven that guidance is crucial in order for GBL to be productive (Squire, 2005).

A second aspect of the teacher's role refers to the learning design and integration of multimodal resources. The pedagogic potential afforded by technology and teaching interactivities is located in the enacted combination of resources (Beauchamp & Kennewell, 2010). Previous studies have pointed out the importance of teachers feeling confident in using this new media to unify multiple and distinct modes of representation, communication and experience (Bourgonjon & Hanghøj, 2011). Neville, Shelton and McInnis (2009) suggested the careful introduction of games into the curriculum. This can be done either by integrating the games "into existing, more familiar instructional approaches or by designing instruction exclusively around the game experience so that game activity can be seamlessly blended with classroom activity and homework assignments" (p. 420-421). When the COTS GBL learning environment provides a meaningful context in which doing (i.e., playing the game) and knowing (i.e., the content-oriented instructional activities) become intimately linked, students can develop a sophisticated understanding of the content (Charsky & Mims, 2008). Silseth (2012) emphasized the importance of integrating an educational game with other available resources for meaning-making. He moreover stressed the importance of the teacher's role in helping students manage tasks and resources in order to help expand their understanding of important issues raised in the game.

A third aspect of the teacher´s role in GBL is the need to promote reflection. Collaboration, debriefing and discussion are crucial to understanding. In post-play reflections, students can discuss the connections between the game and the curriculum (Felicia, 2009).

3.2.2. Difficulties in implementing GBL

One reason for the difficulty of both implementing COTS GBL and establishing empirical evidence of disciplinary learning from the practice might be that the content in COTS videogames does not generally align with school curricula. A wider problem is the need to rethink the cultures within our schools to encourage a more welcoming approach to these new practices (Foster, Shah & Duvall, 2015; Squire, 2005). Foster et al. (2015) pointed to a lack of professional development in teacher-education programs that focus on competence in adopting GBL. Previous teacher surveys have shown that the greatest barriers to the use of COTS videogames in the classroom include (1) teachers' weak background in games and technology, (2) teachers' lack of time to integrate games into their teaching, (3) the perception of insufficient evidence to support the games' learning usefulness, (4) the generally poor alignment with existing curricula (Ritzhaupt & Gunter, 2010) and (5) the belief that COTS games offer little to no educational value (Sandford, Ulicsak, Facer & Rudd, 2006). Only a minority of teachers believe that COTS gameplay is an important tool for school use, although many teachers list educational games as important (Marklund & Vinnervik, 2009).

Videogames are among the technological innovations that present high levels of engagement potential (Corno & Mandinach, 2004). However, studies that relate engagement in game experiences to learning have presented contradictory findings (Sabourin and Lester, 2014; Admiraal, Huizenga, Akkerman & ten Dam, 2011). A COTS videogame used in the classroom will not necessarily be an engaging and successful experience for all the students, especially when the learning goals are unclear (Squire, 2005; Bourgonjon, Valcke, Soetaert & Schellens, 2010). Squire (2005) studied the use of *Civilization II* for exploring world history and found that both the teacher and the students required clear learning goals in GBL. Bourgonjon et al.

(2010), who surveyed 858 secondary students regarding their perceptions of the use of videogames in the classroom, corroborated the importance of having clearly perceived learning opportunities, which is not so obvious in COTS games.

3.3. Dialogic teaching of ethics, morality, and citizenship via videogames

Empirical studies show that dialogic teaching methods can facilitate learning processes (Adey, 1999; Buty & Mortimer, 2008; Hajhosseiny, 2012). Adey (1999) compared classes from several school levels in a three-year program and showed that teachers supporting reflexive abstraction led to higher grades, with clear extended effects on other school subjects. The author concluded that several aspects were important, particularly: (1) the role of the teacher in designing good learning contexts and in intervening to guide students toward the learning goal; (2) setting the scene by connecting the activity to the students' current knowledge; (3) explaining the task by providing access to vocabulary; (4) using group work, such as discussions; (5) inviting more vulnerable members of the class into the dialog; (6) challenging students at slightly above their current level of knowledge; (7) sharing ideas in plenary presentations; (8) developing activities in which the teacher asks questions that require students to reveal their thinking processes; and (9) linking knowledge to other contexts and to the students' experiences to date. Hajhosseiny (2012) showed that dialogic teaching methods on university students—such as group discussions and Socratic dialogic methods—improved both students' critical-thinking and the quality of their social interactions. Scott, Mortimer and Ametller (2011) investigated ongoing meaning-making interactions in the classroom in science classes at lower secondary school, and concluded that it is essential that teachers determine the impact of prior knowledge connections for link-making and conceptual development. They identified three pedagogical link-making forms: supporting knowledge-building, promoting continuity and encouraging emotional engagement. Of chief relevance was the teacher's expertise in building connections between different learning experiences or several conceptual understandings. Buty and Mortimer (2008) analyzed teacher-student interactions and showed how difficulties in the teacher's management of dialogic teaching negatively affected the students' meaning-making of curricular content. The present study contributes toward investigating teachers' expertise in using pedagogical link-making forms for the construction of deep learning of conceptual scientific knowledge.

Recent studies demonstrate how dialogic talk can be productively sustained both in whole-class interactions and small-group talks. Reznitskaya et al. (2009) reported that the use of dialogic discussions in small-group work in elementary-school classrooms fostered the development of individual argumentation skills. Haworth (1999) stresses the benefits of small-group talk: firstly, by interrupting the IRF pattern (teacher *initiation*, student *response* and teacher *feedback*) in which the teacher treats students as mere respondents who are rarely asked to express their own perspectives; and secondly because such interactions overcome the traditional emphasis on the teacher's perspective as the most qualified, and offer space for students' alternative voices. She analyzed primary school students working together and concluded that small-group interactions set a better foundation for fostering dialogic talk than whole-class interaction did. She also found that the type of whole-class interactions sometimes influenced children's discourse while working together in small groups, because students tend to follow perceived patterns. However, at other times, when working together in small groups, children were able to merge the explicit language used in formal teacher expositions with a

more relaxed, creative and informal type of talk. This created a genre of small-group talk that is not reducible to everyday conversation, nor to normative classroom interactions. Haworth concluded that "without explicit teacher intervention, whole-class interaction is unlikely to foster plurality and heterogeneity in voice and genre on which dialogic talk depends" (1999, p. 114).

Nevertheless, as Sedlacek and Sedova (2017) have empirically demonstrated, whole-class interactions also offer these possibilities, namely through the use of open discussions. They found that open whole-class discussions also stimulate engagement beyond traditional IRF. Students' participation in whole-class talk might be stimulated both by the teacher and the influence of other students who are participating in a productive way. The way students respond directly to their classmates, rather than being directly asked by the teacher, resonates with Bakhtin's (1981) conception of dialogue as the inter-animation of different voices. Sedlacek and Sedova (2017) concluded that the way students participate in the classroom is context-dependent and that dialogic discourse offers benefits for the class as a whole. Moreover, if the type of whole-class talk influences the way students talk in small groups (Haworth, 1999), then it is especially important that teachers use dialogic talk in whole-classroom interactions. These nuances are relevant for this thesis, which studies collaborative reasoning in both settings.

3.3.1. Dialogic teaching and technology-use in Citizenship Education

The 2016 International Civic and Citizenship Education Study (ICCES) found that, although the participating countries presented different pedagogical implementations of the curricula, CE aims were in all countries broader and deeper than simply mastering civic facts. Worldwide, citizenship education curricula aim to promote students' critical and independent thinking, develop students' conflict-resolution skills and enable them to communicate through discussion and debate (Schulz et al., 2018). Research corroborates that both dialogic approaches and technology can be of help.

Dialogic methods are important in CE as civic learning occurs through social interactions at school (Ainley, Schulz, & Friedman, 2013), and this also depends on discussion during lessons (Schulz & Brese, 2008); an important aspect is the interpersonal school and classroom climate (Huddleston, 2005; Bäckman & Trafford, 2007), namely the students' perceptions of openness in classroom discussions (Schulz et al., 2018). For example, Norwegian students perceive their classrooms as open, and their civic knowledge has been found to be greater than the international average (Huang, et al., 2017). Dialogic environments also promote critical thinking (Schuitema, et al., 2011), which prepares students to move from agency to authorship during moral actions. Morality is not merely an assemblage of theorems or precepts about human conduct but a practice (i.e., an activity) that facilitates human interaction, since it is fundamentally pragmatic and socially constituted (Tappan, 2006). Turiel (1966), in an empirically based argument, asserted that moral education should involve students in discussions that offer moral conflicts, thus allowing different perspectives to arise. Blatt and Kohlberg (1975) conducted a12-week empirical study based on the principle that the teacher should lead students to reflect on morality in classroom activities that expose students to the stage of moral reasoning directly above their own. Pre- and post-tests of moral reasoning showed better results than in the control groups, with results holding for one year after the study. The conception of moral functioning as a sociocultural activity has profound implications for

how perceptions of moral education are formed. For Tappan (2010), moral education is a process of guided participation in which parents, teachers and more competent peers help children to attain new and higher levels of moral functioning. Empirical studies demonstrate the importance of teachers' design and support of class dialogue in the field of citizenship and moral education (Michaels et al., 2008; Schuitema et al., 2011; Willems et al., 2013). Willems et al. (2013) qualitatively analyzed teachers' comments in the classroom and concluded that three aspects are of key importance to the teacher's role in supporting moral classroom conversations: firstly, encouraging students to be morally reasonable, namely by asking "why" questions and querying students about their moral opinions and behaviors; secondly, stimulating students' emotional involvement by asking them to empathize with the people involved in the story under discussion and relate the situation to a personal, real-life experience; and thirdly, guiding students toward virtuous behavior by using non-motivated moral statements (i.e. without presenting the teacher's own moral opinions). Michaels et al. (2008) proved that promoting accountable talk is essential for the development of student capacities and dispositions for reasoned civic participation. Schuitema et al. (2011) empirically studied the quality of student dialogue in the classroom. Their results are in line with Mercer, Wegerif and Dawes' (1999) assertion that teachers should encourage reasoning that is made explicit during talk in school subjects. Nevertheless, while Mercer et al. (1999) argued that collaborative and effective dialogue implies that students are trying to reach an agreement, Schuitema et al. (2011) stated that future researchers should focus on the extent to which this finding applies to moral and citizenship education, since in this knowledge domain the plurality of perspectives and opinions is quite valuable. Democratic systems are plural by definition, and dialogism is determinant for citizens who consider and debate different perspectives. All these results are relevant in this thesis, because the dialogic stance and the quality of classroom conversation regarding citizenship are crucial to the current study.

Technology-use is also useful for teaching in CE. Technology serves the learning process by helping to make different perspectives explicit to the group and the teacher (Mercer, Hennessy & Warwick, 2017), and by supporting class dialogue and assisting participation (Rasmussen & Hagen, 2015). Wegerif (2007) argued that technology plays a unique role in supporting teaching and learning dialogues because technology can be set aside while people search for an answer through collaborative reasoning, which often happens when students work in groups around technology. In this project, teachers pause the videogame while students discuss what actions to take. This situation elicits a new kind of educational exchange, which Wegerif and Mercer (1996) called IDRF—"initiation-discussion-response-follow-up". Wegerif et al. (1998) developed a program called *Thinking Together*, designing lesson plans and technological activities for classes in several subjects such as science and CE. The directive structure of the computer-user interaction was combined with previous instruction concerning how to conduct exploratory talk. The researchers compared these experimental classes (119 children) with control classes (129 children). Quantitative analysis showed that children's learning achievements in the experimental group were higher. Wegerif, Mercer and Dawes (1999) showed that the use of exploratory talk could be taught to primary school children and that such talk improved group reasoning as well as individual reasoning skills, measured using a standard non-verbal reasoning test (such as *Raven's Progressive Matrices Test*). Rasmussen and Hagen (2015) studied an intervention whereby students used a microblogging app called

Talkwall, created by Rasmussen and Smørdal at the University of Oslo. The app allowed for users to write text information on tablets to prepare for whole-class discussion about a topic in history class. The students' microblogging was shared through a big-screen projection. In the classroom trajectories of participation (Rasmussen, 2005, 2012), Rasmussen and Hagen (2015) found that although the students' engagement had varied, technology did support whole-class discussion of the students' ongoing interpretations in reference to the shared microblogs.

Of particular interest for this thesis are studies of teaching designs that use game-like technology in CE. Studies show that, more than contributing to learning factual knowledge, some instructional gaming provides the achievement of more general educational goals such as high-order thinking skills and affective outcomes (Ke, 2009) and facilitates an improvement in students' perception of a connection between school content and life (Panoutsopoulos & Sampson, 2012). This is in line with CE learning goals. We know that technology impacts teaching designs (Guðmundsdóttir et al., 2014) and that this impact is subject-related: humanities teachers are more able than science teachers to create student-centered learning approaches when using technologies in class (Young et al., 2012; Karaseva et al., 2013). CE may thus be among the more "permeable" subjects in which GBL could be of interest.

Scholars have found the sociocultural aspects of gaming to be relevant in civic terms. Researchers examining the civic potential of videogames (how playing videogames relates to civic engagement) have found the quality of the collaborative activities used in GBL to be related to content knowledge. Lim and Ong (2012), for example, reported on the benefits of using a collaborative classroom context while using an educational videogame to promote a sense of citizenship among students. Raphael, Bachen and Hernández-Ramos (2012) found that students who experienced higher-quality collaborative learning presented greater flow in the game and achieved improved content learning about civic knowledge and argumentative skills than students who experienced low-quality collaboration in their groups. Westin (2009) argued that the use of interactive tools to foster active citizens is defective and "should be augmented with a suitable channel through which the actor freely can transmit ideas processed outside the interactive space" (p. 814). Felicia (2009) suggested that when sensitive themes are to be discussed, the characters and their actions in the game can be a point of departure for debate. Furthermore, teens who play games socially tend to engage more in civic matters than those who play alone (Kahne, Middaugh & Evans, 2009). From a sociocultural perspective, this offers a very rich scenario for studying how dialogic stances evolve as a learning process—an opportunity taken by the present study.

The combination of dialogic methods and technology seems to be of particular importance. The use of technology for teaching is more effective if framed by a dialogic stance (Juzwik, Dunn & Johnson, 2016). Digital tools, when embedded in a dialogic pedagogy, create a "dialogic space" and provide valuable support for improving classroom interactions and the co-construction of new understandings (Wegerif & Mercer, 1996; Wegerif, Mercer & Dawes, 1998; Chee, 2011; Rasmussen & Hagen, 2015). Wegerif et al. (1998) showed that learning benefited from combining technology with exploratory talk in CE. He created a software program called *Kate's Choice*, which provides children with an interactive narrative with a citizenship focus. The software presents moral dilemmas and was designed to elicit exploratory talk. Children who have been taught and have previously appropriated ground rules for exploratory talk posed more task-focused questions, gave reasons for their statements,

considered several positions before making a decision, elicited opinions from everyone in the group and reached agreement before acting. In contrast, children in the control groups spent much less time on each decision, made more arbitrary decisions and usually accepted the choice of the most dominant child without debating the alternatives (Wegerif et al., 1998). Dialogue helps students to make sense of GBL and interpret a game in relation to what they already know about a topic (Egenfeldt-Nielsen, Smith & Tosca, 2008), and it is key to promoting an open and critical disposition toward the process of knowledge construction (Chee, 2011; 2016).

Despite frequent references to the importance of dialogue in GBL, few empirical studies have provided details of the interactional processes involved in these learning trajectories (Egenfeldt-Nielsen, Smith & Tosca, 2008). For example, Nash and Shaffer (2011) followed middle-school students that were mentored by undergraduate students as they played an educational epistemic videogame about urban planning. They concluded that the interaction between students and mentors was crucial to the development of epistemic frames but do not clarify these results in terms of learning trajectory. Also, Barab and Squire (2004) followed a case using the COTS game *Civilization* in a world-history class and analyzed social interactions, finding that the teacher's role was essential to link the game to the curriculum; however, none of the studies clarify the appropriation of the game and meaning-making over time.

Among the few studies detailing interactional learning processes in GBL, I denote Silseth (2012) who used a sociocultural approach to analyze dialogic aspects of collaborative GBL in terms of unfolding learning trajectories. He followed a class that used an educational videogame to learn about the Israel/Palestine conflict. Besides gameplay in pairs, students received an introductory lecture, watched documentaries on YouTube and had plenary discussions. To analyze the class dialogues, Silseth used thematic analysis of social interaction inspired by dialogic principles to consider (1) the joint construction of meaning and (2) the sequential and activity interdependence of the dialogue. His study recognized learning as a trajectory in which interaction and context are dynamic processes. The students' perspectives on the studied topic have changed throughout the course of the activity. He concluded that meaning-making was an interactional and situated accomplishment, chronologically unfolding. His study, which illustrated how the game was constituted as a learning resource, concluded that the following were important:

- the teacher helping students to make sense of the task by reorienting them and revoicing their perspectives while maintaining ownership;
- the crossing of cultural resources from both inside and outside the classroom (e.g., students invoking out-of-school game experiences while trying to consider the game as a learning resource).

Silseth reflected on the importance of considering multiple perspectives in the development of thinking skills. He described how interactions and dialogue in GBL bring together different perspectives (termed *voices* in the dialogic tradition) by analyzing classroom interactions, to mirror what he called the *multivoicedness* of gameplay. Each voice is a view of the world that a person would typically advocate (Linell, 2009). Different voices in a dialogue not only add to one another but also inter-animate one another. Silseth (2012) studied how this multivoicedness created a dialogic space for meaning-making trajectories during GBL. By focusing on the trajectory of learning over time and the unfolding processes of dialogic reasoning, he concluded

that the teacher's role was important and that mobilizing broader aspects such as a multiplicity of voices in a dialogic sense was determinant for the GBL experience.

According to Bers (2010), in order to understand the potential of the gaming experience with respect to civic engagement, it is crucial to understand not only the design aspects and features of the game that may encourage civic engagement, but also the social context of videogame play. Studying GBL that occurs in a collaborative way, like Silseth has done, is then relevant because the sociocultural interactions that occur may be extremely important to a better understanding of the phenomenon under examination. This thesis follows the same trend and discusses the nature of videogames as educational tools in relation to the contextual and social-interactional aspects of GBL situations. However, the students in Silseth's study addressed the differences between the educational game in use and other popular COTS videogames they were familiar with from out-of-school contexts. Since these differences can elicit the engagement issues discussed earlier, the present study seeks to expand on this approach by studying GBL using a COTS game instead of an educational one.

4. Methodology and research design

This chapter describes the design and implementation of the research project. It clarifies the research questions and describes the empirical contexts and data collection process, as well as the later analytical work. The chapter also includes reflections on how methodological quality was ensured and discussions of relevant ethical issues within the research process itself.

4.1. Research questions and research design

The research design was informed by previous literature and preliminary exploratory fieldwork, including informal class observations and a pilot study.

During late 2013, I informally visited several schools in Oslo to become familiar with the use of technology in the Norwegian educational context. I developed informal class observations and established informal conversations with teachers and students. From these conversations arose the importance of including a focus on the students' engagement and the teachers' role in the current study of GBL. During one visit I informally observed GBL in action, where *Minecraft* was used in a history class. I realized that GBL was very time-consuming and that engagement in activities was very dependent on the students' previous expertise in controlling the game. These aspects were important when considering the further design of the present study.

As I was participating in a game forum promoted by the Norwegian Centre for Information and Communication Technologies in Education, in Oslo, in October 2013, I heard different opinions from teachers who had used GBL, and I met a Norwegian teacher who was using a COTS videogame to teach ethical theories in an upper secondary school in Bergen. This preliminary contact led to an initial pilot study in his classes and to the later formal participation of this teacher in the present research study.

The pilot study inspired and enriched the later research design. The pilot study followed the teacher mentioned above, who taught the class "Christianity, Religion, Philosophies of Life and Ethics" in three different classes attending the last year of secondary school in Norway, for a total of 9 hours. The observed classes followed the same GBL activity that would later be used in the main study. I also conducted informal observations of the classes, informal conversations with the participants and interviews with the teacher, the school principal and some of the students. Preliminary considerations from these observations and the participants' input were noted and considered in the main study. For example, the interviews provided the information that some of the students perceived GBL as useful for learning both about the school curriculum and about real life. This inspired the interview scripts for the main study (interview scripts appear in Appendices 1 and 2). I also observed that the use of different kinds of classroom practices—such as small-group discussions and whole-class debates—was helpful for acquiring interesting interactional data; the study of instructional design in GBL is dealt with in detail in Article II. I realized that using a game-like app for voting captured students' involvement, and I wondered about the possibility of creating four possible answers that matched the given ethical theories. I also noticed that long, small-group discussions and long periods of gameplay (when a single student was playing and others were passive observers) led to less student focus. This made clear to me the need to study students' engagement during

GBL, which is examined in Article III. The main purpose of the present thesis is to understand what characterizes the studied GBL practice as a trajectory for learning about ethics and morals. As mentioned in the introduction chapter, the study poses as main research question:

How do GBL educational designs for learning ethical theories mediate students' collaborative thinking and meaning-making?

The research design was conceived to answer this overall research question. As mentioned, it included following two upper secondary classes—one in Portugal and one in Norway—while learning a content unit about ethics and morals, in a citizenship education course. The classes collaboratively played a COTS videogame named *The Walking Dead* and were invited to make choices about five moral dilemmas presented by the game narrative. At each moral dilemma presented, the teachers in both countries paused the game and encouraged collaborative and reflexive class discussions about the game dilemma in relation to various ethical theories from the subject curriculum. Then, the students followed these discussions by individually voting (using the apps *Kahoot* or *Geddit*) about what to do in the game. They made use of the game's interactivity to apply the decisions taken, and thus influence the game plot. The described GBL practice was already occurring in the Norwegian setting and was then introduced to and freely adapted by the Portuguese teacher. The research design was slightly different in both cases, with the Portuguese case being closer to a designed intervention. In this case, the Portuguese teacher was introduced to the technology and the practice, by the researcher, who also assisted in operating some of the technological equipment. However, this did not significantly interfere with data collection, neither did it represent implications for implementation and further analysis in the present research.

The study adopts a sociocultural and dialogic approach with a focus on students' collaborative reasoning and the teachers' enacted designs and is thus focused on analyzing the mentioned collaborative and reflexive class discussions. To better explore the main question, several more specific research questions were posed and explored in three different articles. First, I intended to understand and reveal the main collaborative reasoning processes of meaning-making underlying the class dialogues. With this intention, in Article I, I posed the following research question (RQ):

RQ1: "How do students using a commercial videogame in citizenship education collaboratively reason while learning about ethics and morals?"

Next, I wanted to clarify how the dialogic integration of several mediational resources contributed to GBL. Namely, I focused on how the different instructional designs, enacted by the two teachers, facilitated the learning experience to become transformative from a learning point of view. With this aim, in Article II, I posed the following research questions:

RQ2: "How was the commercial videogame integrated with other educational resources by the teachers in the two classrooms?"

RQ3: “What kind of positioning work, key to transformational play, was accomplished through the teachers’ dialogic interactions and the enacted learning designs?”

RQ4: “In which ways did the teachers’ dialogic interactions support meaning-making in citizenship education and ethics?”

Finally, Article 3 aimed to uncover how engagement issues played a part on the learning trajectory, namely how dialogic approaches within GBL contributed to position students in ways that engaged students in a productive disciplinary matter. To investigate this, I posed the following research questions:

RQ5: “What characterized the teacher’s educational design, and how did it foster students’ engagement beyond the game?”

RQ6: “How did the students make sense of the ethical theories during the curriculum unit?”

4.2. Empirical context and data collection

4.2.1. The schools

Including two case studies in two different countries has enriched this thesis with data from different cultural settings and different realities in terms of technology use at school.

The school in Norway was chosen for participation after the pilot study. I discovered that the mentioned GBL practice had been in place there for roughly three years, leading to both an enthusiastic attitude on the part of the students (who had also previous GBL experiences in other subjects) and a positive self-evaluation of the teaching results. I observed very helpful support from the school community regarding the mentioned practice.

Interviews with the students, the teacher and the principal revealed that the school implemented innovative teaching practices and believed in learning through collaboration. The school wished to create global citizens who have principles and values and a democratic vision of the world. Technology was considered essential, and laptops and smartphones were commonly used during classes. All the classrooms I visited were equipped with technological resources for teaching. Innovative ways of thinking were appraised when recruiting teachers, and the teacher corpus was very young and “digitally minded”. This situation led to initial criticism from parents and the local media, when the school opened in 2010; for instance, they reacted to the absence of physical books at the school. In time, however, people started to appreciate the innovative techniques in use at the school. Now other schools visit to learn how to implement these educational practices, and the school often presents its practices at international meetings, where teachers and students alike deliver presentations. The practice examined in this thesis has been recognized by national educational bodies and local and international media, including television, newspapers and cyber blogs in different languages and different countries across the world; examples include online publications in the United States, Great Britain, Portugal, Brazil, Mozambique, Spain, Mexico and Italy, among others. On 18 December 2020, a Google search combining the name of the teacher and the name of the videogame provided around 34,500 results, mainly referring to the practice described. Even the

prime minister of Norway showed appreciation for the work developed at the school and the Norwegian minister for education has referred to the GBL practice in a short tweet.

Considering the favorable (and unusual) milieu I encountered at the Norwegian school, I designed my study to include another case study. I asked previous professional contacts in Portugal to recruit a school because I was familiar with the incipient use of technologies in Portuguese secondary schools. This option allowed me to immediately start processing data in my native language, thus overcoming the limitation of my (at the time) rudimentary Norwegian. Extending the research to a transnational scope also seemed especially pertinent, considering the worldwide interest in GBL and the generalized use of videogames. My research design has no comparative intention, however, since the study treats the two cases as contrasting cases, thereby enhancing the study by including different realities that reveal the use of GBL in different educational styles and school cultures.

The Portuguese school enrolled in the study is an upper secondary school oriented toward vocational education. The school embraced this project as an innovative opportunity to engage unmotivated students. The school's regular classrooms have no technological equipment. Only the classroom used for ICT classes was equipped with an interactive whiteboard, and most teachers in the school were not qualified to use it. The majority of students did not own smartphones, and most Portuguese teachers at secondary schools, as of 2020, do not allow students to use personal laptops in class. Despite recent investments in technological equipment, none of the computers at the Portuguese school had enough internal memory to run the videogame, which had to be played through an additional computer brought in by the researcher. In contrast to the Norwegian case, the Portuguese school community had no previous experience of GBL. In contrast to the favorable milieu found at the Norwegian school, the GBL practice was here seen as unusual and not so valuable.

4.2.2. The school subjects

The class subjects followed in this study were "Christianity, Religion, Philosophies of Life and Ethics" (in Norway) and "Integration Area" (in Portugal), which were chosen because they included curricular content regarding citizenship, ethics and moral reasoning. As mentioned before, the overarching goals and topics of CE have many commonalities worldwide, despite the diversity of curricular content and teaching practices (Schulz et al., 2018). These topics include: being informed and critically literate; being socially connected and respectful of diversity; and being ethically responsible and engaged (UNESCO, 2015).

According to the Norwegian Directorate for Education and Training (2006), the goal of secondary education is to prepare students for life in society and further education, which includes assisting personal development by analyzing values such as freedom, tolerance, human rights and equality. Norway's Upper Secondary Education Act also expresses the need to consider youth culture within educational practices. Social relations among the pupils and the values embedded in the youth culture are integral parts of the learning environment. As regards the teacher's role, the act also states that good teachers have a sure grasp of their material and know how it should be conveyed in order to kindle curiosity, ignite interest and win respect for the subject.

In Norway, citizenship education at secondary schools is distributed among several subjects, the foremost being "Social Studies" and "Christianity, Religion, Philosophies of Life

and Ethics" (known as KRLE from the Norwegian name, "Kristendom, Religion, Livssyn og Etikk"). Both include ethics, but Social Studies uses ethical perspectives in a broader way that deals with duties and responsibilities in social and cultural participation, while KRLE focuses more on philosophical models and their applications as tools for analyzing and reflecting on ethical challenges. KRLE curriculum states as a goal that "as a subject aiming to raise awareness and shape attitudes, religion and ethics shall also open for reflection on the pupil's own identity and … choices in life"; the curriculum also states that teaching will "stimulate each pupil to interpret life and attitudes" (Norwegian Directorate for Education and Training, 2006, p. 2). The main skills it proposes be achieved in the subject include "being able to listen and formulate ideas in conversations and dialogues … formulating knowledge and reflections … interpreting and reflecting … understanding issues, covering arguments and identifying main points of view … [and] … being able to use sources with considered judgement and displaying ethical judgement when using digital tools" (Norwegian Directorate for Education and Training, 2006, p. 3). The curricular content is divided into four subject areas, as shown in Appendix 3. The fourth area, called "Philosophy, ethics and views on life/humanism", directly relates to the practice studied, as the intention is to investigate how ethical concepts and argumentation models form the basis for making one's own opinions and choices. Among the topics included in this unit is a direct mention of what the students are taught during this study: to "explain some key ethical concepts and argumentation models and recognize and assess different types of ethical thinking", "discuss similarities and differences between the various approaches", and "conduct dialogues with others on relevant ethical questions" (Norwegian Directorate for Education and Training, 2006, p. 5). This last point expresses well the importance that the Norwegian system places on promoting students' critical and independent thinking (rather than the much less valued capacity of defending one's own point of view or simply mastering factual knowledge). For this last point, Norwegian students scored above average in ICCES 2016 (Schulz et al., 2018).

