The Dramaturgy and Didactics of Computer Gaming

A Study of a Medium in the Educational Context of Kindergartens

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Scientific environment

Since the early nineties, I have been employed as an associate professor at Stord/Haugesund University College (SHUC). I am a qualified teacher from Bergen University College and hold a masters degree in Drama in Education from University of Durham, England. My earlier working experience is from primary and lower secondary schools as well as from *Vestlandske Teatersenter* (VT), which is a resource centre for drama and theatre located in Bergen. At VT, I was employed as artistic director and educational leader.

In the period 2009–2013, I have been employed as a PhD research fellow at SHUC, which also has financed this PhD project. During this period, I was part of the NFR funded research project *Digital Objects in Children`s Social and Linguistic Growth in Kindergartens* (DIGOB) under the leadership of professor Knut Steinar Engelsen, and my PhD study is an independent part of this project. The Department of Education, Faculty of Psychology at the University of Bergen (UoB) has been the affiliation department. I have been a member of the research group Digital Learning Communities (DLC), and I have participated in the Western Norway Graduate School of Educational Research (WNGER). In addition, I have been a member of National Graduate School in Educational Research (NATED).

My main supervisor has been Professor Rune Johan Krumsvik, the Department of Education, Faculty of Psychology at UoB. My co-supervisor has been Associate Professor Kjetil Sandvik, Department of Media, Cognition and Communication at the University of Copenhagen. Professor Krumsvik has been a co-author of one of the articles and Associate Professor Nils Tore Gram Økland from Stord/Haugesund University College (SHUC) has been a co-author of two of the articles.

The Norwegian Research Council (NRC) has provided financial support for data collection since my project was part of the DIGOB project.

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Special thanks go to Nils Tore Gram Økland, my colleague at SHUC and co-author of two articles, for his valuable contribution. We collected the data together in partnership, experiencing the joy of being part of daily life in four different kindergartens. We challenged each other in endless theoretical and methodological discussions as we drove across the region. In addition, we practically shared an office for a couple of years as we continued our philosophical debates. And finally, we wrote two of the present articles together.

I would also like to thank the members of the research group Digital Objects in Children`s Social and Linguistic Growth (DIGOB) at Stord/Haugesund University College and Knut Steinar Engelsen, Margrethe Jernes, Nils Tore Gram Økland and Lars Kvinge for valuable collaboration throughout the research project. Knut Steinar Engelsen also deserves thanks for inspiring me to embark on this project as well as for his support throughout the project. My work has benefited as well from the wise counsel of many of my colleagues at SHUC.

This doctoral thesis could not have been completed without my informants. I am grateful to the four research kindergartens, the pre-school teachers, the children and the families of the children who participated in the study.

A very important factor in this PhD project has been my experience as a visiting research scholar at the University of California, Irvine (UCI