In Portugal, the subject Integration Area (known as AI from the Portuguese name, Área de Integração) was created in 1990 as part of the sociocultural component of training curricula for vocational schools. The intention is for AI to provide an understanding of the contemporary world by using a cross-disciplinary gathering of knowledge. The program simultaneously: (1) favors the acquisition of knowledge derived from the social sciences and from philosophical reflection and (2) promotes students' development of enabling skills for insertion in society and a transforming labor market. AI embodies a set of proposals, based on scientific and cultural contexts, for students to develop curiosity, initiative, creativity in finding solutions, responsibility for the implementation of projects and a sense of cooperation in the sharing of processes and products. The Portuguese curriculum is less focused on religious matters, but, just as in the Norwegian case, it refers to the use of ethical theories as a philosophical frame for analyzing moral actions in a societal context. The whole program is structured in three main areas, as shown in Appendix 3. From the program, each school freely chooses six out of nine thematic units (each including several problem-themes) to be taught during the three years that constitute secondary school in Portugal. The present case study followed a class that learned about Problem-theme 9.1 (ethics) in relation to Problem-theme 5.2 (European citizenship). The goals for Problem-theme 9.1 include "debate on the concept of freedom in its different meanings" while students "meet the ethical and political foundations of society" and "the direct

and implicit influences of those values" (Portuguese Ministry of Education, 2004, p. 74). Interestingly, the same document suggests the use of narrative-based activities for teaching, such as watching movies or performing dramatized readings of plays that may address decisions using ethical fundamentals. The classes I followed in both Norway and Portugal were thus about learning ethical theories, but since the classification system for ethical theories is not agreed upon within the field of philosophy (Vestøl, 2004; Bonde & Firenze, 2013), the way they were presented in each country was slightly different owing to the options available, the textbooks they chose and the teachers. Appendix 4 presents the theories taught in both countries that were relevant to my studies.

4.2.3. The participants

The two teachers were directly invited to participate in the project, and they chose which classes to involve. In the Norwegian case I followed two classes, and in the Portuguese case I followed one class. Because of the technical constraints I encountered with video recordings, only one of the Norwegian classes is considered in the present thesis. The Norwegian class was composed of 26 students (20 boys and 6 girls aged 17–19) in the third year of regular upper secondary school. The students were from the middle to upper socioeconomic class in the suburbs of a large city in Norway. The teacher, who was in his late 20s, commonly used technology in his teaching. He was a gamer, and he designed the GBL practice for his class. The participating students also had previous experience of GBL in various subjects, including the videogames *Civilization*, *Skrym* and *The Last of Us*.

The Portuguese class was smaller (5 boys and 9 girls aged 18–22) and consisted of struggling students in the second year of upper secondary vocational courses. This Lisbon school primarily serves students who face socioeconomic constraints; the age range of the class was increased by difficult school trajectories, including retentions, lack of motivation, disciplinary problems and temporary drop-outs. The Portuguese teacher, who was in her 50s, was unused to technology-enhanced teaching practices. She decided to participate in this study to explore GBL as an innovative pedagogical method that could combat the students' motivation problems. The participating students from Portugal had no experience of GBL and were very enthusiastic when presented with the idea of using videogames in the classroom.

4.2.4. The videogame

Attempts to define what constitutes a videogame (e.g., Salen & Zimmerman, 2004; Esposito, 2005) often refer to a fictional, unpredictable and unproductive activity that is dominated by rules, time and space limitations, and is voluntary, fun and stimulating (Griffiths, 2002). Moreover, researchers have yet to reach a consensus on how to categorize different types of videogames (see Newman, 2004; Apperley, 2006). While acknowledging the diversity of videogame types, and also recognizing their differentiated potential as mediational tools for learning, this study's empirical scope is limited to a particular videogame. Both teachers used the same videogame, *TWD*, which is a commercial videogame with an episodic format developed and published by Telltale Games (2012). It is based on a comic-book series of the same name. The game consists of five episodes that were released at two-month intervals between April and November 2012 and are available for several game platforms. The first two

seasons were a commercial success, having sold more than 28 million episodes during the game's first two years on the market (Ohannessian, 2014). The game, which has received critical acclaim and has won several awards, has been widely applauded for the emotional tone of the story and the empathetic connection that is established among the main characters. Unlike other adventure games, *TWD* does not stress puzzle-solving but instead focuses on story and character development. It is a role-playing game that is played from a third-person perspective. The players interact with their surroundings and determine the nature of these interactions; for example, they can choose to talk to, look at or ignore other characters or pick different actions or dialogue options. Several options related to actions or dialogue lines are displayed on the screen for players to choose, as shown in Fig. 3.

Fig. 3. Screenshot of TWD game, with speech options for the player to choose from.

Most of these choices are not clearly good or bad but rather ambiguous. For example, they might affect the attitude of the non-player characters toward the main character. However, some of these choices, as explained in the introduction section, require players to make significant decisions that may affect the game's unfolding story. They are designated in this thesis as *moral dilemmas*. In the present project, the teachers used the first episode of the game, which contains five of those moments.

The plot starts with the main protagonist, Lee, an African American man and former university professor, being taken to jail after being convicted of killing his wife's lover. A zombie apocalypse suddenly unfolds, and the police car Lee is in crashes, allowing Lee to escape. He takes shelter in a nearby home, where he discovers an eight-year-old girl named Clementine whose parents have disappeared. Lee takes care of Clementine, and soon they join a small group who together need to somehow survive the cataclysm (both characters are represented to the right in Fig. 3.) They travel to a farmstead, and when the owner (Hershel) starts questioning Lee about his past, he has to decide whether to tell the truth or to lie, and this corresponds to the first moral dilemma in the game. The next morning, Lee is introduced to a couple and their little boy, Duck (Duck's father is represented to the left in Fig. 3.) Suddenly both little Duck and Hershel's grown son (Shawn) are simultaneously attacked by zombies, and Lee must decide which one to help (2nd dilemma). After leaving the farm the group finds shelter in a drugstore, where they meet other survivors. One wants to send little Duck away, suspecting

that he has been bitten, and Lee must decide whether to agree with that action (3rd dilemma). Later, a group member named Glenn leaves to find supplies but is soon surrounded by zombies and needs to be rescued. Lee departs to help him, accompanied by another group member named Carley. After helping Glenn, they learn that a woman is also in danger. Glenn wants to attempt to save this stranger as well, but Carley vehemently opposes the risk this would involve. Lee must decide what to do (4th dilemma). The woman, however, was already bitten by a zombie and is already infected. Lee must then decide whether to loan her a gun to help her commit suicide in accordance with her own will (5th dilemma).

This game was not created for educational purposes, but, as said before, it was chosen for use in this study for its ability to enhance discussion about interesting topics. *TWD* offers an open narrative and difficult moral dilemmas, which present particularly interesting opportunities for teaching ethics. The short-episode format makes it compatible with the class time frame, since it does not require long hours of gameplay before interesting dilemmas arise. Players around the world play the videogame, and it presents dilemmas that can be seen as universal (such as to lie or not to lie), reinforcing its relevance to testing of this activity across countries in the current project. The teachers also used other game-like apps (*Geddit* in Norway and *Kahoot* in Portugal) to collect students' opinions at key moments.

4.2.5. Class activities

As mentioned before, in both cases—in Portugal and in Norway—the teachers used the same videogame to teach a content unit about ethics. The goal was to have students discussing and learning ethical theories. While GBL was a common practice in the Norwegian school, it was not at all common in the Portuguese case. The Norwegian teacher was also much more accustomed to technological-learning environments in general, compared to the Portuguese one.

Due to differences in the subject curricula, the ethical theories presented in each country were not identical. Appendix 4 summarizes the theories as presented in each country. An important distinction was also the way the teachers presented these theories. While the Portuguese teacher opted for presenting all the theories before starting the game activity, the Norwegian teacher opted for presenting one theory at the time—at each game pause, he presented the theory he believed would best fit the discussion of that particular dilemma. Resources in use were also different, with the Portuguese teacher using printed handouts and the Norwegian teacher using PowerPoint slides. The Norwegian teacher moved at a fast pace between several technological tools, while the Portuguese teacher—who was not used to operating technological tools in class—required some assistance from the researcher. However, both teachers opted for pausing the game at the same moments and used the same game dilemmas as discussion starters.

- Dilemma 1 - To lie or tell the truth about our past to someone helping us?
- Dilemma 2 - To rescue a child or an adult, both simultaneously attacked by zombies?
- Dilemma 3 - To throw outside (to zombies) or keep safe a child under the suspicion of having already been bitten by a zombie?
- Dilemma 4 - To risk ourselves to try to save a stranger surrounded by zombies?
- Dilemma 5 - To help someone already bitten to commit suicide to prevent their becoming a zombie?

As seen, the free adaptation of GBL to personal teaching styles and curricular goals led to different teaching designs. A more detail description of the developed activities in each country now follows.

4.2.5.1. Class activities in the Portuguese case

After learning from the researcher about the GBL practice created and implemented by the Norwegian teacher, the Portuguese teacher adapted the practice to her goals and conceived a personal organization for the class activities. Table 1 summarizes how activities were implemented by the teacher in the Portuguese class over 4 weeks. The data collection also included one week of previous preparation and one week of conducting post interviews.

Table 1. Organization of class activities in the Portuguese case.

<table>
<tr><th>Lesson 1
(90 minutes)</th><th>Lesson 2
(45 minutes)</th><th>Lesson 3
(45 minutes)</th><th>Lesson 4
(90 minutes)</th><th>Lesson 5
(90 minutes)</th><th>Lesson 6
(45 minutes)</th><th>Lesson 7
(90 minutes)</th></tr>
<tr><td rowspan="3">Theoretical introduction to the unit of study</td><td rowspan="3">Theoretical introduction to the unit of study</td><td rowspan="3">Theoretical introduction to the unit of study</td><td rowspan="2">Videogame play</td><td>Videogame play</td><td>Videogame play</td><td>Videogame play</td></tr>
<tr><td>Debate 2 + voting</td><td>Debate 4 + voting</td><td>Debate 5 + voting</td></tr>
<tr><td>Debate 1 + voting</td><td>Debate 3 + voting</td><td></td><td>Plenary discussion about the activity</td></tr>
</table>

*Officially the lessons were 45 minutes or 90 minutes; however, they rarely started on time, so GBL activities in the seven lessons lasted, respectively, 77, 36, 29, 90, 81, 31, and 84 minutes.

Using reading-comprehension activities and short IRF sequences, the teacher used three entire lessons and the initial part of the fourth to introduce the activity and curriculum content. She narrowed the discussion down from European citizenship to definitions of ethics and morality, and finally presented the three ethical theories. During this initial part of the learning trajectory the students were seated at their desks, and they used handouts provided by the teacher as their primary resource. These handouts included copies from textbook pages (about Europe and participatory citizenship) and a summary of the three ethical theories the teacher had written and adapted to the class profile. Fig. 4 shows the organization of activities during these three lessons (henceforth called Part 1).

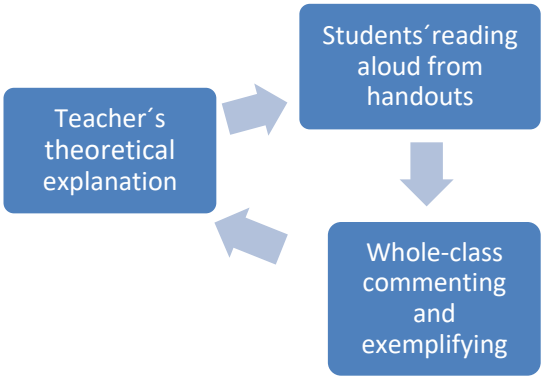


Fig. 4. Cycle of activities implemented in Lessons 1 through 3 in the Portuguese case (Part 1).

Class activities included the teacher addressing key ideas about a topic using dialogue and then asking one student to read aloud a short excerpt from the handouts. Students were then asked to re-explain what they read in their own words, to add some comments, and were provided and asked for concrete examples, as shown in Fig. 5a. During the four lessons that followed, the students collaboratively played the game (the actions of which were projected on a big screen) and took turns with the game control, see Fig. 5b.

a **b**

Fig. 5a/b. ***5a****: The Portuguese class discussing handouts during Part 1;* ***5b****: Students during gameplay; the second girl on the right holds the game control while the other students follow the action on the big screen.*

Whenever the game presented a moral dilemma, the teacher paused the game and led class discussions. During the pauses—which corresponded to the first three dilemmas in the game (Lessons 4 and 5, henceforth called Part 2)—discussions were led in accordance with a very open format. The students were simply invited to freely express their opinions, as represented in Figs 6a and 6b.

a **b**

Figs 6a/b. ***6a****: Portuguese students during whole-class debate in Part 2;* ***6b****: Students celebrating after learning the voting results*

During these long open format whole-class debates, the students actively exchanged arguments among themselves and with the teacher, who actively prompted them to establish connections between the game dilemma and the given ethical theories and/or real-life situations. After long debates, the students used desktop computers to individually vote on what to do in the game, using *Kahoot*. Fig. 7 is a schematic of how the activities took place during Part 2.

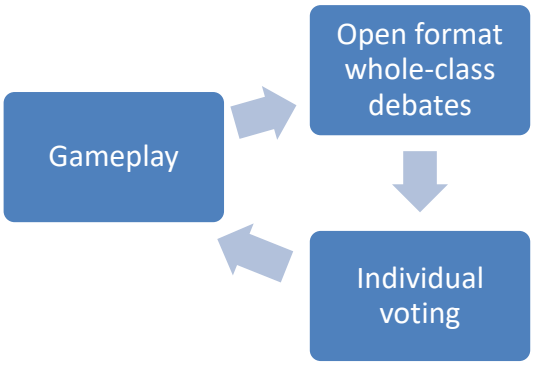


Fig. 7. Cycle of activities implemented during Lessons 4 and 5 in the Portuguese case (Part 2).

During Lessons 6 and 7 (henceforth called Part 3), the teacher invited small-group discussions during the pauses that corresponded to the last two dilemmas. The class was divided into three small groups, and each group was given the task of defending one specific ethical theory. The organization of the groups was spontaneous, but the teacher ensured that the students would experience defending different theories in each debate. Fig. 8 represents the organization of activities during Part 3.

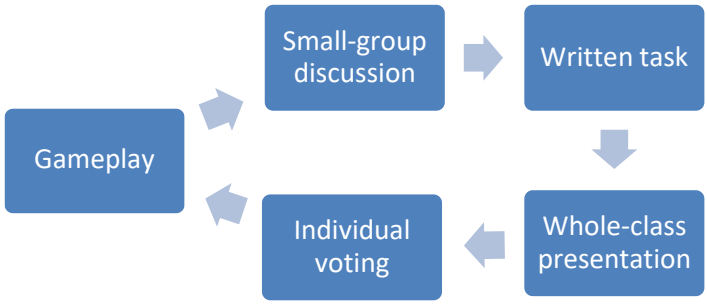


Fig. 8. Cycle of activities during Lessons 6 and 7 in the Portuguese case.

The small groups wrote down their arguments regarding possible choices in the game, considering the particular pre-assigned point of view (Fig. 9a), and they later presented their arguments to the class. At the end of the project (henceforth called Part 4), the teacher organized a plenary debate about the GBL activity, in which participants reflected about the learning possibilities, particularly in connection with the real-life context, as shown in Fig. 9b.

a **b**

Fig. 9a/b. ***9a****: The teacher and students engaged in small-group discussions during Part 3, using handouts;* ***9b****: Plenary discussion during Part 4.*

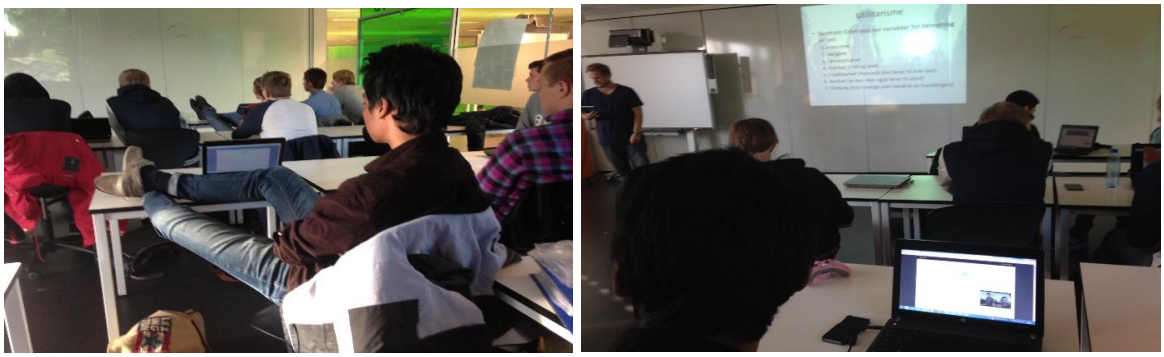
4.2.5.2. Class activities in the Norwegian case

The Norwegian class was followed during the equivalent gameplay and same five dilemmas, although in Norway these factors only took two lessons of 120 minutes each. Table 2 illustrates the distribution of the activities in the Norwegian lessons.

Table 2. Organization of class activities in the Norwegian case.

Lesson 1 (120 minutes)	**Lesson 2 (120 minutes)**
Brief theoretical introduction and explanation of GBL. Alternation of the following activities: • Gameplay • Theoretical explanation • Small-group work (Dilemmas 1 and 2) • Whole-class presentations	Alternation of the following activities: • Gameplay • Theoretical explanation • Small-group work (Dilemmas 3, 4, and 5) • Whole-class presentations

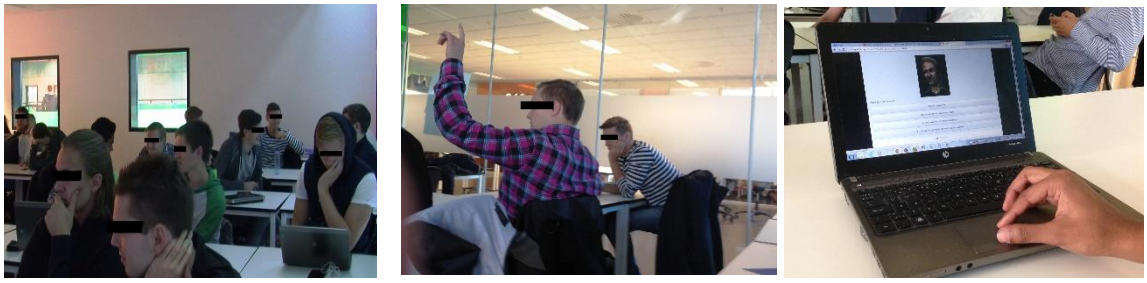
The Norwegian teacher introduced the activity, briefly lectured about general concepts on ethics and morals, and started gameplay after only 38 minutes (Fig. 10a). He started each game pause by presenting the ethical theory that he assumed was best for discussing that particular dilemma (Fig. 10b). These brief theoretical explanations (normally less than 5 minutes) used expositive methods and PowerPoint slides as well as brief IRF exchanges and small-group discussions.



a **b**

Fig. 10a/b. ***10a****: Norwegian students during gameplay;* ***10b****: The Norwegian teacher presenting an ethical theory during a game pause.*

After the theoretical explanation, the students were instructed to use that particular theory to discuss in small groups what to do in the game (Fig. 11a). At times, the teacher used *Geddit* to collect students' comments or self-evaluations on their understanding of the topic. Group discussions were usually short—usually under 5 minutes—and were followed by some of the students presenting their conclusions to the class, as seen in Fig. 11b. Finally, they used personal laptops or smartphones to vote for their individual choices (Fig. 11c). The extensive use of technology allowed for an accelerated pace, with the class frequently switching tools and moving through activities. After the initial introduction, the teacher organized the activities and adhered to a homogenous pattern throughout the project, as represented in Fig. 12.



a **b** **c**

Fig. 11a/b/c. ***11a****: Small-group discussion of a game dilemma in the Norwegian class;* ***11b****: Whole-class presentations after small-group discussions;* ***11c****: Using smartphones and laptops to vote.*

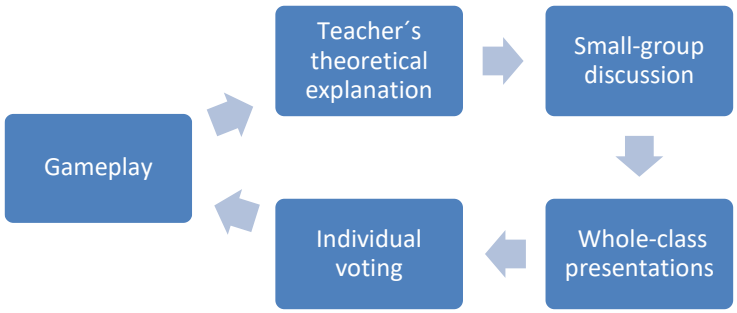


Fig. 12. Cycle of activities implemented during lessons in the Norwegian case.

Table 3 summarizes the total time used in each activity in both settings.

Table 3. Time spent with class GBL activities in the two case studies.

	Portuguese case (428 minutes)	**Norwegian case (227 minutes)**
Theoretical explanations	143.5 minutes (33.53%)	48 minutes (21.15%)
Instructions for GBL activity	20.5 minutes (4.79%)	12 minutes (5.28%)
Gameplay	138.5 minutes (32.36%)	86,5 minutes (38.11%)
Open format whole-class debates	60 minutes (14.02%)	The teacher did not use this format
Small-group discussions	31 minutes (7.24%)	34,5 minutes (15.20%)
Group presentations to the class	17 minutes (3.97%)	25 minutes (11.01%)
Use of additional digital apps/voting	17.5 minutes (4.09%)	21 minutes (9.25%)

4.2.6. Data collection

All social qualitative research is founded on the human capacity for participant observation and seeks to provide descriptive accounts of determined sociocultural realities. This study's research design adopts several methods from ethnographic observation. It aims to describe the observed phenomenon as it is, not merely how the researcher perceives it to be nor how they would like it to be (Hammersley & Atkinson, 2007). For example, the study has taken place in natural settings, focuses on only a few cases, and the data is collected from different sources (based on watching, listening and asking questions), mainly with the intention of gaining access to the meanings that guide the observed behavior. Also, the present study describes "what happens, how the people involved see, and talk about, their own actions and those of others, the contexts in which the action takes place, and what follows from it" (Hammersley & Atkinson, 2007, p. 7).

The first data collection was performed in Portugal during the spring of 2014, and the second took place in Norway during the autumn of 2014. Before each data collection activity, work was conducted to prepare research material and have meetings with the teachers. Class observations took place from the beginning of a content unit until the students encountered the first five dilemmas presented in the videogame. I was the lone researcher from University of Oslo on site and took extensive field notes, collected the descriptive ethnographic data and observed the class activities.

4.2.6.1. Data collection in the Portuguese case study

The Portuguese fieldwork lasted six weeks, including one week of preparation, four weeks of observation (seven lessons) and the final week of conducting post-interviews. As mentioned, the lessons usually started later than scheduled, which significantly shortened the lessons' scheduled duration of 45 or 90 minutes. Table 4 summarizes the fieldwork in the Portuguese case.

Table 4. Organization of fieldwork in the Portuguese case.

<table>
<tr><th>Week 1</th><th colspan="2">Week 2</th><th>Week 3</th><th>Week 4</th><th>Week 5</th><th>Week 6</th></tr>
<tr><td rowspan="2">Preparatory meetings with the teacher</td><td>Presentation of the research project and signing consents</td><td rowspan="4">Class observation (1 lesson)</td><td rowspan="4">Class observation (2 lessons)</td><td rowspan="4">Class observation (2 lessons)</td><td rowspan="4">Class observation (2 lessons)</td><td>Interview with the teacher</td></tr>
<tr><td rowspan="3">Questionnaire on videogame habits and moral issues</td><td>Interview with the students</td></tr>
<tr><td rowspan="2">Setting up and testing of technical equipment</td><td>Interview with the principal</td></tr>
<tr><td>Interview with student union</td></tr>
</table>

During the preparatory meetings, I introduced the teacher to the videogame and practice. We discussed the project in relation to her pedagogical and curricular goals. Accessing a projector and individual computers involved moving the class to the only classroom equipped with such technology. Any technical limitations had to be corrected by the school technology support team, which stressed the general lack of technology-supported learning practices in the Portuguese case. As mentioned, the research design was different in the Portuguese case: even though the observation of the class activities was non-interventive, I myself had to operate the technological resource, which was unfamiliar to the teacher; this involved running and pausing the game, teaching students how to use the remote control, etc. The positioning of the camera was limited to the best single site for capturing the whole class. In the last session, the projector lamp was too weak to provide enough visibility, so the students had to sit around the computer screen to follow the game action.

The post-interviews with the teacher and 12 students clarified aspects of the implementation and participation in the project, provided additional ethnographic information, and added perspectives regarding the ethical aspects of commercial videogames and the use of games for learning. These interviews—which were conducted both in Portugal and in Norway—contributed to better characterize the school setting, namely they have clarified the teacher and students´ previous experiences with GBL, their attitudes towards this practice, and the way they perceived videogames as useful tools to reflect about moral and ethical issues in relation to real life. Interviews with the principal and student-union board were also conducted, so as to gather additional ethnographic data on the school population and environment, educational strategies and, in particular, perceptions of access to technology and its use within the school context. Table 5 shows the data corpus from the Portuguese case study.

Table 5. Data corpus in the Portuguese case study.

Type of data	**Description**
Video records	487 minutes of video records from one fixed camera (corresponding to 428 minutes of GBL activities). The video recordings captured the whole-class activities during the 7 lessons and focused on focal groups during small-group work. These data function as primary data.
Field notes	Notes taken by the researcher during the fieldwork, registering the key events that occurred during particular interactional aspects.
Audio records	256 minutes from semi-structured interviews with the teacher and 12 students (interview scripts appear in Appendices 1 and 2).
	166 minutes of non-structured interviews with the principal and student union board.
Pictures	Pictures from the class activities.
Documents	Copy of the theoretical handouts provided by the teacher.
	Students' document productions: written work assignments.

4.2.6.2. Data collection in the Norwegian case study

Data collection in Norway took two weeks, followed two classes (designated in this thesis as 3A and 3B), and was performed in collaboration with a master's student from the University of Bergen (Stig Andreassen) whose master's thesis is also on GBL (Andreassen, 2015). The unexpected presence of journalists and various sound-capture problems prevented data from Class 3B from being included in this study. The observation of Class 3A covered two lessons over the two weeks. The students had one lesson per week lasting 120 minutes each. The observation of activities was naturalistic and non-interventional and took a total of 239 minutes. The width of the classrooms made it difficult to capture the entire class when the students were seated at their desks. The students working in small groups were captured in more detail by a second camera and a secondary table microphone. Table 6 summarizes the fieldwork in the Norwegian case.

Table 6. Organization of fieldwork in the Norwegian case.

<table>
<tr><th colspan="3">Week 1</th><th colspan="3">Week 2</th></tr>
<tr><td>Day 1</td><td>Day 2</td><td>Day 3</td><td>Day 4</td><td>Day 5</td><td>Day 6</td></tr>
<tr><td>Preparatory meeting with the teacher</td><td>3B: Presentation of the research project and signing consents</td><td>3A: Presentation of the research project and signing consents</td><td>3B: Class observation</td><td rowspan="3">3A: Interviews with the students</td><td>3B: Class observation</td></tr>
<tr><td rowspan="2">Setting-up of technical equipment</td><td>3B: Questionnaire on videogame habits and moral issues</td><td>3A: Questionnaire on videogame habits and moral issues</td><td rowspan="2">3B: Interview with the students</td><td>3B: Interviews with the students</td></tr>
<tr><td>3B: Class observation</td><td>3A: Class observation</td><td>Interview with the teacher</td></tr>
</table>

By the end of the activity, it was possible to interview the teacher and 13 of the 26 students, including students who had been visibly active or inactive during the activities. The level of reflection the Norwegian students displayed about the role of videogames for learning—not

only in the classroom but also at a societal level—showed that most of the interviewed students had likely been led to think during their previous GBL experiences (Andreassen, 2015). From the teacher´s own experience in previous years, he made a few adjustments in GBL practice to better achieve curricular goals. For example, he restructured the presentation of theories to occur in alternation and in direct relation to each of the dilemmas. The school also used students' interest in videogames to prevent a drop-off in vocational courses and has fought motivation-related problems with weekly non-mandatory extracurricular activities involving videogames. The principal asked the teacher to create a project called *Next Level*, which will explore other possible GBL activities in different subjects and will increase other teachers' competences in using GBL. Table 7 describes the data corpus from the Norwegian case study.

Table 7. Data corpus in the Norwegian case.

Type of data	Description
Video records	459 minutes of video records from two fixed cameras during the two lessons (corresponding to 227 min of GBL activities). One camera provided an overview of the whole-class activities (with 107 min from Lesson 1 and 120 min from Lesson 2); the other camera focused on the focal groups' small-group work (110 min and 120 min, respectively). The data set refers only to Class 3A. These data function as primary data.
Field notes	Notes taken by the researchers during the fieldwork, registering key events that occurred during particular interactional aspects.
Audio records	306 minutes of audio records from semi-structured interviews with the teacher and 13 students (interview scripts are shown in Appendices 1 and 2).
	Non-structured interview with the principal conducted earlier in the year.
Pictures	Pictures from the class activities.
Documents	Copy of the theoretical PowerPoint slides provided by the teacher.
	Reports from the app *Geddit* with students' votes.

4.3. Methods of analysis

The theoretical frame adopted in this study led to a consideration of game-based learning within complex social and culture interdependences. Analyzing the complexity of collaborative meaning-making under this lens requires attention to the content of utterances as socially situated (Vygotsky, 1978) as well as consideration of the dialogic structure of the expressions (Bakhtin, 1981). The main data analyzed resulted from direct observations and video recordings of class activities. Other descriptive ethnographic data was also integrated into the whole data corpus, including audio recordings of interviews with participant students, teachers, and principals), students' written productions, pictures, and extensive field notes. The video recordings served as the primary data, and the interviews and other supplementary data informed the global understanding of the context. These recordings also allowed for detailed descriptions of the settings, thus helping with the analysis of the dialogs, interactions, and activities across the different contexts (Paterson, Bottorff & Hewat, 2003).

The analysis of the data was developed in four steps, following an iterative process, which means that the emergent findings informed new process-oriented questions and determined the next steps. The first step was to gain a description of how the GBL trajectories developed in both cases. I used methods inspired by Braun and Clarke's (2006) thematic analysis to identify patterns within the whole data corpus. When using methods inspired by thematic analysis (TA),

I followed the line that led Braun and Clarke (2019a, 2020) to rename this approach *reflexive* thematic analysis, emphasizing the importance of "the researchers' subjectivity as analytic resource, and their reflexive engagement with theory, data and interpretation" (2020, p. 3). Despite the more structured process for data engagement recently proposed by the authors, they clearly state that this guidance should not be interpreted as rigid or prescriptive. They stress the flexibility of reflexive thematic analysis as a method. In Braun and Clarke own words: "The flexibility of (reflexive) TA as a method, rather than a fully-embedded methodology, means it can be under taken with quite different guiding theories (…) and using quite different orientations to data, coding practices and theme development" (2020, p.4). My use of thematic analysis follows from what the authors recognize as the diversity of thematic approaches that aim to identify and make sense of patterns of meaning across data.

Over multiple viewings of the videos, I developed an inductive process of substantive categorization (Maxwell & Chmiel, 2014), inductively generating descriptive categories of the data. I used Excel sheets—with each column cell representing 30 seconds—to create timelines of the class activities and used different colors to represent different activities taking place. I recognized common activities, pinpointed moments of change between activities and categorized the trajectory of different activities in both classes. I identified patterns within the whole Portuguese and Norwegian data set to sequence the classroom GBL activities and thus describe how the trajectories of GBL unfolded over time, with alternating periods of the following activities corresponding to six descriptive categories: gameplay, whole-class debate, small-group work, theoretical explanations, students voting, and conducting class presentations. This analytical process also helped me clarify how gameplay was differently integrated with other activities and resources in both settings.

In the second step of the analysis, and following my theoretical interest, I zoomed in on a shorter data set corresponding to the teacher-led discussion activities. The discussions of the five game dilemmas were transcribed in their original languages and later translated into English. Conventions adapted from Jefferson (1984) were used when necessary to mark intonation and non-verbal activity.

The two analytical steps described above were done as an initial approach to the whole data set from both cases and common for all the three articles. Further on, data was more specifically approached in relation to the different RQ posed in each article.

In the third step of the analysis, I selected episodes among class dialogues. In each article, episodes were selected for being illustrative of typical sequences of speech that would help to clarify the article's aims. In Article I, I selected dialogue excerpts from the discussion of dilemmas 1 and 2 in the Portuguese case, to investigate how combining dialogue and the videogame mediated collaborative reasoning processes of meaning-making during the GBL activity. While analyzing the class dialogues, I identified different themes the participants were addressing. I organized talk in four categories: real-life situations, game context, abstract moral considerations, and curricular content. I then analyzed how the collaborative class discourse moved across these emergent categories. I manually drew graphic representations of how discourse was changing from one category to another, along the timelines. This helped me to understand how participants were moving from one kind of theme to another. Later, in Article II, I selected excerpts from both cases to investigate the relation between instructional dialogic designs and transformational play. In Article III, I selected excerpts from discussions of

dilemmas 1 and 4 in the Portuguese case to investigate the students' engagement along the learning trajectory.

In all the three articles, the selected interactional excerpts were extensively analyzed using micro-analytic approaches of moment-to-moment interactional analysis, inspired by Jordan and Henderson (1995). The unit of analysis consisted of moment-by-moment interactions that were embedded in class dialogues about ethics and moral reasoning. For the interactional analysis process, the excerpts and correspondent video data were reviewed multiple times, focusing particularly on how interaction developed in a temporal chain, with later utterances sustained by the previous ones in order to describe a shared construction of meaning. A dialogic view of learning was used while analyzing the classroom talk. The analytic approach chosen for this study differs from linguistic analysis because it emphasizes the content more than the organizational structure of the language; it also differs from conversational analysis because it focuses on the cultural context of the talk. My approach seeks to provide an understanding of the function of language and talk within joint intellectual activity in pursuing a shared understanding that evolves over time in a specific social context (Mercer, 2004). This process revealed how utterances sequentially reflected the inter-animation of different voices, thus allowing meanings to emerge and develop. The described interactional analysis process was performed in two steps (Linell, 1998): in the first step, the transcribed class dialogues were analyzed to describe the events; in the second step, those results were analyzed in accordance with the research questions of different articles.

In the fourth step of the analysis, I relied on concepts from the theories in use, in combination with the described analytical approaches, to elaborate on results, according to the specific research questions posed in each article.

- In Article I, I used the concepts of mediation, positioning, and appropriation (Vygotsky, 1978; Wertsch, 1991, 1998) to analyze the selected excerpts in relation to RQ1. I searched for evidence of how the teacher—with an open mind and bearing in mind the infinitive possibilities of new perspectives and insights—wove the students' contributions into coherent wholes and helped the students to fill in the gaps between confronting perspectives. I used this theoretical lens to analyze the selected episodes where questions around the game dilemmas were being posed to lead to a range of non-determined possible answers that were themselves treated, not only as endpoints, but also as generators of further questioning, with the intention of describing how students reasoned together to anchor everyday and scientific knowledge in GBL.
- In Article II, I analyzed the selected excerpts in relation with the transformational play framework (Gresalfi et al., 2009; Barab, Gresalfi & Ingram-Goble, 2010; Gresalfi & Barab, 2011; Barab et al., 2012). I used this theoretical framework to answer RQ2, RQ3 and RQ4, aiming to clarify the relation between dialogic positioning of person/content/context and transformational GBL experiences with a COTS videogame.
- In Article III, I elaborated on the thematic analysis previously developed in step one to identify and characterize different parts in the GBL trajectory. Then, based on different engagement theories (Fredricks, Blumenfeld & Paris, 2004; Lawson & Lawson, 2013), I searched for evidence of different types of students' engagement along the different parts in the trajectory. Finally, I used interactional analysis of selected excerpts to identify PDE

principles (Engle & Conant, 2002) in the teacher's enacted design and analyze how those extended students' engagement to higher levels (Gresalfi & Barab, 2011) in a productive and disciplinary way.

This thesis combines the results presented in these three articles and elaborates on them, offering an overarching discussion in relation to the main research question. The whole analytical work described above corresponds to approaching the data involving two levels of analysis that inform each other: at a trajectory level, considering the whole learning process and analyzing the students' progress over time, and at an interactional level, investigating the moment-to-moment social construction of knowledge to understand how meanings were collaboratively created through dialogue. Thematic analysis was only used for the initial organization of the data to identify patterns in the empirical material, but the findings are not presented as themes. For that purpose, interactional analysis was used. Taken together, these two levels of analysis provide insights into not only how some dialogic activities became relevant at a point in time but also how and why they were relevant throughout a learning trajectory.

4.4. Ensuring methodological quality

The sociocultural and dialogic approaches taken in this study place it in a distinctive position among research paradigms. The sociocultural stance of this study led me to opt for a qualitative research design. Qualitative research designs refer to a methodological approach that is used in many different academic disciplines. Beyond the important main questions dealt with by quantitative research—what, where, when and how many—qualitative methods also investigate the *why* and *how* of the phenomenon by asking process-oriented questions (Silverman, 2015). This methodological approach is common in the field of social sciences—and particularly in education—because, in these fields, reality is perceived to be a combination of multiple compounded scenarios that are only indirectly understandable. The aim of gathering an in-depth understanding of such phenomena often does not match the positivist canons of pure quantitative research (Guba & Lincoln, 1994).

4.4.1. Qualitative research: Methodological and analytical considerations

Human behavior is very particular and complex, and our reasons and motivations are very suitable to be studied by qualitative research methods. These behaviors are also situated within and highly dependent on the context in which they occur. As mentioned, the research for this thesis is based on case study design. When the research project is informed by a descriptive question and an explanatory question, as in this study, the case study method is suitable (Yin, 2006); according to Yin, "compared to other methods, the strength of the case study method is its ability to examine, in-depth, a 'case' within its 'real-life' context" (2006, p. 111). In contrast to quantitative studies, qualitative methods do not attempt to comprehend the large amount of randomized sampled information that would otherwise allow for extrapolation. Generalization within any research method is complicated. It includes various fidelity and reliability issues and has been the subject of debate for many years throughout the scientific community. Qualitative research poses even more difficulties because of the subjective nature inherent to its focus. In

the conventional view, qualitative methods produce information only on the particular cases that are studied. Nevertheless, within limitations, some scholars argue that it is absolutely possible to infer some conclusions from qualitative studies as well (Silverman, 2013). The key is to formulate serious methods of data analysis that will reduce doubts about the reliability and validity of any findings produced in this manner (Sinkovics & Alfoldi, 2012). Doing so seems especially important because, in qualitative research, we often face relatively unstructured data collection processes, subjective data and fairly subjective interpretative processes (Morse, 2015).

The various criteria for identifying methodological quality within qualitative research have been covered well in the literature. A highly recognized landmark comes from Guba and Lincoln's (1994) proposal of a new model for evaluating the quality of qualitative inquiries. However, scholars still do not agree that a new terminology reflects any effective gains, either in research designs or in the quality of inquiries (Morse, 2015). The criteria that these authors proposed for achieving trustworthiness include prolonged engagement with persistent observation in a way that will allow for a rich, thick description of the phenomenon, complemented with later research procedures such as using peer review to prevent bias, and making use of techniques such as analyzing negative cases or triangulation. They also suggested the importance of a posteriori member-checking (in which participants comment on the analysis) and external audits. Morse (2015) questioned how these criteria should be used for evaluating the trustworthiness of natural inquires, as described by Guba (1981), and concluded that it is not clear how all the criteria are actually applicable to all research designs, nor are they all equally valuable for any qualitative research. I will then follow Morse's recommendation and return to the previous conventional terminology in discussing the methodological quality of my study, but I will still make use of some of the criteria proposed by Guba and Lincoln (1994) in trying to clarify how some of the criteria were important to ensure rigor/trustworthiness within this study's analytical process.

I will now discuss these issues in relation to how both data collection and analytical strategies provided opportunities and limitations in terms of assuring methodological quality, starting with the study's validity. Validity is concerned with the extent to which a chosen method is appropriate for studying a certain phenomenon and how the data accurately represent the phenomenon to which they refer (Hammersley & Atkinson, 2007). In qualitative research, this situation is not as directly connected to the use of standardized procedures as is the case with the quantitative paradigm (Silverman, 2013), although qualitative researchers must be certain that any judgments and inferences that are made from the data are trustworthy. Doing so implies considering both internal validity and reliability. Acknowledging that internal validity and reliability are often intertwined (Morse, 2015), I decided to treat the two concepts together to assure the clarity of my argument. I will also comment on the external validity of the study and the limits for the study's generalization. I will conclude with comments on how ethical issues were considered during the research.

4.4.2. Theoretical validity

Theoretical validity refers to the degree of match between observations and the theoretical ideas used in the study. In this thesis I relate the fieldwork's set of data to the existing literature and theoretical and empirical knowledge from several disparate literature sources. As mentioned,

throughout the development of the study, I have consulted journal articles and books, as well as other relevant documentary sources such as official reports, websites, and media articles. Those were considered to be of relevance, not only for analytical purposes but also for research design and implementation. Indeed, the nature of qualitative research is such that it does not represent a linear process. I cannot picture my research progress by starting with a theoretical review, setting of the hypotheses, and then preparing fieldwork to go to schools test the hypotheses at the scene, before finally moving on to analyze the data and draw conclusions. This linear structure is more compatible with the quantitative methodology of the experimental tradition but is almost impossible as a way of matching the complexity of qualitative approaches. This aspect is clearly stressed by authors such as Sinkovics and Alfoldi (2012), who adopt the term progressive focusing to address the "iterative cyclical process" inherent to qualitative research. They take the research project itself as a trajectory, with the researcher's perspective evolving over time in sequences of posing questions, examining the data, and looking for theory input. The essential idea within all these terms is that qualitative research is a non-linear approach whereby findings frequently emerge through gradual evolution, driven by the complex interaction between data and theory (Sinkovics & Alfoldi, 2012). This was the case of the present study. It often occurred that the preliminary analysis exposed constructs that had not previously been considered. For example, the initial development of a pilot study raised several important aspects to be considered during the implementation of the main study; an example is how preliminary observations implied theoretical and methodological shifts, that also reflected in the type of questions that were defined in the interview scripts for the actual case studies. These procedures align with the idea inherent to qualitative methodology, in cases where the procedures seem to be of particular interest to the researcher and require further investigation. In this thesis, for example, each article arose from new questions posed by the data analysis and from questions elicited while writing a previous article. Frequently, during the analytical work on this study, it made sense to return to the literature to refine the underlying theoretical and conceptual foundations. Qualitative researchers often alternate between these steps until they reach a point where the theoretical focus, the empirical data and the potential contribution are in line with one another, and a theoretical explanation developed from the research is therefore credible and defensible (Johnson & Christensen, 2017). Following these guidelines was also my way of assuring theoretical validity across my work.

4.4.3. Internal validity and reliability

The expansion of data collection by using more than one case study—as done in this thesis—benefits both internal validity and reliability (Silverman, 2013). However, involving two countries and collecting data across different settings such as in Norway and Portugal also created additional challenges, because it generated data reflecting more than one reality (Guba, 1981). The opportunities and limitations of this situation are analyzed below.

As traditionally described, reliability can be assured either by replicating the results in similar conditions or by finding a negative case to study. However, the qualitative nature of the present study offers particular challenges. It did not allow precise replication, since every class is considered a unique, unrepeatable interactional system. To find a negative case within the study of learning processes involved in GBL would also be difficult—if not impossible—as it would certainly be expected that in any GBL situation some interactional processes would be

relevant and worth analyzing. However, if the Portuguese case does not appear to be a negative case, it at least appears to provide contrast. Including a second contrasting case in a different country, where the school's predisposition to GBL was not particularly favorable, was a way of increasing validity and reliability.

I did try, however, to avoid the type of bias that results from using comparison designs involving non-equivalent samples or non-equivalent interventions (Morse, 2015). Instead, the two cases are considered "embedded subcases within an overall holistic case" (Yin, 2006, p. 113). The inclusion of two case studies was treated as a possibility of enriching the study by observing diverse manifestations of the same phenomenon. Doing so minimized the bias that necessarily results from selecting a unique and particular example of the phenomenon being studied.

The provision of several measures of the same phenomenon—class observation was followed by post-interviews, where the participants could comment on the class experiences—was also a way of increasing internal validity, as it can be considered a very crude form of triangulation. This form roughly resembles aspects of member-checking, as posed by Guba (1981), since the participants had the opportunity to comment on a phenomenon they had participated in; this secondary data indeed helped to inform the analysis of the primary observational data.

The analytical process was identical in both cases and is presented in detail in section 4.3. In the first step of the analysis, themes were emerging from the data itself rather than being previously detailed, as recommended for reassuring validity when managing unstructured data (Morse, 2015). In contrast to analyses of more structured data, in this case I was managing unstructured data, where analytical process, namely thematic analysis, is much more interpretative (Braun & Clarke, 2020). In these cases, Morse (2015) claims that the use of a second person categorizing the data can lead to the analysis becoming superficial and irrelevant. The initial process of organizing the data set, and identifying themes and different categories within the class discourse, was then mainly conducted by me as the main researcher (although it was discussed with my supervisors at different moments in order to achieve a clearer definition of the categories under consideration). As main researcher I had a complete in-depth knowledge of the whole data corpus which was itself a relevant aspect in terms of making categorization decisions. Also, while selecting excerpts in later steps, I tried to follow ground rules in line with Morse (2015), such as assuming the most neutral stance possible toward the data and trying to include more than one possible representation of the phenomenon under examination in the different articles. The later analysis and interpretation of those excerpts was, however, an intensively collaborative process, whereby feedback from other colleagues was considered to ensure transparency in reflections and interpretation. Interactional analysis by means of a transparent three-level method was used: I firstly provided a detailed description of the episodes, then made analytical comments, and finally framed the episodes and their analysis against a theoretical frame.

Reliability refers to consistent results (Silverman, 2013), i.e., whether the same result can be maintained from one occasion to another. In qualitative research a certain margin of variability is tolerated because the methodology and epistemological logistics produce data that, even being ontologically similar, may differ in richness and ambience (Leung, 2015).

The use of video recordings offers better reliability than other forms of data collection, because they allow the data to be viewed at different moments and by different people. All the excerpts were analyzed by more than one researcher (my supervisors and me) and were discussed at research group meetings or data workshops, including with colleagues from several universities; these people provided peer review, which guaranteed a good degree of validity and reliability in the analytical process.

Using prolonged engagement over an extended observation period is another way of increasing internal validity. The relatively long periods dedicated to data collection at both schools (two weeks in Norway and six weeks in Portugal)—spending extended periods of time establishing informal contacts, observing the school contexts as a whole, and watching and interviewing others in the school community—contributed to increased internal validity. These experiences enabled a rich, thick description, thus allowing the analysis to be informed by more elements than those directly collected from formal data collection periods.

Despite my efforts to describe and understand a learning trajectory, the research design was, however, time-limited; in terms of reliability, it did not include any longitudinal analysis, which may otherwise have sustained the long-term effects or any eventual transfer potential of the present learning situation.

4.4.4. External validity

The generalizability of findings, also called the external validity of a study, expresses the extent to which a result is maintained across settings, persons, and time (Maxwell, 2012). The analysis of specific situations and contexts represents possible activities in social practice and is thus relevant to other contexts (Ercikan & Roth, 2006). One of the main instruments for pursuing the generalization of conclusions is the use of random samples, but this sampling method is very difficult to organize in qualitative analysis (Silverman, 2015), and the present study is no exception. Both contexts were intentionally chosen in order to represent the phenomenon under examination: one context because it represented an experienced, ongoing GBL practice and the other to function as a contrasting case; the focal groups were also chosen by the teacher, so randomization was not a criterion that was possible to follow.

The common use of small samples added to selected samples like this makes the process of generalizing results much more difficult to achieve. For this reason, external validity in qualitative research has been the subject of significant discussion (Silverman, 2013), but case studies like this may also generate some analytical generalization (Kvale & Brinkmann, 2009). Collection of data across different settings has then contributed to the generalization of the findings to some extent. Including two case studies, as this research does, allows for a reasonable judgment of how the results can be used as a guide to what might happen in another context.

This study provides rich descriptions of the cases, such that anyone can reestablish the study's setup and consequently reproduce this aspect of validity. Providing thick descriptions of the setting along with the dialogue excerpts helps to determine whether the findings will be valid in other situations (Guba & Lincoln, 1994). Another important aspect in claiming generalization when using case study designs is the strong sustainment of conclusions against the theoretical frame that is used and the related empirical literature (Silverman, 2015). Chapter 2 of this thesis presented the main theoretical ideas and concepts that informed this

study's analytical approach. Chapter 3 presented the "state of the art" based on the empirical results from previous research in the three main research fields that underlie my research project. In order to increase the external validity of this study, the later part of this thesis will discuss the data and results in relation to these two pillars of both theoretical and empirical backgrounds.

4.4.5. Ethical considerations

A research project entails a wide spectrum of implications. Every research project that produces concrete results helps to determine the evolution of scientific knowledge, but such projects also have both immediate and delayed social repercussions. They integrate the responsible act of influencing thinking and politics and, eventually, determining lives for the populations enrolled in the study. These factors must therefore be taken into consideration by any researcher when planning, conducting, and publishing the results of a research project. The issue becomes even more evident when researching in the field of social sciences, where human beings—in all our complexities—are taken as the study object. Conducting research in the field of educational sciences offers particular challenges connected to several dimensions. This research project:

- focuses simultaneously on several subjects who play different roles in contributing to the educational situation (e.g., teachers, students and principals);
- considers a combination of multiple aspects and dimensions of a complex reality, including material resources and human actions (e.g., curricula, textbooks, teacher beliefs and the students' psychosocial reality);
- studies an abstract entity—the learning or teaching process—that reflects years of institutional practices and politics;
- uses an object of study with a determinant role from a societal perspective (i.e. educational systems are directly related to the characteristics of future societies);
- is also located in the field of CE, which makes it extremely sensitive to ethical questions.

The intention of the CE educational field is to promote structured and organized development of the student's conscience about societal issues. Any research project developed within this educational field must therefore set exemplary standards regarding the project's ethical implications, since its results may affect educational practices that will ultimately form citizens.

All these aspects combined alerted me to the need for a well-reflected ethical frame underlying my research project. This section of the thesis reflects on the ethical issues involved in the research study. Because it is a transnational study, it followed ethical criteria related to the norms of the two countries. The study was previously registered with the Norwegian Center for Research Data (NDS) and legitimized as being in accordance with the Guidelines for Research Ethics in the Social Sciences, Law and Humanities proposed by the National Committee for Research Ethics in Norway. In Portugal, the study required previous authorization from the National Commission for Data Protection (CNPD) and the Department for Monitorization of Surveys in School Settings (MIME) from the Portuguese Ministry of Education (Appendix 5).

Before participating in the project, all participants signed a written consent form (Appendix 6), in which they acknowledged that their participation was voluntary and that they had been informed about their rights, specifically their anonymous status and their free will to withdraw at any time. They were also informed about how their personal data would be

protected. This document was created in accordance with previous recommendations that the nature and aims of the research project should be provided in a detailed but non-technical manner, i.e., in ways that will be understandable to the participants (Silverman, 2013). Informed consent was also assured by providing a verbal explanation. The role of the researcher was to be an independent observer. Data collection did not interfere in the teaching process, clash with other school obligations or disturb the students' leisure time. All students were over 15 years of age, hence, in accordance with what is established in Norway, there was no need to obtain parents' signatures. In Portugal they were all over 18 years old, so the same applied. The fact that the research study follows an educational practice that uses a videogame recommended for those who are 18+ in a class where some students are younger than 18 (in Norway) could lead to some ethical concerns. However, the study followed an already existing practice at the Norwegian school and the choice of the game was not directly related to the research design. The project was later voluntarily appropriated by the Portuguese school, in the persons of the participant teacher and the principal. Video records, audio records, photos, transcripts and field notes were treated as confidential data and stored in an especially secured server at the University of Oslo created specifically for that purpose. Access to the data was allowed only after securing personal credentials and was restricted to the research team directly involved in analyzing the data (i.e., my supervisors and me). Because the sample was very small, special caution was taken to avoid indirectly exposing the subjects (with the exception of the Norwegian teacher, whose identity it was impossible to protect, owing to his previous media exposure, but who had wittingly consented to be directly identified in the context of this study). The names of the participants were changed, and their personal data were stored apart from the research data. Anything that was published ensured that subjects could not be identified. The purpose of this study is to provide a collective benefit for the research community through the publication of its results, which involves ethical justification of the project's implementation.

5. Article summaries

This study followed a GBL practice in two case studies where students depart from the situational context of a videogame to obtain conceptual curricular knowledge about various ethical theories. The topic was addressed in three different articles. The first, Article I, focuses on the Portuguese case and concludes that two mediational aspects contributed to meaning-making in GBL: the participatory nature of the videogame and the teachers' dialogic approach. The second article explores classroom activities in both countries as an arena in which transformational play can occur (Gresalfi & Barab, 2011). The third article explains how the Portuguese classroom activities supported productive disciplinary engagement (Engle & Conant, 2002). The following sections present an integrated summary and discussion of the three articles. This section summarizes the articles and the next section clarifies the relationship between the reasoning processes discussed in Article I and the teachers' dialogic designs to promote transformational play described in Article II, with the different forms of students´ engagement described in Article III.

5.1. Article I

Article I focuses on the Portuguese data and describes how GBL design transformed a game experience into a learning experience. The following research question was posed:

RQ1: "How do students using a commercial videogame in citizenship education collaboratively reason while learning about ethics and morals?"

The analysis describes how the teacher and students collaboratively used several reasoning strategies in whole-class debates and small-group discussions. It reflects on how those were mediated by the teacher and the nature of the videogame. During an in-depth analysis of the collaborative reasoning processes involved, the students' reasoning appeared to draw on different types of references throughout the discussion. Article I identifies four different ways in which the students reasoned collaboratively, i.e., discursive themes:

(1) discussions of the game narrative, which focused on (1) the game story; (2) the characters' actions, beliefs and feelings; and (3) the unfolding of the story and the consequences for the whole narrative;

(2) the introduction of examples from other contexts outside the game narrative, such as real-life situations, whether factual or hypothetical;

(3) the use of conceptual reasoning to address the ethical theories that formed part of the curricular content;

(4) the introduction of abstract reasoning, which revealed more general moral considerations.

The analysis of the participation trajectory revealed a mixed use of bottom-up and top-down processes in collaborative reasoning to move between these categories. A bottom-up reasoning

process happens when students depart from concrete examples (either from the game or from real life examples) and develop more conceptual reasoning about morality or ethics. A top-down reasoning process occurs when they use theoretical concepts to analyze a concrete situation. Article I ends by proposing a model for what I term the *anchoring process*. It illustrates how reasoning processes served the process of learning across contexts, anchoring dialogic reflection to link knowledge domains, specifically scientific and everyday knowledge. Both the interactive nature of the videogame and the dialogic interactions, facilitated by the teacher, worked together to promote the anchoring of knowledge.

This article shows that multimodal resources and teaching methods combining school and out-of-school practices were of value to the learning of curricular content. Combining resources such as a COTS videogame with dialogic methods facilitated collaborative reasoning processes to effectively link conceptual and empirical knowledge, and thus promote content meaning-making, deeper learning and intercontextuality.

5.2. Article II

In the second article, my co-authors and I built on the idea that the goals in designing educational games for transformational play, as Barab et al. (2010) proposed, are actually similar to the goals of the GBL activities being studied. Indeed, what teachers ultimately intended when using COTS GBL is similar to what designers intend when creating games for transformational play: "(a) to take on the role of a protagonist (b) who must employ conceptual understandings (c) to make choices (d) that have the potential to transform (e) a problem-based fictional context and ultimately (f) the player's understanding of the content as well as of (g) herself as someone who has used academic content to address a socially significant problem" (Barab, Gresalfi and Ingram-Goble, 2010, p. 526).

Through this process, they intended that their students perceive the theoretical content as meaningful and for them to be capable of using the content effectively to address socially significant situations (Gresalfi & Barab, 2011). This premise—which is indeed how Barab and colleagues describe transformational play—is precisely what I saw happening in the GBL situation under examination.

This article reflects on how the different instructional patterns of the two teachers were relevant to changing the gameplay experience into a transformational learning experience. We conducted a deeper analysis of how positioning was promoted through dialogue and class conversations. We addressed the following questions:

RQ2: "How was the commercial videogame integrated with other educational resources by the teachers in the two classrooms?"

RQ3: "What kind of positioning work, key to transformational play, was accomplished through the teachers' dialogic interactions and the enacted learning designs?"

RQ4: "In which ways did the teachers' dialogic interactions support meaning-making in citizenship education and ethics?"

We analyzed the instructional designs used by the teachers from both countries and found them to be very close to this particular description of transformational play, which is commonly related to the design of educational games. We found that the dialogic approach used in the instructional designs of both case studies supported the positioning of person, content and context in particular ways that resemble TP and that facilitated learning with COTS GBL. We concluded that TP, a concept usually associated with educational games' design, was enacted through the teachers' dialogic approaches while using a COTS videogame.

This article shows that the teachers' dialogic instructional designs are of key importance to support meaning-making when integrating a COTS videogame with other educational resources, especially because they may provide a kind of positioning work that enables gameplay with a COTS game to become a transformational learning experience.

5.3. Article III

Article III analyzed the Portuguese data to explain how the teacher's enacted design extended students' engagement with the game to become engagement with disciplinary learning. To understand how the teacher enacted the design of GBL to support engagement that becomes disciplinarily productive over time, my co-author and I addressed the following research questions:

RQ5: "What characterized the teacher's educational design, and how did it foster students' engagement beyond the game?"

RQ6: "How did the students make sense of the ethical theories during the curriculum unit?"

In the article, we did not view engagement as a property of the individual, nor of the organization of the lessons, but as changing situationally and depending on the students, tasks and other aspects of classroom practices. In addition to Gresalfi et al.'s (2009; 2011) contributions, we included several other views of engagement (Fredricks, Blumenfeld & Paris, 2004; Lawson & Lawson, 2013; Engle & Conant, 2002) to characterize students' engagement along the learning trajectory. Finally, we extensively drew on Engle and Conant's (2002) productive disciplinary engagement framework to explore engagement as part of the mediational means within a learning situation that was designed to include new technology and dialogic approaches within different sequential activities. The PDE framework (Engle & Conant, 2002) explains the importance of (1) encouraging students to problematize topics, (2) giving them authorship and intellectual agency to collaboratively solve problems, (3) asking them to account for disciplinary standards and others' ideas, and (4) giving them the necessary resources to do this work.

The results showed that the teacher's enacted design, planning of the activity and use of dialogic methods, all reinforced the students' sense of authority regarding the disciplinary matter, thus positioning them as central decision agents regarding the game events. She also helped the students to further engage in problematization and endorsed their problematization as being valid and important. She offered the students important resources, such as theoretical frames to reason from, as well as lengthy discussion times and constant dialogic support to help them reason through the game dilemmas. Finally, she promoted and invited frequent theoretical

linkages between the students' opinions about the game narrative and theoretical disciplinary content. She required justifications to make the students accountable for their arguments about decisions to be made in the game or in any other context.

The article concludes that both the sequence of activities proposed by the teacher and the way she organized and dialogically supported the students' participation implicitly using PDE principles contributed to engaging the students beyond the videogame and led them to learn ethical theories over time.

This article shows that learning trajectories in GBL reflect and depend on different aspects of students´ engagement. It also shows that a GBL design using dialogic approaches and PDE principles facilitates more elaborated forms of students' engagement, which may extend the engagement with the game to engagement with the curricular content. This process facilitates mastery and appropriation of the theoretical content and therefore makes COTS GBL more productive from a disciplinary point of view.

6. Discussion

This chapter offers a discussion of the findings, elaborating on the sociocultural and dialogic aspects of the studied phenomenon. It starts by presenting the main theoretical and empirical contributions of the study and its pedagogical implications. Later, it summarizes the main conclusions, reflects on the limitations of the study, and proposes several recommendations for further research.

6.1. Theoretical contributions

This study has drawn on and contributed to scholarly literature that examines the potential of dialogic approaches to learning in technology-enhanced environments, namely in the field of CE. Specifically, the study theoretically contributes a learning model for understanding the particular case of meaning-making of ethical theories using GBL. The model describes the main reasoning processes participants used when collaboratively making meaning of various ethical theories in relation to the videogame. This model, which I have termed the *anchoring process model*, is presented and extensively described in Article I and briefly summarized here:

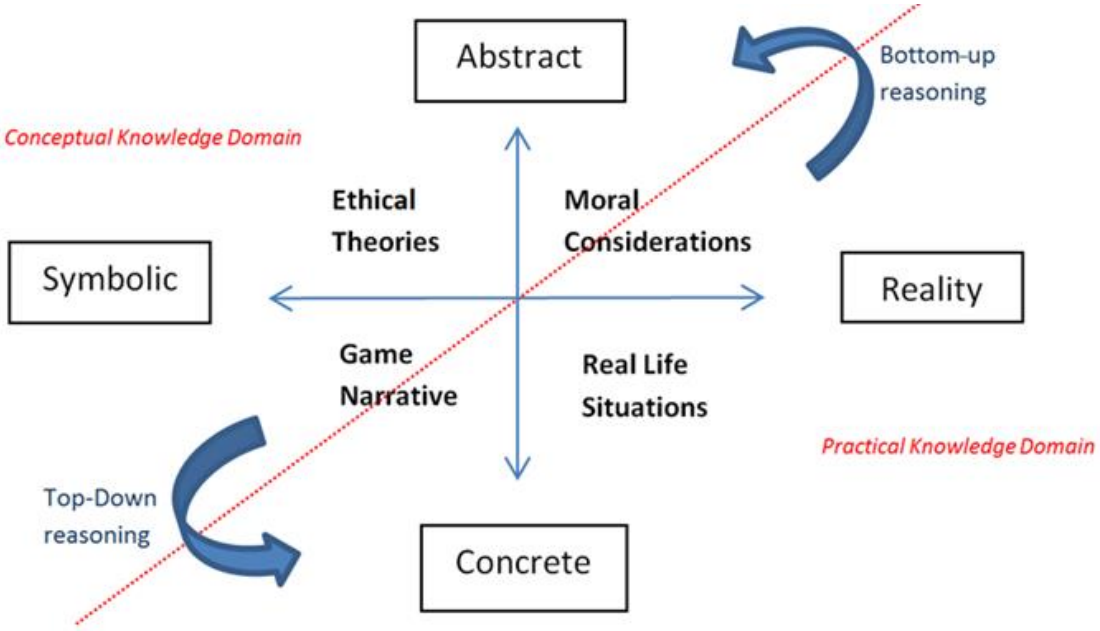


Fig. 13. Anchoring Process Model.

Figure 13 illustrates how participants´ reasoning alternated between four main themes: real-life situations, game narrative, moral considerations and curricular content (i.e., ethical theories, in this case). This model reveals how knowledge construction was anchored, as class discourse combined these four discursive themes through bottom-up and top-down reasoning processes, constantly linking conceptual and practical knowledge domains, as follows. The model represents the way students' reasoning moves along two axes. The reasoning moves along the vertical axe between *concrete* thought (ex. practical examples: "Imagine it was your sister there") and *abstract* thought (addressing theoretical concepts from the school content: "He is being completely utilitarianist!"). Both concrete and abstract thought can also move along the

horizontal axe from *symbolic* (referring to fictional examples of the videogame: "They are all zombies now, right?") and *reality* (giving examples from the real world: "We are all humans"). Morality (concrete moral considerations of what should be done) is seen as a practical application of ethical reasoning (which is more abstract and symbolic philosophical reasoning). The movement from concrete/real events towards abstract/symbolic thought is considered a *bottom-up reasoning process*. The opposite, bringing down abstract/symbolic thought to concrete/real examples, is considered a *top-down reasoning process*. These continuous top-down and bottom-up reasoning movements work dialectically, constantly anchoring conceptual and practical knowledge domains. The *anchoring process model* describes an interactional system of collaborative learning in which design aligns with a dialogic view of learning and represents a valuable tool for understanding learning across contexts with GBL, namely in the case of CE.

Firstly, the anchoring process model illustrates the potential of technology to broaden and deepen learning dialogues, in line with Wegerif (2006). In particular, the model describes how GBL actually extended the problem-solving activities that the game posed, to a new level of problematization that required agency and conceptual involvement.

Secondly, the anchoring process model extends the TP framework and the construct of consequential engagement from the design of digital learning environments (Gresalfi & Barab, 2011) to the design of social learning environments in CE. Just as described by Gresalfi and Barab (2011) about TP, the reasoning processes in the anchoring process model also imply positioning the person with intentionality, the content as meaningful and the context as consequential. In fact, this study proved that:

- inviting students to actively take part in dialogic solving of moral dilemmas positioned them with intentionality;
- encouraging students to use a theoretical framework (such as ethical theories) to reason about concrete events in the game positioned content with meaning;
- leading students to relate the videogame to real-life scenarios fostered intercontextuality by reinforcing the consequentiality of moral action.

Ultimately, the dialogic environment and the learning design in the GBL context empowered students as citizens, because they required students to become civic agents that were able to effectively transform problematic social scenarios by enlisting and applying academic content in the form of ethical reasoning, allowing them to perceive themselves as able to do so in a socially meaningful way.

Thirdly, this model extends the PDE framework (Engle & Conant, 2002), as it elaborates on the importance of a learning environment that values problematizing while giving students the authority to solve problems, as well as the necessary resources to do so in an accountable way. One could argue that the dialogic view is less outcome-oriented than it is productive disciplinary engagement, because dialogism views dialogue as an end in itself rather than a means to reach a certain disciplinary outcome. In contrast, PDE aims to engage people in discussions that should lead to an increase in pre-conceived disciplinary knowledge and practices. This tension, however, dissipates because of the special nature of the disciplinary content of CE. For this subject, disciplinary knowledge is actually not so much a matter of mastering theoretical content, as it is a matter of applying that content through disciplinary

practices associated with ways of thinking and experiencing the world—which is much in line with and fulfilled by dialogic goals. Disciplinary knowledge in CE is more a matter of learning how to live in a society in accordance with certain standards, which includes being able to *problematize* and think critically, take *authorship* and responsibility for one's own decisions and actions, and *account* for and respect others' perspectives. Ultimately, education in this area may be a matter of dialogically providing students with access to the *resources* necessary for them to achieve these goals.

My findings empirically show the benefit of integrating multimodal resources—such as the videogame and dialogue—to create an appropriate arena for learning, as stated in the multiliteracies approach (The New London Group, 1996; Cope & Kalantzis, 2009; Cooper, Lockyer & Brown, 2013). By including situated practices, overt instruction, critical framing and transformed practices, the studied GBL practice opened the possibility for students to design and create a metalanguage for addressing ethical and moral concepts.

Referring to aspects posed by Gee (2003, 2004) as highly important for learning with videogames, and extending them to analyzing a GBL practice in the classroom context, the study shows that both teachers successfully provided possibilities for participation in safe environments where students could test different hypotheses, make decisions, and reflect on different possible outcomes. In fact, the whole GBL situation offered a problem-based environment, which required active agency expressed in socially situated practices of knowledge building.

Drawing from the views of authors such as Bakhtin (1986) and Alexander (2008, 2018), I provide empirical evidence of the importance of developing learning dialogic contexts. Namely, I follow a trend of research developed by authors, like Mercer, Wegerif, Silseth, Pierroux and Rasmussen, among others, which defends the particular importance of dialogic approaches in technology-enhanced learning environments. The study empirically corroborates the importance of integrating several voices representing contrasting perspectives, while considering other's points of view in the particular case of GBL.

My first article draws on Vygotsky (1978, 2016) to discuss at length how several physical and psychological resources were integrated to mediate learning. On one hand, the interactive and participatory nature of the videogame (physical resource) played an important part by offering a potential multimodal space that allowed for embodied and emotional experiences whereby players could learn content and produce meanings. On the other hand, the teachers' dialogic design (psychological resource) was essential, promoting participation through the sub-constructs of play and dialogue. My findings show that the dialogic approach promoted an open and critical disposition toward the process of joint knowledge construction to reach justifiable conclusions, in ways similar to those described in Geil (1998) and Mercer & Howe (2012). These findings are in line with accumulating evidence about the value of discussion and teacher interventions for collaborative meaning-making and deeper and active learning. As defended by Rommetveit (1992), these findings prove how learning is intersubjective, depending on participants' attention to each other's understandings. Findings also corroborate the importance of encouraging students to use personal experiences and evidence to support their conclusions, just as defended by Clark et al. (2003) and Silseth (2012, 2013). They also demonstrate the need to guide students when learning with technology, as defended by Rasmussen and Ludvigsen (2010), and reinforce the importance of the teacher's role in GBL,

as stressed by Hanghøj (2013) among others. My study illustrates the idea, defended by Wertsch (1998) and Polman (2006), that mastery and appropriation are aspects of meaning-making that are closely connected. In the results we see mastery and appropriation happening as a gradual process, as the various ethical theories gradually gained meaning and ownership among the students. Confronting the videogame story, both with the theoretical curricular content and concrete real-life contexts, was a privileged way of promoting this. Using Vygotskyan terms, participants were constantly linking scientific and everyday concepts (Vygotsky, 1986). The cumulative use of both references to everyday examples and connections between the game and theoretical content, proved to be effective, especially because it provided knowledge to grow with a personal connotation that thus facilitated not only mastery but also appropriation, in line with Wertsch (1998). An important aspect of appropriation is learning how to use tools outside the context in which they were learned (Wertsch, 1998; Polman, 2006). It is common for appropriation to involve an artifact overcoming its cultural inheritance (Säljö, 1998). In the study we see a videogame being used for learning in a classroom setting, i.e., away from the out-of-school entertainment context in which they are usually used. Appropriation in the study context allowed the students to apply ethical theories in other life contexts, and commencement of a process of appropriation was reflected in the students' construction of their own versions of the available information.

6.2. Empirical contributions

Elaborating on the sociocultural approach, Article I concludes that the dialogic approach to GBL used in this research helped the students to start mastering the cultural tools necessary to identify a moral challenge and appropriate the necessary tools to respond to that challenge in an intercontextual way. The students' technological experience at school was intrinsically related to their personal lives, and their playing of this game narrative contributed to their reflection on ethics and morals through a learning trajectory that was broader than that of the school community. The dialogic learning design helped the intercontextuality of the learning process, as stressed by Silseth (2013, 2017). There is much we need to learn about the design of instruction for intercontextuality, but, as said before, the anchoring process presented in Article I might be of importance for that matter, namely in CE.

My second article discusses how the teachers' roles and instructional designs were of key importance in GBL. My findings are in line with the argument that tools themselves are not inherently productive or unproductive for learning, as defended by Rasmussen and Ludvigsen (2010) among others. The study's analysis stresses other factors in the design of the learning environment. As defended by Charsky and Mims (2008), this study proved that integrating knowing and doing facilitated a more sophisticated understanding of the content.

The instructional designs and means that were used to engage students in the two case studies varied; while the Norwegian class was provided with all sorts of technological devices, the Portuguese class made minimal use of this technology. Additional technology use in the Norwegian case (e.g., the existence of smartphones, or the teacher's own use of a tablet and PowerPoint) increased the pace of the class but did not particularly affect the way students engaged and approached the main topics of the content. This faster pace did not allow for many lengthy discussion periods, however, which meant that fewer personal and real-life experiences were brought into the discourse.

In the Portuguese case, the teacher provided prior explanations of the ethical theories before gameplay and then used the game as a practice arena. This option aligns with the view that students become more engaged in a narrative-centered learning environment when they have prior content knowledge (Rowe et al., 2010). In the Norwegian case, the theoretical information was provided just in time for each dilemma, which follows an excellent educational principle that Gee (2003, 2004) refers to as present in good videogames´ design. In both case-studies, however, the theoretical frames for the students' reasoning were provided before the discussions, giving the students the chance to use this information during this practical activity. The game-related discussions using theoretical arguments were then structuring resources for students´ engagement and, in Van Eck's (2009) words, served as an anchoring environment that encapsulated the full learning cycle.

Results also show that both teachers broke the traditional IRF class interactions (teacher initiation-student response-teacher feedback) to open debate, with the videogame serving to deepen and broaden the dialogues. Just as described in the model posed by Wegerif and Mercer (1996) and later discussed in Wegerif (2007), in this study the videogame was put on hold, and IDRF patterns (initiation-discussion-response-follow-up) were implemented. The instructional designs used by both teachers made use of different types of mediation. As put by Wertsch (2007), both teachers commonly used explicit mediation (ex. provided theoretical frames for reasoning and used closed instructions) and implicit mediation (ex. used first person during discourse and also open instructions). Altogether, these findings establish the importance of the teacher's pedagogical competence in translating participatory and emotional gameplay into a conceptual learning experience, namely proving the importance of instructional and learning design.

Strategically, the teachers improved the students' learning opportunities both by providing a conceptual framework for dialogic reasoning about the game (which is called bottom-up reasoning in Article I) and by providing tasks that dialogically required the application of academic content in a practical way (which is termed top-down reasoning in Article I). Sequencing and alternating different instructional designs—open and closed instructions—is a strategy that both teachers used and that showed positive results, and that, following the model in Article I, served to anchor different knowledge domains.

On one hand, the use of open instructions and unstructured activities such as gameplay worked as triggers for the emotional involvement of the students. They passionately appropriated the theoretical implications in order to collaboratively make sense of the activities. Learner-centered environments (Bransford, Brown and Cocking, 2000) were created, and, especially in the Portuguese case, everyday knowledge and personal experiences were brought in to clarify arguments and persuade other interlocutors. This situation supports the idea that GBL should take advantage of one of the learning principles that videogames present, which is that videogames allow general conceptual meanings to be discovered as a bottom-up reasoning process in the situated context of the game (Gee, 2003, 2004). Narrative aspects strongly promoted emotional and behavioral engagement (Fredricks, Blumenfeld & Paris, 2004), which indeed mobilized the students' personal experiences and opinions, making them central, and thus facilitating appropriation and intercontextuality. This ultimately facilitated a community-centered environment (Bransford, Brown and Cocking, 2000) where students understood the ethics curriculum in relation to out-of-school contexts.

On the other hand, the inclusion of more closed instructions and structured activities also revealed to be important. The analysis illustrates how, during practical activities such as written tasks and small-group discussions, the teachers positioned their students with the authority to propose solutions to the problems the videogame posed, and prompted them to account for their arguments using academic content. By providing closed instructions, the teachers positioned their students so that they had both authority and accountability when addressing academic matters. This promoted a knowledge-centered environment (Bransford, Brown & Cocking, 2000) offering the possibility of applying the information in a more orderly manner. This environment also provided formative assessment opportunities, which added the possibility of verifying the students' knowledge and giving them feedback (Bransford, Brown & Cocking, 2000). These findings suggest that both open and closed instructions became important means for designing good learning environments where collaborative bottom-up and top-down reasoning processes were developed while making meaning of theoretical content.

Article II also analyzes enacted classroom instructional designs in relation to the TP concept, which is usually associated with the design of serious educational games. Results show that the dialogic discussion of the COTS game was also a kind of activity that integrated person, content and context in a transactive system that fostered learning in relation to the TP concept. This thesis clarifies the relationship between the model of the anchoring process presented in Article I and the three forms of positioning described by the TP framework explored in Article II. The results indicate that the teachers' instructional designs promoted positioning that varied along a trajectory:

- where students were invited to position themselves either as students or as players, depending on the task at hand;
- where participants were prompted to constantly make connections to the theoretical curricular content; this framed the game as relevant to learning about theoretical content, i.e., positioned ethical theories as a helpful resource for reasoning and solving moral dilemmas in the game;
- where the dialogues constantly invited parallels with other significant contexts, promoting awareness of wider meanings and practical applications, and thus positioning the game context as relevant to learning about other real-life situations.

Article III explores the conditions under which students' engagement evolved over time in ways that translated engagement with gameplay to disciplinary content. In line with earlier research, my study shows that engagement is a central concept for understanding the learning processes in GBL (see, e.g., Deater-Deckard et al., 2014). Acknowledging that not all kinds of engagement are productive for disciplinary work (Kumpulainen, 2014), my study contributes with in-depth findings about learning through engagement with COTS GBL.

The study reinforces the importance of interactional and sociocultural aspects of students´ engagement, as defended by Lawson and Lawson (2013), and reflects on this topic in the particular case of GBL. In agreement with both Jenkins et al. (2009) and Eseryel et al. (2013), my study proves that engagement and meaning-making depend not only on the videogame narrative and its interactive features, but also on the teachers´ role and the educational design. Engagement was then not moderated solely by the gaming experience, and the nature of the

game-related tasks proved also to be central. This co-influence is clearly demonstrated in the present study. My findings show that engagement and meaning-making widely depended on:

- the game itself—*TWD*, though not designed as an educational game, provided elements that promoted a kind of engagement that facilitated learning the ethical theories because it offered moral dilemmas and invited to moral choices with direct impact on the plot.
- the actions of the teacher and educational design, which were extremely important, as defended by other authors such as Buckingham & Burn (2007), Silseth (2012, 2013), and Hanghøj (2013) with my findings showing that more productive forms of engagement were promoted by dialogic means.

The study's results show that different levels of engagement represent progressive forms of meaning-making that have different values in relation to the learner's world. My findings show evidence that the different dimensions of engagement previously identified by Fredricks, Blumenfeld and Paris (2004) were invited to emerge by different tasks along the learning trajectory. For example, *behavioral engagement* was transversal to all GBL activities, but displays of *emotional engagement* were primarily associated with open tasks such as class debates, while signs of *cognitive engagement* were more evident during the more structured school-like activities.

Results also link the teachers' learning designs to progressively elaborated forms of engagement, such as the ones identified by Gresalfi and Barab (2011). In fact, the educational designs fostered the students to engage beyond the game's procedural aspects and to use it in the frame of conceptual, consequential and critical engagement announced in the TP framework. The use of videogames firstly allowed the students to develop *procedural engagement* while being invited to undertake several procedures and directly make decisions about the game's action, even though they did not have a broader purpose beyond advancing the game action. Second, the preliminary theoretical explanations and the reference to ethical theories during the discussion of videogame dilemmas pushed the students toward *conceptual engagement.* The first article describes this movement as a bottom-up reasoning process. In other moments, the students were also invited to apply the theory to concrete actions, in what the article defined as top-down reasoning processes. In this case, both the game's storyline and examples from real life were used. As the students evolved toward *consequential engagement*, they needed to introduce real-world examples so that they could evaluate the real value of the disciplinary tools with which they were provided. The later voting process also allowed the students to engage in a consequential manner, since they were able to perceive the direct consequences of their decisions. By the end, *critical engagement* was promoted by the whole-class meta-reflection conducted in the last class. Students and teacher reflected on how useful the activity had been for learning about ethical theories and whether the activity was connected to real life. The value of the disciplinary content was also debated, as was the possibility that participation in the GBL activity might influence their future behavior, an aspect of particular importance when learning about citizenship.

Finally, Article III discusses how PDE principles (Engle & Conant, 2002) were implicitly used in the teacher's dialogically enacted design, and how these principles also formed the basis for extending engagement to higher levels. Engaging students in rich situations that will add meaning to disciplinary concepts is valuable to the TP framework, much as it is for the PDE

framework. Indeed, PDE goals—much like those in transformational play—are meant to allow disciplinary content to be invested with a functional value in the world of the learner. The design led the students to engage beyond the game's procedural aspects and to use it in the frame of consequential engagement announced by transformational play, and thus make it disciplinarily productive. It is unlikely that this transformational movement would have happened without pedagogical intervention and, according to these findings, it is likely that it is one of the major strengths of using a dialogic approach to GBL.

6.3. Pedagogical implications for designing GBL

The present study shows what facilitated the students' academic engagement and provides recommendations based on the empirical analysis that may be of interest to teachers trying to implement videogames as a learning resource. Students often perceive school content as being irrelevant in terms of functional value. The same can be said about videogame play per se. The present study shows empirically how these perceptions were overcome with a well thought practice using a GBL environment. Here I present some recommendations for designing such learning environments. Videogames provide opportunities for engagement but do not necessarily guarantee particular forms of engagement in terms of content learning. Along with work within the game, GBL should support content engagement. The findings illustrate how the GBL educational design maintained the students' engagement while inserting an educational agenda. The interest most students showed in actively using ethical theories to discuss actions in the game (or quietly and attentively follow class activities) empirically corroborated the theoretical rationale, which underlines the importance of the game-based curricular design to engage students with theoretical content.

The practice as a whole was designed in accordance with lesson plans that avoided the delivery of concepts through decontextualized ready-made descriptions, instead giving the students the possibility of perceiving a world in which both their practical actions and the school content actually mattered. Coupling gameplay with other classroom activities was shown to be of value, especially because these activities stayed close to the storyline of the game and were not strictly focused on theoretical content. Keeping discussions and tasks close to the fantasy world of the game was proved a way to allow students' engagement to go beyond the game to extend to the theoretical content and their real-life experiences (Van Eck, 2009).

In both case studies, the teachers' role encouraged students to be morally reasonable asking "why" questions, stimulated students' emotional (ex. promoting students' empathy with the characters and guiding students toward virtuous behavior without presenting their own moral opinions. Those correspond to the three aspects of key importance pointed by Willems et al. (2013) about the teacher's role in supporting moral classroom conversations, which are here also recommended.

Promoting transformative learning experiences with videogames is not only a matter of supporting knowledge participation within the single context of the videogame. Introducing experiences that were closer to real life led the students to address problematization with renewed personal investment. Positioning themselves as actors in hypothetical situations outside the game while discussing what to do led to a form of authoring of subsequent decisions at a different level. I recommend the creation of storylines and experiences where the learner recognizes value in both the fictional and real worlds, in line with Barab et al. (2012), since

movement across domains was responsible for increasing engagement at a new level. The learning design should support students and teachers in considering forms of engagement and reasoning that do not simply aim for simple content acquisition. The findings suggest that embedding abstract logical arguments into concrete contexts may improve higher reasoning—something clearly expressed in the anchoring process model.

In the study, the game context, real life, everyday knowledge, theoretical resources and dialogic movements all seemed to combine in GBL to promote learning. Positioning the students in a multiplicity of roles (Silseth & Arnseth, 2016), as both players and students at different moments of the activity also contributed to productive GBL. The study proved that important aspects of the "Thinking Together" program (Wegerif et al., 1998) were significant:

- the situation presented in the game was challenging and puzzling, and the teachers promoted cognitive development by using language that challenged the students' understanding and required them to present reasons for their proposed solutions.
- the students were required to co-construct knowledge while listening to others and challenging others' perspectives;
- at the end of the project, students were invited to reflect on their own thinking and the learning experience.

The underlying goal is to allow the gaming experience to become transformative. This study has shown how the teachers dialogically implemented transformational play by promoting disciplinary engagement when using a game that was not designed for such engagement. The practical relevance of the proposed anchoring process to dialogic teaching and learning with videogames is thus (1) inspired by the need to design and enact productive engaging learning environments that (2) create special engagement conditions for transformational play to happen in relation to (3) the mastery and appropriation of disciplinary content. Design principles in preparing the GBL activities—and, later, the teacher's enacted design—should lead to the progressive appropriation and mastery of disciplinary content, while including a dialogic balancing of any inherent tensions. Filling the gap that will move the idea of *players* playing a *videogame* that presents *moral dilemmas* to *students* learning to make sense of *real-life situations* by using *ethical theories* requires pedagogically advanced design strategies. One strength of these empirical contributions is that the inherent recommendations come from having two countries adapting more or less the same approach. I hope this study empirically contributes to helping other teachers in this design task.

6.4. Conclusions

Few previous studies have analyzed how videogames structure micro-interactions in the classroom in relation to learning. With that intention, the presented study followed two cases of GBL (in Portugal and in Norway) that integrated a COTS videogame in classroom practices to teach ethics and morals in citizenship education. This in-depth study analyzes the importance of the teachers' design of GBL, and results showed how the context and the way in which the game was situated as an educational resource were key to the students' learning process and meaning-making of curricular content. As described in the previous sections, I found the use of a dialogic approach (Bakhtin, 1981, 1986; Alexander, 2008, 2018) very useful to study GBL. Also, sociocultural factors and teachers' designs of learning environments were relevant to

clarifying the relationships between engagement with videogames and learning, as defended by Iacovides et al. (2011).

The main conclusion of this thesis is that well-designed pedagogical practices provide many possibilities for learning using a COTS videogame. The conclusion is based on studies conducted using *TWD* videogame in learning designs that incorporated a dialogic approach. This conclusion is grounded by six main findings:

The first finding is that the **COTS GBL mediated a meaningful learning experience in CE and helped the students to achieve curriculum goals, namely to make sense of a curricular content unit about morals and ethics.** The studied COTS GBL required a) players b) to make moral decisions c) within the game dilemmas, to accomplish the actual underlying curricular learning goal which was to teach a) students b) to make sense of ethical theories c) in relation to real-life situations. This was achieved by mediational means through which students gradually mastered and appropriated the curricular content. Drawing on the anchoring process model, this thesis contributed toward clarifying the importance of the videogame and the teachers' role in terms of facilitating this mediational process.

The second finding is that the **pedagogical practices were well designed in terms of combining both the videogame as an educational tool and the dialogic approach used by the teachers.** On one hand, the videogame narrative led to emotional identification and provided a situated and meaningful context that facilitated interest and connection between fictional and real-life experiences, although it was clear from the results that the teachers' mediational role and instructional design were also important in structuring the learning process.

Learning was an active process of knowledge construction that involved both interactive features and the authoring of a story—it is fair to say that, after presenting the conflicting paradigms of narratology and ludology, this thesis concludes that engagement in GBL was promoted by a combination of both.

The third finding is that **discussions about the videogame worked well when intertwined with the dialogic discussion of conceptual knowledge and of concrete, real-life examples.** Results show that several types of talk were found in the classroom, such as disputional, cummulative and exploratory talk (Dawes, Fisher & Mercer, cited in Mercer & Dawes (2008). Learning was optimized by the use of exploratory talk, which situated the game content in relation to both theoretical content and students´ interests and prior knowledge. However, even when the teacher appeared to use dialogues to guide the students toward an agreement, these agreements were supported by dialogic plurality. In doing so, students must discuss (i.e., present conflicting points of view, or thesis and antithesis) to decide together what should happen in the game, or apparently reach synthesis. Instead of reaching a synthesis, though, both the debates and voting permitted a variety of alternatives to be the correct answers, which is closer to Haworth´s (1999) idea that a dialogic utterance signals reciprocity but not necessarily agreement with another person's meanings. This allowed the plurality of voices that is so important in the democratic values of CE (Schuitema et al., 2011).

The fourth finding, much discussed in Article II, points out how **instructional designs in GBL affected the learning trajectory.** During different tasks with different instructional designs, the students could gradually master and appropriate theoretical content while applying it to a situated, meaningful context. This study corroborates the importance of all the three pedagogical link-making forms referred by Scott, Mortimer and Ametller (2011): supporting

knowledge-building, promoting continuity and encouraging emotional engagement were proved of much importance in meaning-making interactions

The fifth finding, resulting from the fourth, is that the **teachers' instructional designs supplemented the COTS gameplay with a dialogic positioning of the students' content and context in ways that allowed this COTS GBL to become a transformational learning experience**. Results show that the dialogic discussion of the COTS game, namely the teachers' roles and the instructional designs, fostered positioning work that promoted learning in ways that resemble the TP framework. My findings point to the importance of both dimensions of learning design described in Hauge, Lund and Vestøl (2007) and in Lund and Hauge (2011): the results stress that both design for teaching and design for learning actually contributed to conceptually bridging institutional goals and the students´ lives. This bridge, relevant for all school content, is of particular importance in CE which has the ultimate goal of forming human beings that are able to construct a dignifying future society.

The sixth and last finding states that the **teachers' educational designs were crucial in extending the students' engagement beyond the gameplay in ways that promoted them to make sense of the ethical theories along a learning trajectory.** This happened through the dialogic approach, as teachers supported knowledge building by encouraging higher forms of engagement that extended students´ engagement from the game to content knowledge. By extending the students' engagement in these ways, the learning trajectory led them to change their participation and appropriate the disciplinary discourse in different ways, thus turning these factors into useful cultural resources for reasoning about ethics and morals. The process of mastery and appropriation by which the students gradually used mediational means for meaning-making with the purpose of taking a position on game´s moral dilemmas is similar to what Tappan (2006) refers to as moral development.

The solidity of my conclusions is reinforced because the research design and analytical approach in this study relied on well-known theoretical learning concepts in the sociocultural tradition and on earlier frameworks such as TP and PDE. The six main findings extend previous research. Based on this fact, I argue that COTS GBL presents positive potential for learning across contexts by (1) considering the importance of using an anchoring process in collaborative reasoning and dialogic approaches, (2) eliciting positioning for transformational play, and (3) bearing PDE guidelines in mind, while (4) designing for achieving forms of engagement that are simultaneously consequential, critical, and disciplinarily productive.

However, the present study exhibits empirical results that address conflicting theoretical statements. For example, the studied design did not require students to reach agreement. This aligns with the plural and democratic views of CE and is also compatible with the idea of dialogue as an end in itself, as defended by dialogic perspectives. However, this design conflicts with Mercer and Dawes' (2008) idea of exploratory talk and with the benefits of what Littleton and Mercer (2013) call interthinking, which are highly reliant on a convergence with agreement. Strengths of both designs are worthy of further investigation.

Although the learning and teaching design presented in this study did work, this does not mean that this is the only possible good teaching design regarding GBL. I note that other COTS videogames may have features with different learning potential, requiring different learning designs to be implemented. Some of the design aspects that were shown to be positive in this study may themselves create difficulties and should thus be carefully considered in any future

designs. For example, the teacher's constant assistance should be balanced, since such assistance could either support or hinder the students' productive appropriation of knowledge. Even if a large part of the engagement achieved in this study was due to the teachers' enacted design, the fact that videogames represent an innovative practice may also have greatly contributed to the students' engagement. Something to consider is at which point the same engagement level would be achieved once the use of GBL is a commonly established practice among schools (assuming this occurs at some point). Finally, external validity issues emerge from the use of the case-studies design. I assume that the learning benefits of a similar practice will not equally suit all teachers, students, videogames, and certainly not all disciplinary contents.

The study brings dialogic perspectives into the analytic framework of COTS GBL, combating the lack of studies about this and providing a stance different to the main thrust of other studies in the field. However, this study's findings must be viewed with caution, and improvements and adaptations should be considered in future designs. Future researchers should take heed of the demonstrated potential of GBL to connect with learning lives outside of school by studying the durability of intercontextual effects. This is particularly important when using GBL to learn about moral actions and societal ethical contexts, which will ultimately be played beyond the confines of the screen.

We all make choices, but in the end our choices make us.
—Andrew Ryan (*Bioshock* videogame character)

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Appendices

Appendix 1 – Script for semi-structured interview with students.
Appendix 2 – Script for semi-structured interview with teachers.
Appendix 3 – Curricular programs of the school subjects in the two countries.
Appendix 4 – Ethical theories taught in the two countries.
Appendix 5 – Formal authorization for the research project by the regulating authorities in both countries.
Appendix 6 – Formal consent forms.
Appendix 7 – Abbreviations.

Appendix 1 – Script for semi-structured interview with students.

(1) Narrative approach

—When thinking of the game and what happened in these lessons, can you explain to me what happened in the story of the videogame?

(2) **Making sense interview**

—What was most confusing, what questions did you have and what things were you not really sure about?
—What did you think at that time; what ideas crossed your mind?
—How did you feel about it? What emotions came up?
—What can you say you think you learned from this activity with the game?
—What made it easier? What did this help you to decide?
—What in the game made it hard or hurtful?
—In what way does what happen in the game relate to you as a person?
—What about society and power? How do they relate to what happens in the world?
—What does this kind of situation remind you of—from your previous experience, both in the game or real life?
—What did you expect to happen? What was surprising?
—If you could change the situation as you would wish, what would you change?

(3) Exploring the use of videogames in the school context

—What do you think about this activity? The teacher, your colleagues … What was great, and what could have been different somehow?
—Some people say that games are great ways of learning things—what are your comments about that? Do you think this was a good way to learn? What about videogames outside school—is it possible to learn from them?
—Would it be different if the teacher used a novel or a movie to discuss the same issues?
—If so, what is the difference in presenting issues in a videogame?
—Would you recommend videogames as a teaching practice? Why do you think they aren't used more often?

(**4) Linkage to out-of-school use of videogames and moral reasoning (only for the focus group)**

4a. Exploring linkages to other game activities outside school

—Which is your favorite videogame, as a player?
—What makes it such fun to play?
—When playing a videogame, do you feel like you are the character, or just an observer?
—Do you tend to play as yourself, meaning as you would act in such a situation?
—Have you ever played a videogame before that made you wonder about the actions you took?
—If so, can you tell me about them?
—Do you think having moral options is important in a game? Why?

4b. Exploring linkages to moral reasoning in real life

—Think about the moral choices you've made in videogames. Were they difficult?
If so, why were they so difficult?
—When you have to make these choices, what do you think at the moment that makes it easier to choose?
—Can that strategy also apply to real-life decisions? If not, what is it that is different in making choices in videogames versus real life?

(5) Exploring linkage to development of moral reasoning skills

Some people say that games are a bad influence on personality and values; others say they are opportunities for people to develop their social and moral skills. What do you think about that?

Appendix 2 – Script for semi-structured interview with teachers

(1) Teaching background

Could you start by telling me a little about your personal experience as a teacher:
—For how many years have you been teaching?
—What subjects do you teach?

(2) Perceptions about teaching experience

I'd like to know a little more about your own experience in the field of education:
—What do you think makes for good teaching? What are your views on your own teaching style?
—Can you describe a good teacher experience of your own? What works best, and why? What doesn't work so well? Tell me about it.
—What do you think are the main challenges for teachers these days? Personally, from your own experience, what would you say?
—Please provide a brief description of the main approaches you use in the classroom, and what inspires you (theoretical literature, colleagues etc.)

(3) Technology-enhanced education

Major changes in the use of technology in education have now arrived:
—Is the use of technology common in your school? Why is that? And in your teaching?
—How is the national educational system evolving, considering this aspect?
—How important is this usage, in your opinion? And why?
—Have you used media/digital resources in your teaching? Which ones? Why do you use them?

(4) Game-based learning

About the use of the specific technology that is videogames:
—Are you a gamer yourself? How long have you been one? When did you first become interested? Will you use videogames in the future?
—How was the experience of using games inside a classroom?
—How did the students react to it?
—What makes videogames different from use of other media resources?
—What was your concern while implementing the activity—how to prepare the class?
—What worked out well? What was unexpected? What would you do differently next time?
—How do you see this experience in relation to the curricular content of the subject?
—Do you think this practice works well as an educational method? As a teacher, what aspects would you think are important to promotion of good educational practices when using game-based learning?
—What can go right? What can go wrong?

(5) Ethical and moral reasoning

Considering the experience here in the classroom:
—How you would evaluate the moral reasoning provoked by the experience:
(a) of playing the game?
(b) of the discussion?
—What techniques did you try to use in the inquiry/discussion? What worked out better? What didn't work out so well?
—Do you think the students showed some moral reasoning? How did you perceive that? Examples?
—Do you think the students showed any linkages to the curricular content? How did you perceive that? Examples?
—Do you think the class or some of the groups made collaborative achievements?
—How do you see this experience in relation to out-of-school learning and citizenship?

Appendix 3 – Curricular programs of the school subjects in the two countries

Overview of the KRLE curricular content

(adapted from Norwegian Directorate for Education and Training, 2006).

Area I: Theory and criticism of religion	Focuses on the extent of religions and views on life (globally, nationally and locally) and fundamental issues arising from the role of religions in society; introduces analytical tools as a basis for a holistic and balanced understanding of religions.
Area II: Islam and an elective religion	The study of Islam and another elective religion (except Christianity): the ethics of the religions, important texts from each religion, and different disciplines and aesthetic and ritual expressions in those religions; also focuses on the relation between religions and other views on life.
Area III: Christianity	The study of Christianity in all its varieties, and the relationship between Christianity and other religions and views on life.
Area IV: Philosophy, ethics, and views on life/humanism	The study of selected philosophers from a number of epochs and from several regions of the world; looks into ethical concepts and argumentation models and forms the basis for forming one's own opinions and choices.

Overview of the AI curricular content

(adapted from Portuguese Ministry of Education, 2004)

Areas	**Thematic Units**	**Problem-Themes**
Area I: The Person	Logical-psychological subjects	1.1. The construction of knowledge, or the Promethean fire 1.2. People and culture 1.3. Communication and construction of the individual
	Historical-social subjects	2.1. Family structure and social dynamics 2.2. The construction of the social 2.3. Building democracy
	Bio-ecological subjects	3.1. Humans and the earth 3.2. Children of the sun 3.3. Humans and nature: a sustainable relationship?
Area II: Society	The region, Lived space	4.1. Regional identity 4.2. Regions and the national space 4.3. Regional imbalances
	A common house: Europe	5.1. Integration in Europe 5.2. European citizenship 5.3. Cross-border cooperation
	Working life	6.1. Work: its progress and status in Western society 6.2. The development of new attitudes at work and employment: entrepreneurship 6.3. Labor organizations
Area III: The World	Globalization of villages	7.1. Global culture or globalization of cultures? 7.2. A global challenge: sustainable development 7.3. The role of international organizations
	Economic internationalization, knowledge and information	8.1. From world economies to the global economy 8.2. From a multiplicity of knowledge to science as a rational construction of reality 8.3. From Alexandria to the digital era: the dissemination of knowledge
	The discovery of criticism: the universe of values	9.1. Ends and means: what are the ethics of human life? 9.2. The formation of cultural sensitivity and the transfiguration of experience: aesthetics 9.3. The religious experience as an affirmation of the spiritual space in the world

Appendix 4 – Ethical theories taught in the two countries

Ethical theories as presented by the Norwegian teacher

Classification	Theory	Description
Purpose-based theories (teleologic), meaning an act is morally good if it contributes to a good cause	Virtue ethics	A moral action should consider the character traits one wants to achieve (e.g., I choose to help somebody because that is what a virtuous person would do in such circumstances).
	Consequence ethics emphasizing utilitarianism	A good action is one that will allow the best consequences for the greatest number of people (e.g., sacrifice one person's life to save 100 people from death).
Duty-based theories (deontologic), meaning a morally good act is in fact a duty	Duty ethics	A moral action should always consider one's obligations in a certain situation, regardless of the consequences (e.g., saving a life is a universal duty).
	Closeness ethics (which may or may not fall under the same classification of ethical theories)	A moral action should consider proximity to the object (e.g., saving a relative instead of a stranger).

Ethical theories as presented by the Portuguese teacher

Classification	Theory	Description
Purpose-based theories	Psychological egoism	A moral action should reflect one's own individual interests (e.g., considering one's own benefits over those of others).
	Utilitarianism	A moral action should be evaluated in accordance with what will be useful to the greatest number of people (e.g., sacrifice one person's life to save 100 people from death).
Duty-based theories	Deontology	A moral action should consider one's obligations in a certain situation, regardless of the consequences (e.g., saving a life is a universal duty).

Appendix 5 – Formal authorization for the research project by the regulating authorities in both countries

a) Norway

Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

Filipa DeSousa
Institutt for pedagogikk Universitetet i Oslo
Postboks 1092 Blindern
0317 OSLO

Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel: +47-55 58 21 17
Fax: +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr. 985 321 884

Vår dato: 10.03.2014 Vår ref: 36730 / 3 / JSL Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 17.12.2013. Meldingen gjelder prosjektet:

36730	*Videogames and Moral Reasoning in Educational Settings*
Behandlingsansvarlig	*Universitetet i Oslo, ved institusjonens øverste leder Daglig ansvarlig Filipa DeSousa*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://pvo.nsd.no/prosjekt.

Personvernombudet vil ved prosjektets avslutning, 16.08.2017, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Katrine Utaaker Segadal

Juni Skjold Lexau

Kontaktperson: Juni Skjold Lexau tlf: 55 58 36 01
Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 36730

Data will be collected from the following sources:
Questionnaire for students (document received)
Personal in-depth interview with teachers and students (document received)
Group interviews with students (same document as personal interviews will be used)
Observation in class-rooms while the pupils play video games, with the help of audio- and video recordings
Journal data (for example power points or hand outs used by teacher, students texts or other productions they might perform in relation to the class activities)

According to your e-mail sent on February 28th 2014, the camera will be positioned in such a way that only students that have given their consent for participation, will be recorded. We remind you that also audio recordings on a video recorder can be identifiable. Video recordings cannot be taken in a normal class-room unless everyone present have given their consent. Alternatively, the class could be separated into different groups, so that only the participants will be recorded.

We presuppose that the teacher do not give identifiable information about students, since this is confidential and part of the teachers professional secrecy.

The sample will receive written and oral information about the project, and give their consent to participate. Students above 15 can consent by themselves in a Norwegian context. The revised letter of information, received by e-mail on February 28th is well formulated. We still ask you to explain what students that do not want to participate will do while the others participate (see our comments above regarding audio/videorecordings). You should also specify whether all the data from a person will be kept for illustrations, or only some sections, and explain if the illustrations will be identifiable or not.

The Data Protection Official presupposes that the researcher follows internal routines of Universitetet i Oslo regarding data security.

Estimated end date of the project is 16.08.2017. According to the Information Letter, most of the collected data will be made anonymous by this date. Making the data anonymous entails processing it in such a way that no individuals can be recognized. This is done by:

- deleting all direct personal data (such as names/lists of reference numbers)
- deleting/rewriting indirectly identifiable data (i.e. an identifying combination of background variables, such as residence/work place, age and gender)
- deleting audio/video recordings

Some (or all) of the material will be used for illustrations when presenting the findings, if the participants give their consent.

b) Portugal

Monitorização de Inquéritos em Meio Escolar

Início » Consultar inquéritos » **Ficha de inquérito**

Identificação da Entidade / Interlocutor

Nome da entidade:
Universidade de Oslo - Departamento de Educacao - Grupo de Investigacao InterMedia

Nome do Interlocutor:
Filipa Ferreira Dinis Monteiro de Sousa

E-mail do interlocutor:
f.d.sousa@iped.uio.no

Dados do Inquérito

Número de registo:
0426200001

Designação:
Videojogos e Raciocinio Moral

Descrição:
O projecto incluira dois estudos de caso - um numa escola secundaria norueguesa (a definir em 2015) e outro numa escola secundaria portuguesa. Em Portugal a recolha de dados decorrerá na Escola Secundaria Marques de Pombal (Lisboa) – numa só turma de 11º ano na disciplina de Area de Integracao. Todos os alunos tem mais de 18 anos. Os alunos jogarao videojos em sala de aula e a professora promoverá debate sobre as opções realizadas no jogo, relacionando com conteudos ético-morais. Todos os dados serão tratados de acordo com normas éticas, de acordo com o descrito na nota metodológica anexa.

Objectivos:
Compreensao dos processos de aprendizagem cooperativa em sala de aula, especialmente no que respeita a utilizacao de meios tecnologicos e digitais, particularmente jogos, para a promocao de raciocinio moral.

Periodicidade:
Pontual

Data do inicio do período de recolha de dados:
22-04-2014

Data do fim do período de recolha de dados:
27-05-2014

Universo:
Alunos do ensino secundário

Unidade de observação:
Turma de 11o ano - Escola Secundária Marquês de Pombal - Lisboa

Método de recolha de dados:
Questionário; Entrevista a professor e alunos; Observacao de aulas (video e audio gravacao)

Inquérito registado no Sistema Estatístico Nacional:
Não

Inquérito aplicado pela entidade:
Sim

Instrumento de inquirição:
04262_201404091200_Documento1.docx (DOCX - 41,85 KB)

Nota metodológica:
04262_201404091200_Documento2.docx (DOCX - 17,17 KB)

Outros documentos:
04262_201404091200_Documento3.pdf (PDF - 1,01 MB)

Data de registo:
09-04-2014

Dados adicionais

Estado:
Aprovado

Avaliação:
Exmo(a) Senhor(a) Dr(a) Filipa Ferreira Dinis Monteiro de Sousa
Venho por este meio informar que o pedido de realização de inquérito em meio escolar é autorizado uma vez que, submetido a análise, cumpre os requisitos, devendo atender-se às observações aduzidas.
Com os melhores cumprimentos
José Vitor Pedroso
Diretor de Serviços de Projetos Educativos
DGE

Observações:
a) A realização do Inquérito fica sujeita a autorização da Direção do Agrupamento de Escolas do ensinopúblico a contactar para a sua realização (Escola Secundária Marquês de Pombal). Merece especial atenção o modo, o momento e condições de aplicação dos instrumentos de recolha de dados em meio escolar, devendo fazer-se em estreita articulação com as Direções das Escolas/Agrupamentos que autorizem a realização do estudo.
b) Devem ser cumpridas as disposições constantes da autorização nº 3712/2014 da Comissão Nacional de Proteção de Dados (CNPD) de 8 de abril de 2014.

Outras observações:
Sem observações.

mime.gepe.

mime.gepe.min-edu.pt/Private/InqueritoConsultar.aspx?id=5437

COMISSÃO NACIONAL
DE PROTECÇÃO DE DADOS

AUTORIZAÇÃO Nº 3712/2014

I. Do Pedido

Filipa Ferreira Dinis Monteiro de Sousa, investigadora doutoranda na Universidade de Oslo, Departamento de Educação da Faculdade de Ciências Educacionais – Grupo de Investigação InterMedia, notificou à CNPD um tratamento de dados pessoais com a finalidade de realização de um estudo relativo a jogos de computador na atividade educativa.

O objetivo do estudo é a compreensão dos processos de aprendizagem coletiva em sala de aula, especialmente no que respeita à utilização de meios tecnológicos e digitais. Serão incluídos dois *estudo de caso*, relativos a uma escola secundária norueguesa e a uma escola secundária portuguesa.

Os dados serão recolhidos através da aplicação de um questionário aos alunos, entrevistas ao professor e aos alunos e observação dos alunos em ambiente de sala de aula enquanto jogam videojogos, com recolha de imagens e som.

O estudo, em Portugal, será realizado na Escola Secundária de Marquês de Pombal em Lisboa, aos alunos de maior idade de uma turma do 11º ano de escolaridade na disciplina Área de Integração.

Os participantes serão identificados por um código, não havendo identificação nominal do titular. A correspondência entre o código de cada respondente e os dados de identificação ficará registado num ficheiro separado, apenas acessível à investigadora. No final do projeto, os elementos que permitam o relacionamento da informação serão destruídos. De igual modo as gravações áudio e vídeo apenas poderão se mantidas até à defesa da tese.

A investigadora solicitará o consentimento informado aos jovens, cuja declaração será conservada na respetiva escola, em local de acesso reservado.

COMISSÃO NACIONAL
DE PROTECÇÃO DE DADOS

As questões que compõem o questionário não são de resposta obrigatória, pelo que os estudantes poderão deixar questões por responder ou abandonar o questionário a qualquer momento.

Aos titulares dos dados é assegurado o direito de conhecer e corrigir os dados que lhes respeitem.

Serão recolhidos os seguintes dados:

- No questionário aos alunos – código de identificação, sexo, idade, profissão/ocupação pais, local onde costuma jogar (casa, escola, outro), opinião sobre os videojogos, preferências de videojogos, quanto tempo habitualmente joga.

- Na entrevista ao professor – não há identificação, opinião sobre os videojogos, hábitos de utilização videojogos na sala de aula, opinião sobre actividade desenvolvida pela investigadora na sala de aula.

- Nas entrevistas aos alunos – código de identificação, opinião sobre a actividade desenvolvida pela investigadora na sala de aula

- Nas gravações – Imagem e som dos alunos em ambiente de sala de aula enquanto jogam videojogos.

O projeto terá a duração até agosto de 2017.

Haverá transferência de dados para a Noruega, na medida em que a investigadora está a realizar o doutoramento na Universidade de Oslo. A Noruega está inserida no Espaço Económico Europeu, estando, nessa medida, assegurado um nível de proteção de adequado reconhecido pela Comissão Europeia.

II. Análise

Porque em parte referentes à vida privada, os dados recolhidos pela requerente têm a natureza de sensíveis, nos termos do disposto no n.º 2 do artigo 7.º da LPD.

COMISSÃO NACIONAL
DE PROTECÇÃO DE DADOS

Em regra, o tratamento de dados sensíveis é proibido, de acordo com o disposto no n.º 1 do artigo 7.º da LPD. Todavia, o tratamento de dados é permitido quando exista uma disposição legal que consagre esse tratamento de dados, quando por motivos de interesse público importante o tratamento for indispensável ao exercício das atribuições legais ou estatutárias do seu responsável ou quando o titular dos dados tiver prestado o seu consentimento.

Não estando preenchidas as duas primeiras condições de legitimidade, para a realização deste tratamento de dados é necessário o consentimento expresso do titular, entendendo-se por consentimento qualquer manifestação de vontade, livre, específica e informada, nos termos da qual o titular aceita que os seus dados sejam objeto de tratamento, o qual deve ser obtido através de uma "declaração de consentimento informado " onde seja utilizada uma linguagem clara e acessível.

Nos termos do artigo 10.º da LPD, a declaração de consentimento tem de conter a identificação do responsável pelo tratamento e a finalidade do tratamento, devendo ainda conter informação sobre a existência e as condições do direito de acesso e de retificação por parte do respetivo titular.

O fundamento de legitimidade é o consentimento dos titulares dos dados. Porque há recolha de dados de menores, terá de haver consentimento a prestar pelos legais representantes. Os próprios menores devem ser ouvidos, e prestar o seu assentimento, atendendo à sua idade e maturidade. O estudo deve ter em conta o superior interesse das crianças.

A informação tratada é recolhida de forma lícita (cfr. alínea a) do n.º 1 do artigo 5.º da LPD), para finalidades determinadas, explícitas e legítimas (cfr. alínea b) do mesmo artigo).

Contudo, no que respeita à recolha de imagens e som importa adotar procedimentos que garantam que os estudantes, ou os seus representantes legais, que não tenham

COMISSÃO NACIONAL
DE PROTECÇÃO DE DADOS

consentido na participação no estudo não sejam abrangidos pelas gravações de áudio e vídeo.

III. Da Conclusão

Em face do exposto, a Comissão Nacional de Protecção de Dados (CNPD) autoriza o tratamento de dados pessoais *supra* apreciado, nos termos do n.º 2 do artigo 7.º, da alínea a) do n.º 1 do artigo 28.º e do n.º 1 do artigo 30.º da LPD, consignando-se o seguinte:

Responsável pelo tratamento: Filipa Ferreira Sousa

Finalidade: Estudo relativo a jogos de computador na atividade educativa.

Categoria de Dados pessoais tratados: código de identificação, sexo, idade, profissão/ocupação pais, local onde costuma jogar (casa, escola, outro), opinião sobre os videojogos, preferências de videojogos, quanto tempo habitualmente joga, hábitos de utilização videojogos na sala de aula, opinião sobre actividade desenvolvida pela investigadora na sala de aula, imagem e voz.

Entidades a quem podem ser comunicados: Não há.

Formas de exercício do direito de acesso e retificação: Junto da investigadora.

Interconexões de tratamentos: Não há.

Transferências de dados para países terceiros: Noruega Departamento de Educação da Faculdade de Ciências Educacionais – Grupo de Investigação InterMedia – da Universidade de Oslo.

Prazo de conservação dos dados: O código atribuído ao aluno, bem como as imagens e som recolhidos, devem ser destruídos um mês após o fim do estudo.

Lisboa, 08 de abril 2014

Maria Cândida Guedes de Oliveira (Relatora)

Appendix 6 – Formal consent forms

Request for participation in the research project "Videogames and Moral Reasoning in Educational Settings"

I am a research fellow from the University of Oslo, working in the Department of Education and part of the InterMedia Research Group. As a research group we investigate learning and communication with digital representations within and across different contexts, including schools, museums and workplace settings. We are developing research into student learning in ICT with an emphasis on the interplay between technology, academic content and teaching methods. Part of this project is aimed at the use of computer games as technology for collaborative learning.

In the present project I seek to observe how teachers can use videogames in a school setting, to address moral and social issues involving secondary school students. We will select participants both in Portugal and in Norway, and we wish to invite you to be a participant in this research project.

What does participation in the project imply?

In addition to ordinary observation of classroom activities, we will video- and audio-record classroom activities while using the videogame *The Walking Dead*, which includes some violent content, for the purpose of discussing morality issues. We wish to interview students and teachers, and to ask you to fill out a questionnaire. We would also like you to share with the research team any work/production you might develop in relation to these activities. In the interviews we will ask about the experiences with the use of technologies and will clarify aspects that were addressed in the classroom activities. We are not looking for right or wrong answers, only to understand how students and teachers work with videogames for the purpose of discussing moral and social issues.

What will happen to the information about you?

All personal data will be treated confidentially. Our role as researchers means that we are subject to strict ethical rules on how data can be used. The footage of students and teachers will be treated confidentially and will only be used for research purposes. We would like your permission to observe, take pictures and make audio and video recordings. We ask for permission to use the audio-visual material as illustrations in articles and in speeches, but where people cannot be identified. At the end of the project the data will be deleted if you do not consent to its continued storage for use as illustrations.

Voluntary participation

Participation in the study is voluntary, and you can withdraw from participation at any time without stating any reason or providing further justification. If you do not wish to participate, we will place the camera in such a way that you will not be included in the video recordings, and we will not collect any material related to you or where you could be identified. If you decide to withdraw in the middle of the project, all your personal data will be made anonymous. Your school situation will not be affected by whether you wish to participate in the project or if, at a later date, you decide to withdraw. Your participation in this research project will also imply your parents' and school management's consent. They can at any time request any additional information.

If you have any further questions, please contact research fellow Filipa de Sousa on Tel.: +47 93999932, or send an email to: f.d.sousa@iped.uio.no.

We hope you will give us the necessary permission by signing this letter.

Sincerely,

Filipa De Sousa
Research fellow
InterMedia, University of Oslo

***

Consent for participation in the research project "Computer Games in School and Moral Issues"

Name of student/teacher: _____

Name of the school: _____ Class: _____

I have received information about the project, and I am willing to participate:

Signature (participant): _____

Date: _____ / _____ / _____

[ ] Yes, I / we give permission for the interview data and any audio-visual material (picture and video) collected to be applied in the research project. The data will be anonymized upon project completion (16 August 2017).

[ ] Yes, I / we agree to storage of videos and pictures after project completion (16 August 2017) and to their use as illustrative material.

Appendix 7 – Abbreviations

AI – Area de Integração (Integration Area)

CE – Citizenship education

COTS – Commercial off-the-shelf

COTS GBL – Game-based learning using COTS videogames

GBL – Game-based learning

ICT – Information and Communications Technology

IDRF – Initiation-discussion-response-follow-up

IRF – Initiation-response-feedback

KRLE – Kristendom, Religion, Livssyn og Etikk [Christianity, Religion, Philosophies of Life and Ethics]

PDE – Productive disciplinary engagement

RQ – Reseach question

TP – Transformational play

TWD – The Walking Dead

TA – Thematic Analysys

UNESCO – United Nations Educational, Scientific and Cultural Organization

I

II

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Full length article

Zombies and ethical theories: Exploring transformational play as a framework for teaching with videogames

Filipa de Sousa*, Ingvill Rasmussen, Palmyre Pierroux

Department of Education, University of Oslo, P.O. Box 1092 Blindern, 0317 Oslo, Norway

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ABSTRACT

Videogames are included among the wide array of digital resources available to teachers to foster student engagement and teach domain-specific content. In this study, we analyze how two teachers in two countries used the commercial videogame *The Walking Dead*™ to teach ethical theories in upper secondary citizenship education. In both cases, students collaborated in playing the videogame, and teachers led whole-class and small-group discussions to relate the game narrative to the curriculum. However, the analysis identified two different instructional designs and dialogic approaches to integrating the videogame with other educational resources. Extending the concept of *transformational play*, the analysis showed how the respective teaching approaches supported student learning and engagement by facilitating different types of positioning work.

1. Introduction

Young people worldwide play commercial videogames, and in many countries, teachers are exploring the use of videogames to foster student learning. In this paper, we analyze how two teachers, one from Norway and one from Portugal, used the same commercial videogame to teach ethics in citizenship education at the upper secondary level. The teachers designed similar activities for the curriculum, which involved collaboratively playing the videogame in class. Both teachers paused the game at decisive narrative moments and led discussions of moral dilemmas in relation to ethical theories in the curriculum. The questions raised in this study are based on an overall interest in exploring how teachers plan and enact the use of commercial videogames, and digital technologies more broadly, as resources for learning in formal education. Videogames have a special status as a digital learning resource because they offer new types of "worlds" in which players experience the consequences of their actions in the unfolding of a story or the solving of a quest, challenge or problem, as these are displayed on a screen (Barab, Gressalfi, & Arici, 2009). Researchers also point to videogames as powerful learning resources for promoting digital literacy and other twenty-first century skills because adolescents identify with this resource (Erstad, 2013; Gee, 2003; Hull & Schultz, 2001).

Yet much has been written about whether commercial games can be productively used in formal education (e.g., de Freitas, 2006; Linderoth, 2012; Selwyn, 2016). Concerns have been raised that commercial videogames are not good learning environments because they are designed for entertainment rather than for learning in formal education, and many of them present violent content (Linderoth, 2012). Instead, *serious games* should be used in school (Marino & Hayes, 2012), as they are designed for learning in a specific knowledge domain, integrating curricular content while maintaining the engagement aspects of gameplay (Sanchez, 2013). Serious games, if properly designed, provide educationally relevant and problem-rich environments, tools, and experiences that ensure learners will develop rich content understandings (Barab, Gresalfi, & Ingram-Goble, 2010).

* Corresponding author.
E-mail address: f.d.sousa@iped.uio.no (F. de Sousa).

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In this paper, we explore the premise put forth in the research that in addition to being entertaining, commercial videogames often have designs that are based on educational principles that foster cognitive and social skills (e.g., Squire, 2005). Videogames can, for example, involve students in adopting different perspectives through role-play that invites them to assume different identities in the game. Gee (2003) posits a tripartite play of identities: a virtual identity (the character), a projective identity (how the values of the player are projected in the character) and multiple real-world socio-cultural identities (who the player is in real life and who she intends to become). This approach has been influential in empirical studies showing how players' ethical understandings develop as they explore new identities in gameplay (Edmiston, 2008). In the virtual identity, the learner makes, and is accountable for, choices with underlying values and goals that have been pre-programmed, and the projective identity must navigate the relationship between the different identities. Furthermore, immersion in a story or a game character may lead to learning the story's "moral" (Baranowski, Buday, Thompson, & Baranowski, 2008; Ryan, Scott Rigby, & Przybylski, 2006).

Regardless of the stance on whether serious or commercial games are appropriate for formal education, there is general consensus that the teacher's role is central in promoting discussions that invite questioning and multiple viewpoints, engaging students in making justifications that are relevant to learning by relating domain-specific content to the gameplay (Arici, 2008; Barab, Pettyjohn, Gresalfi, Volk, & Solomou, 2012; Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010; Gresalfi & Barab, 2011; Hanghøj, 2013). However, teachers' learning aims for gameplay are not always made explicit for students (Squire, 2005). A meta-analysis found that serious games are more effective when integrated with teacher-led discussions that prompted students to verbalize knowledge and make connections to previous knowledge (Wouters, Van Nimwegen, Van Oostendorp, & Van Der Spek, 2013). This finding is also emphasized in the literature on simulations (e.g. Kriz, 2010). Within this field, studies have provided insights into how simulators may serve as productive environments for training professional action, and how such environments also provide teachers opportunities to connect student assessments more directly to these enactments (Sellberg & Lundin, 2017). Another central finding is that the teacher's role and instructional design for' briefing and debriefing' simulator lessons is key to the effectiveness of simulators as learning environments (Hontvedt, 2015). This finding aligns with a number of empirical studies showing that teachers' class dialogues are particularly important to learning from games (serious or commercial), as connections to domain-specific content must be made explicit: "In play, the consequences of actions and learning only have relevance within the confines of the game" (Jahreie, Arnseth, Krange, Smørdal, & Kluge, 2011, p. 238). In other words, support and progression might be incorporated into the game design, but empirical findings stress that students depend on their teachers to make links between the game and curricular content (Hanghøj & Brund, 2010; Silseth, 2012). Students need instructional assistance to understand knowledge representations that may be tacitly embedded in games, textbooks, and other resources (Gilje et al., 2016; Rasmussen & Ludvigsen, 2010). In sum, extensive research shows that the intended, often advanced designs of digital learning resources like serious games and simulations does not assure that learning takes place. Rather, the productive use of digital technology, including commercial videogames in formal learning settings, also relies on how the resource is integrated into the teacher's enacted design – where teacher's dialogic interactions with students is a key issue (Mercer & Howe, 2012; Rasmussen & Ludvigsen, 2010).

To study teachers' use of videogames as resources for learning in classroom settings, we draw on an analytical framework that explicitly addresses the learning potential in game-based learning (GBL). This framework is called *transformational play* (TP), and was developed for the learning designs of serious games (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010). We adapt this framework in an empirical investigation of how two upper secondary school teachers integrated a commercial videogame with other educational resources in lessons on ethical theories, with a particular focus on the teachers' dialogic interactions and enacted learning designs.

2. Analytical framework: A dialogic approach to transformational play

There are three key principles that characterize *transformational play* (TP). First, role-playing facilitates the *positioning of persons with intentionality* (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010) in ways that support critical reflection and the experience of multiple perspectives; players perceive themselves as protagonists who have the responsibility to make choices that will impact the game's story. Second, TP encourages players to use theoretical content to solve problems in the game's setting. Barab et al. (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010) described this as *positioning content with legitimacy*. In designs for GBL, subject content and conceptual understanding are positioned as situated knowledge. This means they are used within the game's setting as legitimate and valid resources for solving problematic situations as they unfold. Positioning content in this way transforms students' understanding because they become aware of concrete practical applications and broader meanings across contexts. The third aspect of TP is *positioning context with consequentiality* (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010). Game environments depend on players' actions, allowing the players to judge the consequences of their actions as the story unfolds in response to their decisions. In designing for TP, game elements must be combined in ways that create consequential learning spaces for the player to act as a protagonist and to apply theoretical content to solve problems as they arise. Together, the narrative, role-playing, content, and interactive design elements create a context in which players' choices have meaning and consequence (Barab et al., 2012). TP may thus be described as a normative framework for thinking about the design of serious games and curricular units, identifying aspects that can contribute to learning when designing educational games (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010). We extend TP principles to the study of commercial videogames as learning resources in teachers' instructional designs, by employing the concepts of positioning person, content, and context in the analysis of dialogic interactions in two different classrooms.

Our focus on dialogue entails investigating the ways the teachers facilitate transformational play while dialogically promoting participation and discussion among students (Mercer & Howe, 2012). Building on sociocultural approaches and activity theory, TP

underlies the idea that learning in videogames involves active participation (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010). Reasoning and knowing are seen as distributed acts that exist in the flow of activities as people interact with others and with social, physical, and knowledge resources. Dialogical approaches entail listening, reformulating, challenging points of view, and collaboratively building arguments from group discussions (Wegerif, 2011). Dialogue promotes what Bakhtin (1981) called the inter-animation of different voices that allows meanings to emerge and develop through talk. Wegerif (2007) points to the benefits of opening dialogic spaces to deepen and broaden reflection when learning with technology, and seems especially important when using games or simulations as educational resources.

2.1. Meaning making in citizenship education

Dialogical teaching approaches are particularly relevant for citizenship education. Studies indicate the need to support students in both mastering ethical theory concepts and using them to reason about various moral issues that can entail emotional or personal involvement. In a study of the teacher's role in promoting active enrolment in classroom conversations about moral issues, Willems, Denessen, Hermans, and Vermeer (2013) qualitatively compared teachers' conversations in four classroom settings and found that of primary importance were (a) leading students to be morally reasonable, (b) stimulating their emotional involvement, and (c) guiding them toward a normative ideal of virtue. These aspects of moral reasoning are also relevant in the curriculum and teaching approaches studied in this paper.

A model of dialogical teaching, according to Alexander (2006), entails a sequence of talk in which (a) the teacher poses questions that are framed to elicit reflection; (b) answers point to new questions in a reflexive chain; and (c) the teacher supports students' learning by weaving their contributions into a coherent whole. In studies of teacher-led discourse in classroom settings, Mercer described productive interactions as, “co-reasoning, in which speakers share relevant knowledge, challenge ideas, evaluate evidence, consider options, and try to reach agreement in an equitable manner” (Mercer, 2008, p. 95). However, in citizenship education, it has been noted that teacher-led interventions to achieve agreement might not be the most useful dialogical strategy in this subject area, because moral and citizenship education are domains where a plurality of perspectives and opinions are highly valued (Schuitema, van Boxtel, Veugelers, & ten Dam, 2011); the quality of students' reasoning in class was key to their later ability to justify viewpoints on moral issues. Wertsch (1998) embraced this nuance in his notion of *meaning making*, which makes the subtle distinction between the *mastery* of factual or conceptual information and the personal *appropriation* of knowledge in learning processes, through which understanding is made “one's own.” We draw on this nuance in our analysis of how teachers dialogically support student learning in ethics and citizenship education using a popular commercial videogame. Given the central role of dialogic interaction when learning with videogames, then, we focus on how dialogue between teacher and students is structured and related to the game's *narrative structure* and *content*. These have been noted as the distinguishing features of videogames compared to other digital resources used in classrooms (Barab et al., 2009). The following research questions are addressed:

- How was the commercial videogame integrated with other educational resources by the teachers in the two classrooms?
- What kind of positioning work, key to transformational play, was accomplished through the teachers' dialogic interactions and the enacted learning designs?
- In which ways did the teachers' dialogic interactions support meaning making in citizenship education and ethics?

The inclusion of two different cases from two different countries is interesting given that the use and popularity of videogames are global. The aim is neither to perform a comparative study nor to identify national trends or tendencies, but rather to contribute to international research on the potential of GBL to foster adolescents' engagement in and dialogue about curriculum content. Studying two teachers' approaches to GBL allowed a richer analysis of such dialogic interactions.

3. Method

3.1. The videogame: The walking dead™

The Walking Dead™ is a popular commercial role-playing videogame, where players control a male convicted murderer who is ‘on the run’ from the authorities and has taken responsibility for a little girl. Together, they travel through a zombie apocalypse scenario. To survive, players must make difficult choices. The game was not created for educational purposes, but the teachers viewed it as interesting for teaching ethics because the content presents difficult moral dilemmas and the player's agency impacts the story's narrative. *The Walking Dead*™ is used worldwide and contains universal dilemmas (e.g., to lie or not to lie), further reinforcing the value of studying this activity across countries. The teachers complemented the videogame with other game-like apps (*Geddit*™ and *Kahoot*™) to collect students' opinions and votes at key moments.

3.2. Domain-specific content: Citizenship education and ethical theories

A disciplinary focus on citizenship practice as ‘active and critical engagement’ (Haydn, 2012) is found in curriculum guidelines for citizenship education in different countries (Advisory Group on Citizenship, 1998). In Norway, we followed a class in the subject “Knowledge of Christianity, Religion, Philosophies of Life and Ethics.” This subject uses philosophical models as tools for analyzing and reflecting on ethical challenges (Norwegian Ministry of Education, 2015). In Portugal, we followed a subject called “Integration

Area," which points to the integration of knowledge from several disciplinary fields (Portuguese Ministry of Education, 2004). In both countries, we followed classes during a curricular unit on ethical theories. Classification systems of ethical theories differ (Vestøl, 2004), as did the curricular content covered by teachers in the two countries. In Portugal, the ethical theories covered were *utilitarianism*, choosing the action that is useful to the greatest number of people; *psychological egoism*, acting in one's own individual interests; and *deontology* (also called *duty ethics*), the duty of acting according to universal good will toward others. In Norway, the teacher presented the following theories: *virtue ethics*, the moral action is whatever a virtuous person would do under the circumstances; *closeness ethics*, considering the proximity of the object (e.g., saving a relative instead of a stranger); and *utilitarianism* and *duty ethics*. As mentioned, the two teachers designed similar activities for the curriculum, which involved collaboratively playing the videogame in class, pausing, and discussing decisive moments to make moral decisions based on ethical theories for further action.

3.3. Contexts

The Norwegian class included 26 students (20 boys and six girls, 17–19 years old) in their third year at a regular upper secondary school. The teacher, a man in his late 20s, commonly used technology in his classes and designed the GBL practice that we studied. The students had previous experience with GBL because their school encouraged such pedagogical methods. In Portugal, we followed a smaller class (five boys and nine girls, 18–22 years old) in their second year of a vocational upper secondary program. The higher age of the students might be explained by difficult school trajectories, including lack of motivation, absenteeism, disciplinary problems, and poor grades. The teacher, a woman in her late 40s, was not accustomed to technology-enhanced teaching practices but decided to participate in the study because she believed GBL could help combat students' motivational problems. The participating students had no prior experience with GBL. In the Norwegian case, the activity took place in a regular classroom equipped with all the necessary ICT equipment, while in the Portuguese school the class moved to the school's ICT room to allow one-to-one access to computers.

3.4. Data and analytic approach

Data collection in both schools started with the curricular unit and covered the first five "dilemmas" presented in the videogame. The core data collection combined observations with video recordings (459 min in Norway and 487 min in Portugal). This data were supplemented with ethnographic data, including audio recordings of post-interviews, pictures, student products, and extensive field notes. In keeping with our theoretical framework and research questions, the integration of the whole data corpus, including supplementary data, allowed for detailed descriptions of the settings, the framing of dialogue, and the interactions and activities across the different contexts (Paterson, Bottorff, & Hewat, 2003).

In the analytical approach, we first used methods inspired by thematic analysis (Braun & Clarke, 2006) to organize the data and to identify initial patterns of classroom interaction and dialogue within the data corpus (Ong-Flaherty, Valencia-Garcia, Martinez, Borges, & Summers, 2017). These concerned how the two teachers organized the gameplay, and particularly how the gameplay was integrated with other activities and resources. This inductive process allowed us to work with identified patterns of interaction to develop a description of how the GBL trajectories unfolded over time. Second, we selected excerpts in which dialogue seemed to mediate learning related to the curriculum and to the five dilemmas presented by the game. The excerpts were first transcribed in their original languages and then translated into English. In keeping with research on established patterns of classroom talk (e.g. Alexander, 2006; Mercer & Howe, 2012), we included both whole-class and small-group discussions. In the third phase of the analysis, we narrowed the focus and used micro-analytic approaches inspired by Jordan and Henderson (1995) to analyze dialogue and gameplay as an interactional accomplishment. This entailed analyzing utterances sequentially as "turns" through which the "inter-animation of different voices" (Bakhtin, 1981) allowed meanings to emerge and develop (Bakken & Pierroux, 2015; Enqvist-Jensen, Nerland, & Rasmussen, 2017). The unit of analysis thus comprised moment-to-moment interactions embedded in class dialogues about ethics and moral reasoning, with the videogame as one of several contextual resources. In the fourth phase, we interpreted the data from the perspective of transformational play (Barab, Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010; Barab et al., 2012), extending principles for game design to the study of game-based learning in classroom settings. The analytical focus here was on the ways in which teachers enacted the positioning of person, content, and context to transform gameplay into learning experiences.

In sum, this framework allowed us to account for aspects of infrastructure, dialogical moves, and meaning making in the analysis. The two cases are complementary in the sense that they support and inform analyses and interpretations in relation to the themes in focus (Yin, 2014). In presenting the analysis of GBL, we identify what characterizes both differences and similarities, and we provide a rich description of how videogames and other classroom resources influence dialogic interactions and meaning making across the two contexts and between teachers.

4. Analyzing dialogic interactions and the use of a videogame as transformational play

4.1. Infrastructure and organization of educational resources

Different approaches to integrating the commercial videogame with other educational resources in classrooms were apparent in how the respective teachers organized activity sequences, or their "enacted designs". Specifically, the two teachers organized activities differently in terms of the sequence and integration of the videogame with concepts, tasks, and other resources. In the

Portuguese case, the teacher presented all the ethical theories *before* introducing the videogame, using whole-class discussions and traditional resources (written handouts). The pace of gameplay was slower and the use of technology was limited to gameplay and voting using the *Kahoot*™ app. The Norwegian teacher instead opted for a very brief introduction, and used each of the game pauses to present a PowerPoint on the theory he believed best suited to that specific dilemma. The students then discussed possible game moves in small groups, having been instructed to use this theory as the main reasoning framework. After the small-group discussion, the students were invited to present their conclusions to the whole class. Then, using the digital app *Geddit*™, they individually voted to decide what should happen next in the game. Occasionally, during the theoretical explanations, students were asked to log in to *Geddit*™ and register their own comments and opinions, or to self-evaluate their theoretical understanding of the topic. The teacher in the Norwegian class used a tablet interface to alternate between the videogame and PowerPoint slides presented on an interactive whiteboard, while frequently calling on the students to use their personal laptops and smartphones to respond or comment on *Geddit*™. In sum, analysis of the infrastructure, sequencing of tasks, and organization on educational resources identified the following activities in both settings:

- *Gameplay*: For long periods, the students collaborated on operating the controls while the game action was projected on a large screen.
- *Theoretical explanations*: Teachers provided theoretical explanations of curricular content to be integrated with the game activity.
- *Discussion*: Teachers organized instruction with discussion as a prime activity, pausing the game at key moral dilemma decision moments and leading students in discussions of possible actions.
- *Voting*: Following a period of discussion, students voted individually on what to do next in the game. The game action would then resume based on the majority decision on how to proceed. Voting entailed the use of digital apps, where students could select among possible options (formulated by the teachers to represent different theoretical positions).

Dialogues in the whole class and small group settings were also organized differently in the two cases. The two teachers used both closed and open approaches. Closed approaches refer to when students were instructed to consider only one ethical theory when discussing a dilemma, which was more frequently done in the Norwegian case. Open approaches refer to when students were invited to freely present arguments drawing on any or all the possible theories they had covered, which was more common in the Portuguese case. In the section below, we delve deeper into the empirical material to analyze what kind of positioning work, key to transformational play, was accomplished through the teachers' different instructional and dialogical approaches. We present an excerpt from the Portuguese case that illustrates 'positioning person,' an example from the Norwegian case as 'positioning content,' and finally 'positioning context' is exemplified using excerpts from both cases. The excerpts were selected from the data corpus because they all involve discussions of ethics concepts, thus providing insight into how meaning making was supported in the different conditions.

4.2. Positioning person

Transformational play requires players to position themselves in the role of protagonists who are able to make decisions in a fictional context (Barab et al., 2012). In *The Walking Dead*™, the players frequently assumed the identity of the main character. However, our analysis shows that the class discussions also contributed to person positioning because both students and teachers used the first person when referring to the characters' activities. The teachers in both cases frequently used the plural pronoun "we" to refer to the students' collaborative decision process: "What should we do here?" Such questions and person positioning were used to initiate debate, but also to scaffold group discussions. This agentive positioning engendered the use of hypothetical or actual examples from real life in discussions, as illustrated in the excerpt below.

In the videogame, Lee, the main character, and Clementine, the girl he is caring for, arrive at a farm and are seeking shelter. Hershel, the owner, has some doubts about letting them stay for the night. He starts asking troublesome questions about Lee's past, introducing a moral dilemma in which Lee must decide whether to tell the truth to Hershel. This dilemma is the first pause in the game. At this point, the Portuguese students had been playing the game for 45 min. The teacher invited the students to have an open whole-class discussion and to freely express their opinions about what should be done. This discussion lasted 18 min. Prior to the following excerpt, a student had just pointed out that lying is important for Lee to survive:

Excerpt 1. "Should we lie to Hershel?"

1	Teacher:	So we lie ((*shakes right shoulder slightly*)) whenever we feel like it? Whenever it is convenient for us?!
2	Márcia:	No! No, then ((*moving body, gesticulating with hands*)) ((*Some students stir, and there is talking at the same time. Ernesto is flipping through the handouts.*))
3	Márcia:	just in case of
4	Lucas:	Teacher! For the greater happiness, teacher!
5	Teacher:	Tell us, Lucas. ((*Márcia leans forward, putting elbows on her knees. Some students look at Lucas and are silent.*))
6	Lucas:	In my opinion, I think it is it utilitarianism, because the action is by one person, but it is for a greater happiness, which is for his own good and Clementine's. ((*waves arms wide open, first the left side, then the right side*))
7	Teacher:	For Clementine and for humanity. So is it justified to lie?
8	Lucas:	It is.

9	Teacher:	So every time I feel like it, coming here ((*open hands waving forward*))
10	Márcia:	No, no, Teacher! ((*straightens right arm with open hand pointing toward the teacher.*))
11	Teacher:	And say “today we will have a test” ((*back side of one hand beating the front of the other*)) I'll get you all nervous; I'll put you all in panic.
12	Students	((*overlapping talk among students*))
13	Márcia:	No! This is a matter of life or death! ((*gesticulates and swings body back and forward*))
14	Lucas:	You, you must have some justification!

The teacher's invitation to students to make connections to theoretical concepts on their own reflects an open instructional approach. She also purposefully brought the game into the students' personal spheres by positioning them as protagonists, using first person pronouns to refer to the character in the game as “we” and “us”(line 1). Enacting a familiar, real-life scenario, the teacher-led dialogue shifted the students' position from ‘players’ to people who have an emotional investment in the moral dilemma, thus engaging them in passionate discussion. In fact, when expressing disagreement, students became visibly agitated, raising their voices, gesturing, and flipping papers (lines 2–3). This type of engagement is also characteristic of the discussions in this class. The students attempt to integrate other educational resources that have been provided by the teacher, seeking support for arguments in the handouts. Lucas managed to link the game to curriculum content by analyzing the character's actions in view of utilitarianism, an ethical theory described in the handout (lines 4 and 6). The teacher confirmed this interpretation as relevant, but questioned whether the argument could be extended to the general moral principle “it is justified to lie” (lines 7 and 8), further challenging the reasoning of the students by using her teaching practices as an example (lines 9 and 11).

From a meaning making perspective, the excerpt illustrates how a student masters a new concept by using it correctly in an argument, but also how the teacher's dialogical moves encourage the students to build on and appropriate ideas in ethics by relating them to an everyday social context. As discussion with the teacher playfully veers between conceptual talk and familiar situations, the young people are making ethics concepts ‘their own’ as they make their arguments (line 14).

4.3. Positioning content

Positioning content entails relating domain-specific content to the game narrative to solve problems, to critically analyze the consequences of one's actions conceptually, and to develop a self-understanding as someone capable of solving real problems in this manner (Barab et al., 2012). The previous excerpt exemplified how narratives in games can be positioned as content through teacher-led dialogue, enabling students to understand how concepts and arguments in ethics can be usefully applied in other contexts.

In the game narrative, this time with the Norwegian students, the farmer Hershel allowed Lee and Clementine to spend the night on the farm. The next morning, zombies simultaneously attacked two other characters. One of them was a little boy named Duck and the other one was Shawn, the 20-year-old farmer's son. The game was paused when Lee needed to decide which one of them he would try to save. The teacher turned the game off the screen, put up a PowerPoint about the ethical theory of utilitarianism, and gave a five-minute theoretical explanation, presenting it as “an act that provides the most happiness.” The students were then invited to discuss the dilemma in small groups, using utilitarianism as the starting point for their reasoning instead of the other theories already discussed.

After six minutes of small-group discussion, the teacher stopped the group activity and stood with his tablet at the front of the class to initiate a whole-class discussion, inviting the students to present their conclusions.

Excerpt 2. “Should we save Duck or Shawn?”

1	Teacher:	OK then, I want to hear some arguments for and against. ((*students stir*)) Shhh…! Why save Duck? ((*students slowly stop group work and turn to front*)) Is there some argument for it, or against it, on this matter? ((*Helge raises hand*)) Helge?
2	Helge:	That's the boy, right?
3	Teacher:	Yes.
4	Helge:	((*talks to the teacher who looks at him and says mm-mm at times. Class is silent*)) In pure utilitarianism it is important to rescue the boy. I mean, he has the highest value happiness-wise. So like, if one actually saves the man, one could say that the man would get upset, because the boy was rescued (inaudible) that is, because purely ethically according to all possible norms I think that quite many would agree that this is most right. But at the same time, so you need to look into the situation, and the usefulness of the two persons. But since we are in such an early stage here, it is the boy who is most important to save. If, let's say, it had been ten years on or there had been in many situations like this, then I think the usefulness of the person (inaudible).
5	Teacher:	Yes, good point. Are there others – or someone – who is for saving Shawn? Or against saving Shawn? ((*looks around*)) Sven?
6	Sven:	We are for saving Shawn, so you get the most benefit from staying at his father's farm, and stuff like that, so we're trying to do the best for us to get the best later.
7	Teacher	Yes, good point. Jens, to end.

8	Jens:	But the way I understood it was that he, he got his foot run over, which of course drastically reduces his usefulness.

The teacher applied a closed instructional design throughout, in the way in which the game was played and paused, in the tasks assigned to the small groups, and in the topic of class discussion afterwards. In the excerpt above, he invited the students to focus on one of the choices – to save the boy – and to present arguments either for or against this. Helge defended saving the child because he is the character with a "greater happiness value." His statement (line 4) is very close to the theoretical formulation about utilitarianism presented in the teacher's initial instruction ("an act that gives the most happiness"). His reasoning is quite advanced, as Helge uses theory to evaluate the value of each character, providing examples and concluding that the characters' value depends on the context. The student followed the instructional design by positioning content, a specific ethics concept, as a relevant tool for making game decisions. The teacher positively acknowledged this approach and continued inviting arguments (line 5). Sven, on behalf of his group, pointed to the direct benefits of saving the adult (line 6). At this point, Jens noted that, in the game, the adult character has had an accident that reduces his value to help to fight zombies (line 8). Implicit is the fact that a wounded character will present reduced utility to the group. The excerpt shows that the students' master the concept of utilitarianism, in that they can relate it to the game narrative and their reasoning in problem solving as characters in the game (line 6). The excerpt also illustrates the way in which the teacher's closed approach clearly frames their reflections, as they refer only to this specific concept and examples in the game to make a theoretically based argument.

4.4. Positioning context

Positioning context describes how game environments are designed to contain a dramatic story that works as a situated scenario to contextualize learning (Barab et al., 2012). This context includes interactive mechanisms that enable the game's narrative *structure* to respond to players' actions in *The Walking Dead*™, as well as the *narrative content* of navigating in a zombie apocalypse. In the excerpts below, we analyze the additional positioning work enacted by the teachers' respective instructional and dialogical approaches. Two excerpts are selected, one from each class, in which the students are asked to find a solution to dilemma number five. This dilemma occurs after Lee and his group leave the farm. They meet a woman who has been bitten by zombies. The lady is in a panic about becoming a zombie herself because she sees what is currently happening to her boyfriend who was in the same condition. She suddenly realizes that one person in Lee's group (Carley) has a gun, and desperately, she asks them to give her the gun, implicitly asking them to assist her in committing suicide. The game requires Lee to decide whether to give the woman the gun.

In the Portuguese setting, the teacher divided the class into three groups, and each group was assigned one theory. The task was to discuss possible solutions using the assigned theory and to write one argument for and one argument against giving the woman the gun. Arguments were then to be presented to the whole class. The excerpt is taken from an 11-min small-group discussion among four students who chose to construct their arguments using the theory of *psychological egoism*. The teacher stood by the group. After seven minutes, Isabel had just finished writing down a discussed argument and begun reading it aloud to the working group: "We give her the gun so she can kill herself and her boyfriend so we do not have more to distract us, and we can continue on our way without worrying about whether we will be bitten or not." The conversation among some group members drifted off task before Ernesto returned their attention to the topic:

Excerpt 3. "Should we give the gun to the lady?"

1	Ernesto:	But we're leaving.
2	Isabel:	Yes.
3	Ernesto:	And she stays there.
4	Teacher:	So, we continue our journey.
5	Isabel	Yes, we continue our journey.
6	Ernesto:	What we can say is
7	Teacher:	We get rid of her. ((*Vânia looks up briefly to the teacher and back to Ernesto*))
8	Ernesto:	We continue on our way without remorse. ((*Núria looks to Ernesto*)) ((*students laugh*))
9	Isabel:	Without remorse - that we can't do! ((*pointing pen at Ernesto and laughing*)) You gave her the gun…
10	Vânia	Without… ((*folds a tissue and raising her chin to Ernesto*)) Without looking back!
11	Teacher:	The egoist … the egoist doesn't think of it, right?
12	Vânia:	You just stay there, and off on your way! ((*gesture of shooing forward, with her hand*))
13	Isabel:	((*looking at the written text on paper in her hand*)) We are egoists; we do not think about it!
14	Teacher:	Exactly.
15	Isabel:	Come on now. Second argument ((*resumes writing while Núria looks toward the sheet.*))
16	Vânia:	I'm very egoist today!

The students position context in several ways in this excerpt. First, they assume that the temporal structure of the narrative allows for the consideration of alternative action stages (we will leave, she will stay behind). After the students read the written formulation

and Ernesto began to formulate an argument, the teacher abruptly interrupted him with the provocative declaration, “we get rid of her” (line 7). This break leads to a noticeable shift in the tone of the discussion, drawing the attention of the other students, apparent in their bodily orientations. Ernesto and Vânia picked up on the humorous sarcasm of the teacher's comment and playfully responded in kind (lines 8–10). Second, the students position context through appropriation, by reflecting on their own personal responsibility in alternative decision-making scenarios. Isabel remarked on the fact that a person providing a weapon for someone to commit suicide makes it impossible to avoid remorse (line 9). She used the second person and pointed to Ernesto with a pen while saying this. Positioning of context allowed them to extend their reasoning beyond the game to a real world context in which one's actions have consequence.

Now, the teacher had the students' attention and connected their reasoning to the theory (psychological egoism). Isabel looked down at the text they wrote as the teacher confirmed that they were on the right track (lines 12–14). The teacher's move of bringing theory into the dialogue is simultaneously orienting the students to the main task and to the conceptual domain. She positions the content in a way that contributes to this awareness, and toward a way of playing that is transformational for the students' mastering of the concept psychological egoism. The students showed some mastery of the concept as they picked up the teacher's first person enactments (line 13, “we don't think about it”), and they playfully appropriated the concept in informal speech related to the task at hand (line 16, “I'm very egoist today!”).

In the Norwegian setting, after stopping the game, the teacher called this same dilemma “difficult.” He compared it to the real-life problem of euthanasia. Linking the debate to the issue of euthanasia, the teacher connected theoretical content to broader societal issues, moving across contexts in the same way as the Portuguese teacher. He changed the screen to a PowerPoint and lectured for five minutes about duty ethics, the final ethical theory of the curriculum unit. The excerpt began as he ended his lecture and asked the students to talk together in groups, allowing the use of all the given theories: “Should one loan Carley's weapon to this lady or not? And why, then. Since we have now been through all of the different forms of ethics, you can use all four when discussing.”

Excerpt 4. “Should we give the gun to the lady?”

1	Teacher:	((*approaches the focal group*)): OK. A particularly difficult dilemma. What should one do? ((*Anders smiles at the teacher*.))
2	Ola:	Well. ((*laughs slightly*)) (.) Aahm, well…If you give… we think we should give her the gun and get away from her, or
3	Teacher:	No, no, she will shoot herself in that case
4	Sven:	So we take it back!
5	Ola:	Yes, because if she would just… if you got away from there before she shot herself then technically you haven't seen it happening. ((*swings arm toward table while speaking*))

Approaching the group, the teacher restated the difficulty of the task and posed an open question (line 1) using an indefinite pronoun (“what should one do?” instead of “what should they do”). Ola picked up on this positioning when he responded by using the personal pronoun “you” as he began to make an argument, but shifted to “we,” referring both to the characters and the students (line 2). Similar to the Portugese excerpt above, the teacher interrupted the student and pointed out the consequence of the chosen action (line 3). Sven quickly “takes back” the suggestion, showing how positioning consequentiality is dialogically mutable. Ola's reasoning in line 5 implies that the game context – its narrative structure – allows different scenarios to coexist, as an arena comprising personal unique points of observation as well as a backstage. We see that the teacher invited different opinions with an open instruction approach and used an additional instruction prompt, “And why,” requesting the students to justify their decisions. Verbalizing issues of personal responsibility for actions is a way of dialogically positioning contexts as consequential. Also, the dialogue offers the possibility of “taking back” a possible choice after reasoning about its consequences. This shows how positioning of the context is achieved, with consequentiality dialogically flexible. This excerpt illustrates students positioning contexts to adjust their dialogic reflections—in this case, the need to avoid facing responsibility for their actions.

The teacher followed up the issue of responsibility in relation to the consequences of the game context. He compared the present situation to the previous dilemma (Excerpt 2), Shawn vs. Duck: “To what extent was Lee responsible for Shawn's fate, is it Lee's fault that Shawn died? (…) Is it Lee's fault now if he loans the gun to this lady, is it his fault that she dies? Is there a difference?” The students recognized a difference because in the first dilemma, Lee actually “did not put Shawn in the position that something could happen to him.” Comparing the two dilemmas shows a dialogical approach in which positioning content is made possible by positioning context. In other words, the teacher draws on alternative narrative structures in the game (line 3) to prompt the students to reflect on whether there are conditions under which they might not have to deal with the problem of duty. The dialogue is used to discuss agency, consequentiality, and responsibility in a meta-reflective way. The main character is described as capable of providing means *for a particular consequence* but, more, for being *responsible or not* for *putting* someone in a certain situation. Both consequences and moral implications of the character's actions (such as “fault”) were discussed. This is a good example of how dialogue contributes to positioning context consequentially, resembling transformational play.

5. Discussion

In the presented excerpts, we analyzed the kind of positioning work – key to transformational play (Barab, Gresalfi, and Ingram-

Goble, 2010; Barab, Sadler, et al., 2010) – that was accomplished through the teachers' different instructional and dialogical approaches to GBL. In terms of *positioning person*, we found that teachers and students frequently assumed the role of protagonist and used the first person to refer to characters in the game ("But we are leaving," Excerpt 1). We see the blurred distinction between players and characters ("*we* think *we* should give her the gun" Excerpt 4) in the teachers' and the students' talk, which is quite common when people talk about videogames (Klimmt, Hefner, & Vorderer, 2009). The agentive positioning engendered the use of both hypothetical and real-life experiences in the discussions. Role-playing was facilitated by the game's interactive potential, which allowed the player to choose actions and dialogue from programmed options. We found that the teachers' dialogical approaches played a central role in positioning students as 'change agents,' meaning that the students often displayed a sense of agency and ownership in the decisions they made, in their appropriation of the characters' dilemmas and in the solutions to these dilemmas (Wertsch, 1998). Positioning persons with intentionality ("So we lie whenever we feel like it?" Excerpt 1) was accomplished through linking game dilemmas to real-life experiences. This allowed the students to engage in personal narratives that brought emotional resonance, linking learning with identity processes (Baranowski et al., 2008), and allowing students to appropriate elements of the narrative as their own through role-playing (Ryan et al., 2006). Such teacher-led talk, in both whole-class and small-group settings ("Have you ever been confronted with this situation?"), created an informal dialogical space that fostered spontaneity and student-student interactions.

Positioning person was closely linked with *positioning content*: inviting the students to use concepts from ethical theories to reason and make decisions positioned the students as informed and reflective protagonists. Examples come from both cases: in Excerpt 1 in the Portugal case, Lucas refers to the act of Lee lying to the farmer in dilemma 1 as: "In my case, I think it is utilitarianism". Or in the Norwegian case, in dilemma 2, arguments for saving Duck over Shawn: "In pure utilitarianism it is important to rescue the boy." Using different instructions, the two teachers mediated the students' meaning making by relating their use of ethics concepts and theories to the situated gameplay experience. They wove contributions into coherent wholes (Alexander, 2006) and helped the students fill gaps between the confronted perspectives and an infinite number of possible new perspectives and insights (Bakhtin, 1981). Our analysis described how concepts became introduced and developed temporally through dialogue, as utterances were picked up and expanded on in an inter-animated, shared construction of meaning (Wegerif, 2011). Interchanging different instructional patterns led to a range of non-determined possible answers that were treated not as endpoints, but instead as generators of further questioning (Enqvist-Jensen et al., 2017; Mercer, 2008).

The notion of *positioning context* was also expanded through game-related dialogues. An example of how virtual contexts are positioned with consequentiality through the dialogue itself is Lucas regretting the decision debated by his Portuguese colleagues regarding saving the adult instead of the child: "So now you will save the child, you will all die!". Lucas anticipates the consequences of the discussion. The idea that the game's dramatic story follows a responsive consequential system depending on the player's actions is intrinsic to the notion of transformational play. A good example is also when the student says "So we take it back" in Excerpt 4. Existential issues are also dialogically positioned in relation to the game context: (if you get away from there before she shot herself then technically you haven't seen it happening). This implies that the game follows a course of its own, even without the characters' presence. The same co-existence of different scenarios within the game is expressed in Excerpt 3, when Ernesto says "But we're leaving (…) and she stays there." Discussions in the two classes often predicted future game scenarios as though dependent on the choices made from their argumentation of ethical theories. Students engaged in passionate attempts to convince their peers to make certain choices, including personalizing examples and bringing in examples from real-life contexts, such as when the teacher referred to the hypothetical situation of a surprise test.

Finally, we noted variation in the way the videogame was integrated with other resources. In the Norwegian case, the extensive use of technological devices and platforms provided a sense of a tight or closed instructional structure and an accelerated class pace. The teacher integrated digital and non-digital traditional educational resources, such as printed handouts and PowerPoints, in the dilemmas of the game narrative. In the Portuguese case, the use of technology was limited to gameplay, and the teacher organized more time for more open and longer class discussions. However, although the two approaches created differences, they did not seem to have a direct effect on the interactional accomplishment of TP. This finding resonates with the idea that resources may be organized to exploit the pedagogical and interactional affordances of the videogame (Beauchamp & Kennewell, 2010), aligned in a manner that preserves both the situated nature of the classroom and the fantasy aspects of the game narrative (Van Eck, 2009).

6. Conclusion

The similarities and differences in the two cases demonstrate what was vital for transformational play to occur. First, we found that several routes may be taken to accomplish the learning aims of transformational play. Teachers are different and so are classroom contexts both within and across countries. Both of the teachers integrated instruction, technology, and dialogue in gameplay activities, including theoretical explanations, class and group discussions, and voting. But the trajectories diverged in the two cases – one started by presenting theory 'up front' in the early lessons and using an open dialogical approach throughout, while the other incorporated concepts into tightly orchestrated dialogical spaces over time. Resources to support students in learning theoretical concepts included PowerPoints and printed handouts, and these were actively used and referred to during discussion activities in relation to the game narrative (Van Eck, 2009). Despite differences in instructional approaches, both facilitated students' understanding of ethical theories, suggesting that there are many ways for teachers to design GBL. In both cases, the teacher's dialogical approach was key to mediating relations between the theoretical content and game narrative, opening dialogic spaces for multiple perspectives and collaborative meaning making, and linking game dilemmas to identity issues and personal learning experiences (Silseth, 2012). Using questioning and justification more than aiming for correct answers was a common dialogical feature (Barab,

Gresalfi, and Ingram-Goble, 2010; Barab, Sadler, et al., 2010). We conclude that the potential of the commercial videogame as an educational resource was extended through teachers' instructional designs and dialogical approaches. Discussion and teacher interventions led to deeper and active learning through collaborative meaning making (Mercer, 2008), namely by discussions that prompted students to verbalize and connect knowledge (Wouters et al., 2013)

Second, our analysis shows how different instructional and dialogical approaches allowed the teachers to accomplish positioning work, which is key to learning in transformational play. We verified that the use of instruction helped students to position person, content, and context as a useful resource for critical reasoning about ethical theories. We identified three types of positioning work that was dialogically accomplished in alignment with the videogame's affordances: (a) dialogues positioning the students as decision makers and investing them with authority and agency; (b) dialogues positioning the disciplinary content as a relevant resource for addressing ethical problems; and (c) dialogues positioning context in ways to reason about possible consequences that could be acknowledged and evaluated in productive ways. We conclude that the positioning work, accomplished with the teachers' different instructional and dialogical approaches to game-based learning, was key to transformational play. Also relevant is Gee's (2003) point that videogames invite learners to relate to, navigate and reflect on different roles and identities, which in this case was far from the students' every day. The gameplay nevertheless seemed to bridge the students' real experiences and the presented theories and supported them in reasoning about moral and ethical issues through the narrative structure and content of the game, but more importantly through the teachers' organization and enacted learning design. The findings have implications for the design of learning situations that integrate new technologies with more traditional approaches, and are in line with accumulating evidence of the value of discussion and how teachers should facilitate students learning with technology. Principles for productive learning, such as TP, may support students' learning when programmed into serious games (Barab et al., 2012), but our study suggests that learning is also facilitated when teachers' enacted designs for game-based learning follow these principles. Teachers plan a learning environment with educational resources and instructional designs, but may be unsure about the use and assessment of new resources such as videogames. We propose that TP can function as a framework and a guide for planning and evaluating lessons with videogames. This study shows that commercial games may function as a productive resource for learning in formal education, and can create opportunities to engage students in learning experiences that bridge in-school and out-of-school practices. Further studies may extend these findings to other videogames and learning designs, to investigate issues related to transfer and possible applications in other disciplinary domains.

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Productive Disciplinary Engagement and Videogames

A Teacher's Educational Design to Engage Students with Ethical Theories in Citizenship Education

Filipa de Sousa
Research Fellow, Department of Education, University of Oslo, Norway
f.d.sousa@iped.uio.no

Ingvill Rasmussen
Professor, Department of Education, University of Oslo, Norway
ingvill.rasmussen@iped.uio.no

Abstract

Interactive learning environments such as videogames may facilitate learning through engagement. However, not all kinds of engagement are relevant to learning in formal education; much depends on the use of pedagogical approaches and videogames in the classroom. This study investigates a curricular unit in an upper secondary class using the commercial videogame *The Walking Dead* to teach ethical theories in a citizenship course. We focus on how the teacher's design of the lesson facilitated students' disciplinary engagement and find that productive disciplinary engagement (PDE) principles, together with dialogic interactions, extended students' engagement beyond gameplay and helped them understand the meaning of the theoretical content. Based on our findings, we propose a set of recommendations concerning educational design for teaching and learning with commercial videogames.

Keywords

Productive disciplinary engagement, game-based learning, educational design, learning trajectories, teacher's role

Introduction

'At the heart of teaching well is the core challenge of getting learners engaged in productive work' (Ball (2000, p. ix), as cited in Engle & Conant, 2002, p. 400). This quote, which concerns the design of productive disciplinary engagement (PDE), emphasises the importance of students' active engagement and meaning-making processes in disciplinary work (Kumpulainen, 2014). Educational designs that incorporate students' knowledge and interests outside of school can facilitate engagement (Bransford, Brown, & Cocking, 2000; Polman, 2006). Videogames are important in many people's lives outside school, and thus game-based learning (GBL) offers innovative, engaging designs that might facilitate engagement also in formal education (Hanghøj, 2013). However, empirical studies about whether videogames facilitate learning have had varying results (Abdul Jabbar & Felicia, 2015; Huizenga, Admiraal, Akkerman, & Ten Dam, 2009). Using videogames in classrooms does not guarantee engagement (Squire, 2005), and engagement in games does not guarantee learning

outcomes (Arnseth, 2006; Linderoth, 2012; Young et al., 2012). It is challenging to design and enact GBL that fosters engagement with conceptual knowledge, productive work and learning (Hanghøj, 2013), and this challenge cannot be solved by games alone.

This article focuses on the educational design of GBL and how students respond to such design, including both the game and the related disciplinary work. In this context, there are two aspects of educational design: design for teaching and design for learning (Hauge, Lund, & Vestøl, 2007; Lund & Hauge, 2011). *Design for teaching* refers to the teachers interpretation of a curriculum and the planning of activities, influenced by pedagogy, experience and the local school culture. *Design for learning* refers to the teacher's enacted design, which is context-sensitive and enables serendipitous events to occur. The latter results from the interaction between students and teaching and involves social and cultural experiences in non-school contexts. According to this view, design includes both the content and form of teaching. In addition, learning refers not only to patterns of teaching but also to how one creates meaning for knowledge through interactional means over time (Hauge, Lund, & Vestøl, 2007).

We followed a class of students in a vocational upper secondary programme in Portugal in which the teacher used the videogame *The Walking Dead* (Telltale Games, 2012) to teach ethical theories. The design of such new learning activities strategically aims to prevent school dropout during the Portuguese economic crisis. In the GBL activity, students collaboratively played the game, and the teacher paused the game to lead discussions about moral dilemmas in the game narrative in relation to ethical theories the students had learned previously. In the field of citizenship education (CE), disciplinary learning involves not only acquiring theoretical civic knowledge but also understanding the values of a democratic society and gaining the ability to reason critically (Advisory Group on Citizenship, 1998). Here, we understand learning theoretical civic knowledge to involve mastering and appropriating both theoretical knowledge and civic skills, i.e. combining theoretical knowledge and applied discourse practices within a discipline. In this study, we aim to understand how the features of an educational design relate to students' PDE and what constitutes this relationship. We do so by addressing the following research questions:

- What characterised the teacher's educational design, and how did it foster students' engagement beyond the game?
- How did the students engage in meaning-making regarding the ethical theories during the curriculum unit?

Educational design for productive disciplinary engagement

We focus on GBL principles that facilitate productive engagement for learning ethical theories. Specifically, we use a sociocultural and dialogical approach (Wegerif, 2007) to understand how mediational means, such as technology, discourse and other learning resources, were used to engage the students in the unit (Rasmussen & Damsa, 2015). We study the processes by which social interactions and class dialogues interweave with technological tools as mediational means (Rasmussen, 2012), and we follow the trajectory of discussions and class activities to analyse how participants construct knowledge from GBL activities.

Learning environments affect emotional and cognitive engagement, including students' behaviour, speech and interactions (Bundick, Quaglia, Corso, & Haywood, 2014; Fredricks, Blumenfeld, & Paris, 2004). But not all kinds of engagement are productive for disciplinary work (Kumpulainen, 2014), and some types of discussion are more productive for learning than others (Howe & Abedin, 2013; Mercer & Dawes, 2008; Michaels, O'Connor, &

Resnick, 2008). Alexander (2008) argued that classroom dialogues should be collective, reciprocal, supportive, cumulative and purposeful, which are central dialogical principles. Furthermore, other authors have claimed that different forms of engagement lead to different ways of appropriating and mastering knowledge. This applies to digital learning environments, such as games (Gresalfi & Barab, 2011), and classrooms (Engle & Conant, 2002). Wertsch (1998) defined mastery of a cultural tool as knowing how to use it, while appropriation implies that one makes the cultural tool one's own.

There are different levels of engagement. Simple *procedural* forms of engagement may cause students to act without exactly understanding why, and *conceptual* forms of engagement lead students to apply disciplinary concepts to some extent, but only *consequential* forms of engagement allow those concepts to be perceived as disciplinary tools that can be used to accomplish goals that are meaningful in the world. *Critical* engagement implies reflection on this application of tools (Gresalfi & Barab, 2011). In GBL, progression towards critical engagement is argued to promote attitudes that allow students to succeed in the real world (Barab, 2016).

Engle and Conant (2002) describe indicators of engagement in students' discourse, including (a) making substantive contributions to the topic under discussion; (b) contributing in coordination with each other rather than independently; (c) paying attention to each other and aligning their gazes and body positioning; (d) participating in few off-task activities; (e) expressing passionate involvement through emotional displays; and (f) remaining interested in the topic over a long period of time. The authors' study of a controversial discussion among 5th graders revealed that the controversy helped the students gradually create more complex arguments leading to a deeper understating of the curriculum topic. They conclude that the educational design was central to the students' engagement and their journey to becoming disciplinarily productive. The authors used the term *disciplinary* to refer to 'contact between what students are doing and the issues and practices of a discipline's discourse' (Engle & Conant, 2002, p. 402). The present study uses the term in the same way. Engle and Conant (2002) also identified four guiding principles for teachers promoting PDE:

1. Encourage students to *problemati se topics* instead of vertically assimilating teachers' explanations.
2. Give students *authorship* of their own contributions and promote their intellectual agency to collaboratively solve problems.
3. Ask students to *account for* disciplinary standards and others' ideas while elaborating upon their own arguments and justifying their own positions.
4. Provide students with adequate *resources* for this work, including access to relevant information, enough time and support.

Part of the teacher's responsibility is to manage tensions while maintaining a balance between the four guidelines over time. A balanced *authority – accountability axis* encourages students to offer ideas and request elaborations. A balanced *problemati sing – resources axis* leads students to perceive the situation as challenging but avoid unproductive frustration (Engle & Conant, 2002).

Following this seminal work, several studies have portrayed the moment-by-moment and long-time composition of learning trajectories in different school subjects (e.g. Furberg & Ludvigsen, 2008; Krange, 2007; Ludvigsen, Rasmussen, Krange, Moen, & Middleton, 2011; Twiner, Littleton, Coffin, & Whitelock, 2014). Our study uses PDE to analyse how the

teacher's design extended engagement from the videogame to theoretical content about ethics. The notion of trajectories is employed to describe the learning process and explain how it unfolds through a meaning-making process that results in different degrees of mastery and appropriation (Rasmussen, 2012; Rasmussen & Damsa, 2015; Thompson, 2015). Other studies that followed a similar approach have shown how teachers' enacted designs are central to PDE within technology-rich learning environments. For example, Krange (2008) followed a group of science education students' interaction with a computerised 3D DNA model and described the students' need for the teacher's support to apply meaning to the theoretical knowledge in the digital representation. Also, the newest edition of *How People Learn* discussed the importance of the design of learning environments, arguing that new technologies have the potential to enhance learning but that there is a need to consider students' background knowledge, interests and cultural stances, and that new technology/knowledge resources and assessments should be designed to facilitate understanding, not only memorisation (National Academies of Sciences, Engineering, and Medicine, 2018).

Even though research on games has documented their ability to motivate (Dickey, 2011), translating a gaming experience into a learning experience is not straightforward. Research has demonstrated that even technologies designed with the intention of teaching specific content are actualised as learning resources only in interactions (Furberg & Rasmussen, 2012). Teachers are especially important when a tool is not intended to educate, such as in the case of commercial videogames (e.g. Egenfeldt-Nielsen, 2006). Commercial games require teachers to assume the responsibilities of designers, managers and facilitators (Van Eck, 2009). These games can be used (1) prior to studying new material as an orientation activity intended to establish relevance, context and interest; (2) while studying new material as a means of practicing and providing feedback or assessing prior knowledge; or, in the ideal case, (3) both prior to and while studying material. In the latter case, game activities serve 'as an anchoring environment that encapsulates the full learning cycle' (Van Eck, 2009, p. 14).

Multiple studies provide reasons to acknowledge the importance of the contextual aspects of engagement (Fredricks, Blumenfeld, & Paris, 2004; Lawson & Lawson, 2013) when studying principles of the educational design of GBL that might be productive for learning. We thus acknowledge this when we analyse the interactional aspects of the teacher-enacted design and students' engagement over time to understand how they relate to meaning-making regarding curricular content.

Method

Context of the study

The participant school, which offers vocational programmes to high school students, is located in Portugal. The students at the school are mainly of low socio-economic status, some had dropped out of schools for some time, others had other challenges. Hence the students age ranged between 18 and 22 years. The teacher was recruited through the researcher's professional contacts and was interested in GBL as an opportunity to engage students and combat motivational problems. The teacher chose the class that would participate in the study. The class was composed of 14 students. Neither the teacher nor the students had previous experience with GBL, but the students reacted to the idea with visible enthusiasm. All participants voluntarily gave informed consent to participate in the activities and the study. Their identities will remain anonymous.

The teacher was inspired to design the activity by a Norwegian teacher (Staaby, 2015), about whom she learned through conversations and co-designing with the observing

researcher. The game used in this study is the first episode of *The Walking Dead*, a commercial role-playing adventure videogame. In the game, an escaped murderer named Lee makes difficult decisions to protect himself and a little girl, Clementine, during a zombie apocalypse. The game is more story-driven than action-packed and features an open narrative that unfolds based on the player's decisions, which affect dialogue and the actions performed by the characters. The game's design focuses on narrative and character development, and the emotional, empathic tone of its narrative has been noted (Madigan, 2012). Many decisions involve moral dilemmas, such as whether Lee should give a gun to someone who wants to commit suicide before becoming a zombie. Thus, the game is an interesting way to teach ethics. Figure 1 illustrates the character representation and dialogue interface in *The Walking Dead* game; the player can choose between several dialogue options that reveal or conceal Lee's past to varying degrees.

Fig. 1 Screen shot from The Walking Dead

The class was followed as they learned a subject called *Área de Integração* (Integrational Area). A part of some vocational programmes in Portugal, this subject focuses on social conscience and citizenship as well as philosophical, social and ethical concepts. We followed a unit of the curriculum that was taught in seven lessons over one month. The teacher presented the curricular content and then allowed students to play the game. The game was in English but subtitled in Portuguese, projected onto a screen, and students took turns controlling it. The students played the game´s first episode from its beginning an all through the game action, until the presentation of the first five dilemmas posed by the game. Despite the time countdown given by the game for the players to make choices, the teacher interrupted the countdown by pausing the game at each of the five moral dilemmas. As those moments, the teacher led discussions using the theoretical content about ethics presented in the lessons. After each discussion, the students voted on what decision to make in the game. The activity ended with a post-reflective plenary discussion. A graphical representation of the activity flow is presented in Fig. 2

Data collection and analytical work

We consider the video-recorded classroom interactions (487 minutes, one fixed camera) to be the main data. Field notes supplemented the main data to enable better understanding of the context.

Studies addressing the sequentiality of the learning process (Mercer, 2008; Rasmussen, 2012) emphasise the ways learners interact, not only in a given situation but also across situations. The analytical solution we describe involves two levels of analysis, to distinguish the infinite interconnections within the data:

- At the *trajectory level*, we considered the learning process as a whole and analysed the students' progress within the temporal boundary of the unit. Contextual aspects central to engagement were used to characterise not only moments of PDE (interactional level) but also determine characteristics over time (trajectory level).
- At the *interactional level*, we investigated the moment-to-moment social construction of engagement in relation to the design of the GBL environment. This level helps us to understand how meanings are created through the teacher and students' interactions with the available resources.

The two levels of analysis inform each other and, taken together, provide insights into not only how certain activities or knowledge become relevant at a point in time but also how and why they stay relevant throughout an activity.

At the trajectory level, we characterised the teacher's enacted design and sequenced the classroom GBL activities. Using methods inspired by thematic analysis (Braun & Clarke, 2006) we identified patterns within the whole dataset. Through this inductive process, we described how the trajectory of GBL unfolded over time. Over multiple viewings of the videos, we performed substantive categorisation (Maxwell & Chmiel, 2014), meaning that we inductively generated descriptive categories of the data. We identified the main parts of how the teacher organised class activities, particularly how gameplay was integrated with other activities and resources. Then, we focused on each of these parts, analysing the way meaning was created through dialogue at the interactional level. This involved analysis of the data to identify the dialogic aspects that characterised disciplinary engagement using micro-analytic approaches inspired by Jordan and Henderson (1995). We also sequentially analysed utterances as 'turns' to describe how the inter-animation of different voices (Bakhtin, 1981) allowed meaning to emerge and develop while students engaged in meaning-making about the ethical theories presented in the unit.

The excerpts in the results section were selected for their relation to our research questions and to illustrate the central findings of prior literature about what characterises engagement and PDE (Engle & Conant, 2002; Fredricks et al., 2004; Gresalfi & Barab, 2011; Lawson & Lawson, 2013). These excerpts were transcribed in Portuguese and then translated into English using a simplified Jeffersonian transcription system (Jefferson, 1984). The transcriptions include all verbal and non-verbal elements that aid analysis of engagement indicators (see Appendix A for transcription conventions).

Analysis

The GBL trajectory

We start by analysing the educational GBL design at the trajectory level and how activities were sequenced. Figures 2 presents a visual representation of the classroom activities, where we identify 4 parts along the activity proposed by the teacher.

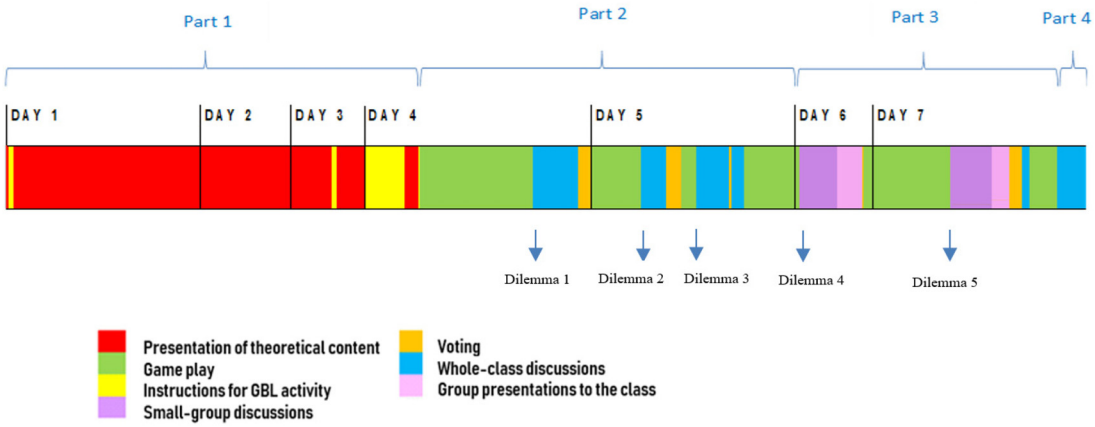

Fig. 2 Visual representation of classroom activities over time
*Officially the lessons were of 45 minutes or of 90 minutes; however, they hardly started on time, so GBL activities in the seven followed lessons lasted respectively 77, 36, 29, 90, 81, 31, and 84 minutes.

Part 1: Introduction of theoretical content and GBL activities

Part 1 mostly consisted of presentations of the theoretical content (shown in red in Fig. 2). The teacher created a four-page handout, adapting the level of difficulty of the concept to the class profile, and addressed the content by combining dialogue with reading activities. The handout presented three ethical theories, which are summarised in Table 1.

Table 1 The three ethical theories presented in the handouts

Kant's deontology	Moral action is a duty guided by universal goodwill towards others. The moral value of an action depends on its intention, not on its results. Examples include 'always protect the weaker' and 'never steal or lie', regardless of one's motives.
Utilitarianism	An action should be chosen based on its consequences, which should be useful to the greatest number of people and best contribute to the happiness of society.
Psychological egoism	Acting according to personal benefit is part of human nature; serving one's own interests is a moral imperative. The main opponent of this theory is Kant's implicit altruism.

The teacher orally presented the content to students. She made connections to students' previous knowledge, posed questions and asked for examples. Students participated orally when required and followed the handouts. Small talk and parallel conversations were quite frequent. Since the school bell was broken, students were eager to note when class time was over.

Part 2: Game play and whole-class open discussions

In Part 2, the class played the game (green) and, when the game was paused, discussed the first three dilemmas it presented with the whole class (blue). The discussions started with simple invitations for students to freely express their opinions about the dilemmas. They were long and included passionate argumentation among students.

Part 3: Game play, structured small-group work and class presentations

The class played the game and discussed the last two dilemmas in organised groups (magenta). Each group (3–4 students) was assigned one theory to employ in relation to the game dilemma and later report to the class (pink). The teacher reminded them to use the handouts. During the group work, the students talked and read from the handouts.

Decisions regarding the 5 dilemmas in parts 2 and 3 were made through a voting process (orange). For each dilemma, the game presented two possible actions, but three options were presented for the students through the digital app Kahoot[1]. These options were created by the teacher to reflect the ethical theories. Each student used a computer to vote, and the option with the most votes led to an action that was then enacted in the game.

Part 4: Whole-class evaluation of the GBL activities

The unit ended with a post-reflection led by the teacher concerning how the GBL activities helped the students learn the curricular content and relate it to real-life contexts.

Results

Teacher's design and students' engagement

In this section, we describe the students' response to the teacher's design over time at the interactional level. The teacher combined collective gameplay with whole-class and small-group discussions that were structured and facilitated in different ways. Before starting gameplay the teacher said to the class that: "We have three theories that I would like you to (…) apply; we will then make the practical dimension of these theories because in the videogame that we will analyze here (…) we will have to commit ourselves; we will have to make decisions. We will make decisions; we will opt among paths within the game, according to moral-ethical theories".

While playing the game we observed attentive expressions and vivid emotional reactions among students. The participatory nature of the experience was evident in students' use of the first person when speaking. For example, we observe that students commented on the game dialogue by saying 'I want to be honest here'. During Part 2, students engaged in long, passionate discussions about the three first dilemmas (respectively 17, 12 and 11 minutes). They defended their views with visible conviction, constantly overlapped each other and asked each other to talk. The quieter students followed these debates with attentive expressions. Parallel activities or requests by the teacher to stay on task were almost non-existent. In contrast to Part 1, the students did not want to finish the class; they asked to stay over the breaks and tried to be dismissed from their next class to continue their discussions and gameplay. We also observed that the teacher often asked students to justify their positions by posing 'why' questions and prompting them to make connections to the theoretical content.

We selected excerpts from Parts 2, 3 and 4 to illustrate how the educational design relates to students' PDE. Table 3 presents an excerpt from Part 2 that was observed after 45 minutes of gameplay. In the game, Lee and Clementine arrive at a farm and seek shelter. The first dilemma is whether Lee, a runaway criminal, should tell the truth about his background—which could be risky because he was a criminal—or lie.

1. https://kahoot.it

Table 3 Excerpt from Part 2

1	Teacher:	Let's try to understand, what do you think it is happening here? Should he tell the truth? (.) should he lie ... ?
2	Carolina:	(.) He must tell the truth, teacher.
3	Marcia:	On the one hand, yes; on the other hand, no.
4	Teacher:	Why? On the one hand, why?
	7 turns:	Students discuss how the character would be sent out if admitting to be a criminal.
5	Marcia:	On the one hand it is bad to lie, but when it comes to (.) for our own good… ((*smiles, looking around and Carolina looks back to her and laughs*))
6	Teacher:	Oh, so if it is for (.) We in an egoistic [attitude...? =
7	Isabel:	[No, because it is to help the girl as well.
8	Teacher:	= Only thinking of !- (.) So, there is no egoistic perspective, here.
9	Ernesto:	[Yes, there is, yes there is!]
10	Isabel:	[No, there is not ! It is] for him and for the girl!
11	Teacher	(.) Because he is [asking help for him and] for Clementine.
12	Marcia	[Thinking also on the girl]
13	Teacher	So, there is no egoism (.) there is…? what?
14	Isabel:	There is (.) ((*looks briefly towards the handout lying on the table*)) Kant.
15	Luana	Al-truis ... Ihhh, I can´t [say this word! ((*Ernesto pick the handouts*))
16	Teacher:	[No, not altruism! [Is he ? =
17	Isabel:	((*look through handouts*) [It is the theory from !-
18	Teacher:	= Is he acting with no interest? [No. He is...
19	Marcia:	[No, he is acting with interest
20	Isabel:	[It's the theory from Kant !
21	Teacher:	Kant? No… You think that? ((*Stir*)) Then in Kant ?shall we lie or tell the truth? ((*Joaquina and Carolina pull handouts toward themselves*))
22	Luana:	Tell the truth. ((*Ernesto reads from the handouts*))

This excerpt illustrates how the teacher engaged the students in connecting the game narrative and theory. The class discussion is opened with a binary choice (lines 1–3), and the students appropriated the narrative by using first-person pronouns (e.g. 'our' in line 3). The teacher tried to connect the narrative to theory (line 6) and asked the students to make theoretical links (line 13). The students' utterances were partly overlapping, and some of the students turned to the handouts. However, in this part, rapid glances at the sheets did not provide the necessary insight. The teacher posed new questions based on the students' wrong answers (lines 16, 18 and 21). The conversation lasted for about one more minute before Lucas, who was attentively following the discussion, presented a valid theoretical connection: 'I think that it is utilitarianism, because his action is individual but it is for a greater happiness, meaning for his own good and the girl's'.

We raise the issue of time to show that making connections between the game narrative and the theoretical content of the unit was not straightforward, even when the students seemed to listen actively and participate in the discussion. The collaborative reasoning shown in the excerpt helped Lucas provide a valid answer by building on others' contributions. As such, we argue that the dialogue was disciplinarily productive and showed how engagement with the game led students to tentatively use different ethical theories (Wertsch, 1998).

Even though the students were held accountable and were given the necessary resources, appropriation of the theories were not frequent in this part. However, conflicting views were common. The unstructured form of the class debates sometimes caused tentative theoretical elaborations to disappear. Nevertheless, the teacher maintained a balance between problematising and accountability (Engle & Conant, 2002), sustaining students' interest by allowing them to engage in long, personal arguments and then bringing the conversation back to the theoretical concepts.

In Part 3, students' discussions included more explicit references to the theoretical framework. The discussion and presentation activities about the two last dilemmas lasted 25 and 23 minutes, respectively. The students paid more attention to each other's arguments, questioning and elaborating upon each other's ideas. The group members also silently read the handouts to form arguments. The teacher maintained physical proximity to the groups and occasionally intervened to help the students make theoretical connections more explicit. The next excerpt, from the sixth lesson, is taken from a small-group discussion in Part 3. In the game, Lee and his group must decide whether to risk their lives to rescue a human they do not know who is surrounded by zombies.

The focal group was asked to defend utilitarianism. According to the handouts, this theory 'valuates actions for their results', which ideally involve 'bringing happiness to a larger number of people' based on the idea of 'promoting greater social happiness'. It opposes Kant´s deontology. According to the handouts, 'Kant's ethics is deontological since the moral value of an action does not depend on its consequences, but on the respect for the duty (…) what counts is intention, the motive, not the result'. The students were tasked with writing two arguments, both adopting a utilitarianism perspective, to justify saving the woman and not saving her. We enter the excerpt in Table 4 at the moment the three students start their discussion, after about one minute of silently reading the handouts.

The students collaboratively engaged in meaning-making during the task in the form of interrogations (line 3), reflexive silences (lines 6 and 10) and reading from the handouts (lines 6, 9 and 10 and immediately before the excerpt). Long silences, which were followed by relevant contributions, indicate reflection. The excerpt shows the students reasoning collaboratively, using the theoretical handouts to jointly interpret the situation, make meaning and gradually distinguishing between different theoretical perspectives on the game's narrative (lines 11 and 13).

After the group work, the teacher began to lead the presentations, telling students to adopt a particular theoretical stance: 'You are utilitarians (…) [consider] what a utilitarian should do; should he help or not (…) what matters to you?' While the group presented, the teacher used 'why' questions to encourage them to justify their claims. When a student from another group posed a doubt, the focal group found it difficult to clarify the reasons behind its position. Thus, even though they developed arguments that aligned with the theories, the students could not clearly verbalise their reasoning to the class. Achievement of success in their analytical work, and thus mastery, were hindered by the students' difficulty appropriating the theory practically and conceptually justifying their arguments. This led

the teacher to intervene, formalising the answer to the class in more conceptual terms. A second round of the task with similar intentions took place in the next lesson. The teacher ensured that each student was assigned a theoretical perspective that was different from the one that he/she had defended the first time.

Table 4 Excerpt from Part 3

1	Ernesto:	So this is the one we chose, right? –U-Ut-utilitarianism ((*locates that part of the text on the handout and opens it on the table*)). Two arguments. We must help the women because it is (.) our duty to give happiness to the society.
2	Manuel:	But to us, in this case, to the group, right?
	(5 turns)	(8.0)
3	Iuri:	Because it is our duty to help the weaker?
4	Ernesto:	Because... ((*writes*))
5	Manuel:	In this case, the opposite sex.
6		((Ernesto writes and Iuri assumes a wondering face. Looks briefly to writing and the handouts for 10 seconds))
7	Iuri:	I am not sure if it is (.) Kant who says that or...
8	Ernesto:	((*pointing to the handout with the pen*)) No. Kant is here, ethics [is here.]
9	Iuri:	[Yes, but] I think that it is Kant that says that thing about the weak. ((*reads the handout, as does Ernesto*)) (11.0) Where does it say that?
10		The students analyse the text. Ernesto dedicates 40 seconds to this, and the others quit after 10 seconds, distracted by another group.
11	Ernesto:	Ah, I've got it! Here is the duty. ((*points to the upper part of the handout, where it describes Kant's deontological theory*))
12	Iuri:	Hm. ((*all students look to the handouts*))
13	Ernesto:	Here is more for the result. ((*points to the part of the handout where utilitarianism theory is described*))
14	Iuri:	Hum-hum
15	Manuel:	Hum-hum. Yes. ((*Ernesto starts writing again*))

The discussion in Part 4 was opened by the teacher with an invitation to evaluate the activity: 'What have we learned here, even [though it is] a story, a fiction in a game?' One student claimed, 'the game has served as a way to help us take on more difficult decisions in the future'. Another student added to this, referencing psychological egoism theory and the choice 'to be an egoist or not'. These quotes illustrate how the students perceived the game as an educational resource, that is, how they connected the game to disciplinary forms of discourse and their relevance to real life. The excerpt in Table 5 shows how the unit ended.

Table 5 Excerpt from Part 4

1	Iuri	It is a pity that the game ends today!
2	Isabel	The issue is that the game doesn't end just today, it has continuation!
3	Teacher	You will continue the game, right?
4	Iuri	In the class? ((*students laugh*))
5	Teacher	You will continue playing along your lives =
6	Vania	Yes, that's right.
7	Teacher	= and also this particular game, when you feel like it because now the technical means are available
8	Ernesto	They are teaching us that life is a game.

Part 4 involved reflection about whether the game offered a learning experience that was relevant to real life (lines 2 and 5). In line 8, Ernesto referred to the videogame as a learning resource. We argue that what Ernesto perceived as an intentional method of education in the game design was, in fact, created by the educational design. Some students considered games to be safe places in which mistakes can be fixed. Others argued that life also provides multiple learning opportunities. This idea was supported by the teacher, who ended the unit by saying that learning goes beyond school: 'We keep on learning, right?'

Discussion of findings

The distinction between *design for teaching* and *design for learning* (Hauge, Lund, & Vestøl, 2007) is helpful for discussing how the educational design fostered students' engagement beyond the game and meaning-making concerning ethical theories.

Our study demonstrates that teachers are also designers of classroom activities and resources (Hauge, Lund, & Vestøl, 2007; Kress et al., 2005; Lund & Hauge, 2011). The planned tasks, handouts and organisation of activities constitute central aspects of *design for teaching*, confirming the importance of designing GBL environments that mix games with other learning tools and materials (Abdul Jabbar & Felicia, 2016). The game and the teacher's self-developed resources (lectures and handouts) were emphasised and served as structured resources for the students. Resources were made available to achieve the teacher's educational goals, which were clearly not the same as the goals of the game, a commercial product.

We found that the teacher's design, which aimed to encourage students to connect the game and theory took time to be realized. In Part 2, the teacher allowed the students to be emotionally engaged with the game's narrative and use their previous knowledge as a resource to make meaning regarding the ethical theories. This design choice supports the idea of a game as an anchoring environment that encapsulates the learning cycle (Van Eck, 2009). Drawing upon the game, the teacher introduced bottom-up theoretical connections based on the students' prior experiences and knowledge. Our results align with empirical findings indicating that teachers' contextualisation of instructions with students' experiences and knowledge is beneficial for learning content (e.g. Silseth, 2018). In Part 3, a more top-down approach was used to connect the theories to the game. This type of approach tests connections and promotes progressive formalisation to achieve abstraction and conceptual understanding (Silseth, 2018). The teacher's choice to use both bottom-up and top-down approaches in sequence effectively promoted meaningful learning (de Sousa, in

press). Finally, Part 4 involved a metareflective activity that reinforced students' perception of GBL as a meaningful learning activity (Barab, Pettyjohn, Gresalfi, Volk, & Solomon, 2012; National Academies of Sciences, Engineering, and Medicine, 2018).

Regarding *design for learning*, we point out three features that are important for extending students' engagement beyond the game to engage in meaning-making regarding ethical theories:

1. *Drawing on the nature of the videogame to promote PDE:* Commercial role-playing videogames like *The Walking Dead* are designed to engage and immerse players. The majority of these types of games allow first-person experiences and feature open-ended stories in which players' agency impacts the storyline. Differing from other media, this artefact reinforces *authorisation* because it facilitates appropriation of the narrative in unique ways. Videogames present problems and gradually provide resources that allow a player to solve them. The pleasant but frustrating balance between solving problems with authority and resources is one of the educational design principles (Gee, 2006; Shaffer, Squire, Halverson, & Gee, 2005), which mirror the PDE principles described by Engle and Conant (2002). However, commercial games usually lack the content and disciplinary design to make resources disciplinary. For example, they rarely ask players to *problemati s e* or *account* for their decisions while playing. Importantly, our analysis demonstrates how the teacher's enacted design transformed the game into an educational resource that helped achieve the curricular goal.
2. *Using dialogue to extend engagement beyond the game:* The dialogic teaching observed in this project encouraged a plurality of voices, accepted the co-existence of several perspectives, fostered questions and answers in iterative sequences while meanings were permanently re-constructed and kept the students accountable by asking them to justify their opinions in relation to the curricular content (e.g. 'and what theory is that?'; O'Connor & Resnick, 2008). The trajectory demonstrates how the teacher problematised topics through dialogue from the initial reading activities in Part 1 and throughout all four parts. Technology was used to sustain, broaden and deepen dialogues, and the teacher constantly invited debate by asking questions and elaborating on students' answers to generate new dialogue.
3. *PDE principles assist engagement in GBL to disciplinarily engagement:* When starting the game activity, the teacher mentioned that there were different paths within the game and that the dilemmas would require commitment to personal decisions (*authorising*). She also noted that students' decisions could be inspired by different moral-ethical theories (*accountability)* and positioned the given theories as tools for solving the problems (*resource*s). In Part 2, *problematising* was seen to emerge from the game dilemmas (which were considered legitimate problems) and was maintained over long, immersive, whole-class discussions. The teacher constantly positioned the theoretical framework as a valuable *resource* for reasoning. The second half of the excerpt of part 2 (table 3) shows that the teacher required the students to justify their opinions using theoretical perspectives, promoting *accountability*. The students recognised the theoretical handouts as a relevant *resource*, skimming through the sheets to help them construct arguments during the discussions. In Part 3, *accountability* was supported by requiring students to use the theories presented in the lessons to create arguments. While working in groups, students continued to *problematise*, as we see Iuri doing in the excerpt on table 4. The theoretical handouts and long reflexive silences were used as *resources* for problem-solving, and *accountability* was reinforced by the teacher's use of 'why' questions during students'

presentations to the class. Throughout Parts 2 and 3, the teacher ensured that the locus of agency remained the class. Letting the class decide what should happen in the game *authorised* the students. Also, by embedding theoretical content in the voting options, the teacher made the voting process disciplinary, with options serving as additional *resource*s for problem-solving.

It is also important to note that students' engagement varied along the trajectory in accordance with the multidimensionality of the construct (Fredricks et al., 1994). Despite the teacher's efforts, the discussions in Part 1 were characterised by short question-and-answer sequences. As we consider the length and pattern of students' participation to be a qualitative indicator of engagement (Engle & Conant, 2002). The teacher attempted to involve the students in *conceptual engagement*, using their examples to elaborate upon the theoretical content. This attempt aligns with a well-established finding in GBL studies: there is a need to bridge gameplay with subject practices (Arnseth, 2006; Egenfeldt-Nielsen, 2006).

Parts 2 and 3 involved various forms of participation. Students were given longer turns to talk, and they assumed the role of the protagonist when making choices. In Part 2, during gameplay and open discussions we observed visible emotional displays including laughing, crying, speaking loudly, overlapping, dramatic gesturing and disputational talk (Fredricks et al., 1994; Mercer & Dawes, 2008). Off-task activities were almost non-existent. The students' engagement was evident in their appreciation of the challenge (for example, asking to stay after class). In Part 3, the more structured school-like task lessened the students' engagement. This part also involved long discussions, but discussions between students were more organised, featuring turns. The students used the theoretical handouts, and long silences indicated on-task focus to make meaning concerning the different theories and cognitive engagement (Fredricks et al., 1994). During discussions in Parts 2 and 3, different students were invited to use the theories presented in the lessons to make choices in the game. The enacted design supported the progression of procedural and conceptual engagement to consequential engagement (Gresalfi & Barab, 2011). However, as we saw, it took time and effort to make theoretical connections. It was mainly in dialogical activities in Part 4 that we observed more elaborate forms of consequential and critical engagement. According to Gresalfi and Barab (2011), only certain design principles can lead players to progress from procedural engagement to consequential engagement with a game. In the present case, students made meaning during their active encounter with the tool and through discussions with their peers. Since higher levels of engagement involve the ability to apply knowledge across contexts and make decisions as informed citizens (Barab, 2016), achieving them is especially important for the curricular goals of CE.

Educational implications and recommendations

Videogames represent a central part of young peoples' lives and have the potential to engage students in academic learning. We do not simply defend the use of commercial games in formal education; we recommend that such resources be used with care. This study contributes to knowledge about learning using games as an educational resource and how such resources can be used in combination with more traditional educational resources. We empirically corroborate Hanghøj's (2013) claim that GBL should include (a) a whole learning situation (b) that makes use of the affordances of game design, (c) extending them with pedagogical methods, including diverse educational resources (physical or intellectual) and didactic activities, (d) to intentionally create an engaging learning experience intended to

teach students the selected knowledge. We found that, even when using a commercial game, 'the designed context of videogames can become another context to support whole class discussion and deep engagement with disciplinary content' (Gresalfi & Barab, 2011, p. 301).

Other resources can also be valuable if well integrated into the classroom. In line with an increasing number of studies, we found that not all classroom talk was productive, and we recommend that teachers promote conversations about the game that are critical and constructive and keep students accountable (Mercer & Dawes, 2008; Michaels, O'Connor, & Resnick, 2008). In line with dialogical principles, our study shows the importance of not giving correct answers too early and ensuring that the teacher has the stamina to sustain and support students in creating connections and making meaning about the theoretical concepts (Alexander, 2008).

Finally, we demonstrate that GBL can serve as metaphorical participatory representations of reality and create a dialogic space in which it is possible to test the meaning of theoretical content (Silseth, 2013; Wegerif, 2007; Wiig, Silseth, & Erstad, 2017; Wegerif, 2007). One does not learn complex theoretical content suddenly; it takes time. Hence, we recommend that activities encourage progressively elaborate forms of engagement (Gresalfi & Barab, 2011). In line with previous studies, our results show that consequential and critical forms of engagement are more likely to emerge with the help of post-activity reflections, reinforcing the importance of incorporating post-metareflective activities in lesson designs (Felicia, 2009). Reflection and feedback are essential, and it is important for students to feel like they are part of a learning community with access to diverse learning resources (National Academies of Sciences, Engineering, and Medicine, 2018).

This article contributes to the understanding of learning with games as an educational resource and shows how teachers can use this resource in combination with more traditional educational resources in formal education. Our analysis of the GBL trajectory identified what facilitated students' disciplinary engagement and how this happened. We also made recommendations based on our empirical analysis that may be of interest to teachers attempting to implement GBL.

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Appendix A

Game dilemmas

Dilemma 1	To lie or to say the truth about our past to someone helping us?
Dilemma 2	To rescue a child or an adult, both simultaneously attacked by zombies?
Dilemma 3	To send outside (to zombies) or keep safe inside a child under the suspicion of having already been bitten by a zombie?
Dilemma 4	To risk ourselves to try to save a stranger surrounded by zombies?
Dilemma 5	To help someone already bitten to commit suicide to prevent becoming a zombie?

Appendix B

Transcription notations adapted from Jefferson (1984).

[ ]	Start and end points of overlapping speech
=	Break and subsequent continuation of a single utterance
(# of seconds)	The time, in seconds, of a pause in speech
(.)	A brief pause, usually less than 0.2 seconds
up arrow	Rising pitch or intonation
:::	Prolongation of a sound
Underlined	The speaker is talking louder than the surrounding speech
!-	An abrupt halt or interruption in utterance
°	Whisper, reduced volume or quiet speech
((italic text))	Annotation of non-verbal activity

Name of candidate: Filipa Ferreira Dinis Monteiro de Sousa

Title of thesis: A Dialogic Approach to Game Based Learning: The Role of the Teacher in Students' Engagement with Ethics and Morality in Citizenship Education Using a Commercial Off-the-Shelf Videogame

NOTE: Pages and numbers here mentioned refer to where needed corrections were noted in the previous version. Page and numbers may vary in the already edited version now submitted

Page	Line	Original text	Corrected text	Notes
5	16-18	Appendix 5 – Formal consent forms .....93 Appendix 6 – Formal authorization for the research project by the regulating authorities in both countries 95	Appendix 5 – Formal authorization for the research project by the regulating authorities in both countries .....93 Appendix 6 – Formal consent forms 100	Invert order of appendices 5 and 6, because the order they are presented should be dictated by the order they are mentioned in the thesis' text.
5	24	Sense Publishers	Brill|Sense Publishers. https://doi-org.ezproxy.uio.no/10.1163/9789004388826_004	
6	15	21st-century	21st century	
7	18	ethics	ethical	
8	5	21st-century	21st century	
8	8	has to	The study has two	
8	25	Sense Publishers	Brill|Sense Publishers. https://doi-org.ezproxy.uio.no/10.1163/9789004388826_004	
9	22	rules and time and space limitations	rules, time and space limitations	
12	14	artefacts	artifacts	
12	20	Learning is	As metioned before, learning is	
12	33	used in classroom interactions	, used in classroom interactions,	
13	6-7	namely the role of videogames and teacher-led dialogues as tools in mediating moral reasoning, aimed	namely how the role of videogames and teacher-led dialogues as tools in mediating moral reasoning aim	
14	14	teachstudent	teacher-student	
14	19	*explicit* and *implicit*	explicit and implicit	
14	19	Explicit mediation	*Explicit mediation*	
14	21	Implicit mediation	*Implicit mediation*	
14	37	vs	vs.	
15	16	evidence	evidence,	
16	2	opinions	opinions,	
16	33-34	Dawes, Fisher & Mercer, cited in Mercer & Dawes (2008)	Dawes, Fisher and Mercer, cited in Mercer and Dawes (2008)	
17	12	*Overt instruction* that	*Overt instruction* , which	
17	15	monitoring student progress.	monitoring student´s progress.	
17	36	plat	play	
18	31-32	(Gee, 2003; Newman, 2004). Gee (2003; 2004; 2006) argues that good videogames are good "learning machines" (2004, p. 15)	(Gee, 2003, 2004, 2006; Newman, 2004). Gee argues that good videogames are good "learning machines" (2004, p. 15)	
19	3	reasoning).	reasoning);	
19	5	ones.	ones;	
19	7	(Felicia, 2009).	(see also Felicia, 2009);	
19	36	students' engagement	student engagement	
21	23	create new meaning	create new meanings	
21	35	(Lund and Hauge, 2011, p.262).	(Lund & Hauge, 2011, p. 262).	
21	41	where they	where the authors	
21	42	a)	(a)	
23	4	dialogical approach	dialogic approach	
23	12	dialogical approach	dialogic approach	
24	2	In this chapter, I will review	In this chapter, I review	
24	3	classrooms	classrooms,	
24	3	approach	approach,	

24	28	performance and increased	performance, increased	
25	27	The thesis identified	This thesis identifies	
25	33	Barab, Gresalfi & Ingram-Goble, 2010;	Barab et al., 2010;	
25	41	educational games	educational videogames	
27	8-9	technology within formal learning relies	technology, within formal learning, relies	
27	23	effective games	effective, games	
27	29	of an epistemic game	of epistemic games	
27	38	supplement to rather	supplement to, rather	
28	6	. Videogames may	. According to Van Eck (2009) videogames may	
28	10	(Van Eck, 2009, p. 14).	(p. 14).	
28	25-26	student centered and problem based	student-centered and problem-based	
28	32-33	Egenfeldt-Nielsen (2006, p. 205) described the teacher's role as "imperative for the learning experience."	Egenfeldt-Nielsen (2006) described the teacher's role as "imperative for the learning experience" (p. 205).	
28	39	mentined	mentioned	
29	7	(2009, 420-421)	(p. 420-421)	
29	11	the educational game	an educational game	
29	25	use of COTS	use of COTS videogames	
30	32	ask	asked	
30	34	qualified	qualified,	
31	8	responded	respond	
31	19	citizenship-education	citizenship education	
31	25	An	an	
32	8	a story	the story	
32	40	Raven's	*Raven's*	
32	41	micro-blogging	microblogging	
33	5	Studies shows	Studies show	
33	31	seem	seems	
34	28	re-voicing	revoicing	
35	3	engagement	engagement,	
35	6	phenomena	phenomenon	
36	17	present study.	present study. [paragraph]	
36	17-18	Norwegian Centre for Information and Communication Technologies	Norwegian Centre for Information and Communication Technologies in Education,	
36	20	in upper secondary school in Bergen.	in an upper secondary school in Bergen.	
36	23	The pilot study	[paragraph indent]The pilot study	
36	25	Norway),	Norway,	
36	33	Appendixes	Appendices	
36	36-37	captured which students were involved	captured students' involvement	
37	7	content-unit	content unit	
37	13	*Kahoot* and *Geddit*	*Kahoot* or *Geddit*	
37	18	practice by	practice, by	
37	22	dialogical approach	dialogic approach	
38	5	that that	that	
38	24	are appraised	were appraised	
38	25	is very young	was very young	
38	26	media when	media, when	
38	38	tweet. Considering	tweet. [paragraph] Considering	
40	13	argumentation models	argumentation models,	
41	9	to be involved in.	to involve.	
41	40	market.	market (Ohannessian, 2014).	
43	20	in general compared	in general, compared	
43	25	pause he	pause, he	
43	28	power points slides.	PowerPoint slides.	
44	4	Table 5 summarizes	Table 1 summarizes	
44	7 (legend of table)	*Table 5. Organization*	*Table 1. Organization*	
45	3-4	provide and ask for	provided and asked for	
46	5	Kahoot.	*Kahoot* .	
46	Fig 7	Open-format,	Open format	

47	5	Table 6 illustrates	Table 2 illustrates	
47	7 (legend of table)	*Table 6. Organization*	*Table 2. Organization*	
47	12	PowerPoints	PowerPoint slides	
48	Table 7, line 2	Presentation of theoretical content	Theoretical explanation	
48	Table 7, line 5	Whole-class debates	Open format whole-class debates	
48	13	Table 7 summarizes	Table 3 summarizes	
48	14 (legend of table)	*Table 7. Time*	*Table 3. Time*	
49	14	data-collection	data collection	
49	24	Table 8 summarizes	Table 4 summarizes	
49	26 (legend of table)	*Table 8. Organization*	*Table 4. Organization*	
49	30	a technology room	such technology	
50	9	information	information,	
50	18	Table 9 shows	Table 5 shows	
50	19 (legend of table)	Table 9. Data set	*Table 5. Data corpus*	
50	Table 9, line 2	This data functions	These data function	
50	Table 9, line 4	Appendixes	Appendices	
50	Table 9, line 5	board	board.	
50	Table 9, line 6	activities	activities.	
50	Table 9, line 7	teacher	teacher.	
50	Table 9, line 8	assignments	assignments.	
51	1	Table 10 summarizes	Table 6 summarizes	
51	3 (legend of table)	*Table 10. Organization*	*Table 16. Organization*	
51	16	Table 11 describes	Table 7 describes	
51	17 (legend of table)	*Table 11. Data set*	*Table 11. Data corpus*	
51	Table 11, line 2	22	227	
51	Table 11, line 2	122	120	
51	Table 11, line 2	This data functions	These data function	
51	Table 11, line 4	Appendixes	Appendices	
51	Table11, line 5	interviews with the principal	interview with the principal	
51	Table11, line 5	year	year.	
51	Table11, line 6	activities	activities.	
51	Table11, line 7	teacher	teacher.	
51	Table11, line 8	votes	votes.	
52	8	with participants (students,	(with participant students,	
52	30	videos I developed	videos, I developed	
52	39	explanations and students voting or	explanations, students voting, and	
53	36	interaction analysis	interactional analysis	
54	10	to anchored	to anchor	
54	15	transformative	transformational	
55	9	on a case study design: one in Portugal and one in Norway.	on case-study design.	
55	24	data-collection	data collection	
56	1	data-collection	data collection	
56	18	study;	study,	
56	19	official reports	official reports,	
56	20	purposes but also	purposes, but also for	
58	30	data-collection	data collection	
59	15	case-study	case study	
59	36	psycho-socio	psychosocial	
59	38	politics; and	politics;	
59	40	societies).	societies; and	
60	14	Education.	Education (Appendix 5).	
60	16	(Appendix 5)	(Appendix 6)	
61	2	followed GBL	followed a GBL	
61	4	focused	focuses	
61	21	they	those	
62	7-8	interactions facilitated by the teacher worked	interactions, facilitated by the teache, worked	
62	10	was	were	

62	24	Through	[paragraph indent]Through	
62	30	transformative	transformational	
63	11	transformative	transformational	
63	35	methods	methods,	
65	5	study	study,	
66	23	dilemmas	dilemmas,	
66	26	game	game,	
66	30	citizens because it	citizens, because they	
66	43	content	content,	
67	22	'learning dialogic contexts'.	learning dialogic contexts.	
67	23	Dilseth	Silseth	
67	28	My	[paragraph indent]My	
67	42	Clark et al	Clark et al.	
67	42	(2012,2013).	(2012, 2013).	
68	30	My	[paragraph indent]My	
69	4	knowledge.	knowledge (Rowe et al., 2010).	
70	1-2	activities was also	activities also	
70	41	learning design	educational design	
74	2-3	(Iacovides et al, 2011).	, as defended by Iacovides et al. (2011).	
74	12	ethics	ethical	
75	15	educational and enacted designs	educational designs	
84	15-17	Murray, J. H. (1997). Hamlet on the holodeck: The future of narrative in cyberspace. Free Press. Nash, P. & Shaffer, D. W. (2011). Mentor modeling: The internalization of modeled professional thinking in an epistemic game. Journal of Computer Assisted Learning, 27(2), 173-189.	Murray, J. H. (1997). Hamlet on the holodeck: The future of narrative in cyberspace. Free Press. Ohannessian, K. (2014, July 28). 'Walking Dead' game episodes sell 28 million, will have season 3.Tech Times. https://www.techtimes.com/articles/11417/20140728/walking-dead-video-game-telltale-games.htm Nash, P. & Shaffer, D. W. (2011). Mentor modeling: The internalization of modeled professional thinking in an epistemic game. Journal of Computer Assisted Learning, 27(2), 173-189.	Insert missing reference: Ohannessian, K. (2014)
84	50	Handbook of educational psychology	*Handbook of educational psychology*	
85	36-37	The Dialogical Alternative: Towards a Theory of Language and Mind	, *The Dialogical Alternative: Towards a Theory of Language and Mind*	
85	35-39	Rommetveit, R. (1992). Outlines of a dialogically based socio-cognitive approach to human cognition and communication. In A. H. Wold (Eds.) The Dialogical Alternative: Towards a Theory of Language and Mind (pp. 19-44). Scandinavian University Press. Sabourin, J. & Lester, J. (2014). Affect and engagement in game-based learning environments. Transactions on Affective Computing, 5(1), 45-56. https://doi.org/10.1109/t-affc.2013.27	Rommetveit, R. (1992). Outlines of a dialogically based socio-cognitive approach to human cognition and communication. In A. H. Wold (Eds.) The Dialogical Alternative: Towards a Theory of Language and Mind (pp. 19-44). Scandinavian University Press. Rowe J.P., Shores L.R., Mott B.W., Lester J.C. (2010). Integrating Learning and Engagement in Narrative-Centered Learning Environments. In: V.Aleven, J. Kay, J. Mostow (Eds) I*ntelligent Tutoring Systems. ITS 2010. Lecture Notes in Computer Science* , 6095. Springer. https://doi-org.ezproxy.uio.no/10.1007/978-3-642-13437-1_17 Sabourin, J. & Lester, J. (2014). Affect and engagement in game-based learning environments. Transactions on Affective Computing, 5(1), 45-56. https://doi.org/10.1109/t-affc.2013.27	Insert missing reference: Roew et al. (2010)
85	44	(Eds)	(Eds.),	
88	31-33	Appendix 5 – Formal consent forms Appendix 6 – Formal authorization for the research project by the regulating authorities in both countries	Appendix 5 – Formal authorization for the research project by the regulating authorities in both countries Appendix 6 – Formal consent forms	Invert the order of appendices 5 and 6, including their content
92	17-18	classification of ethics theories	classification of ethical theories	
93	1	Appendix 5	Appendix 6	
95	1	Appendix 6	Appendix 5	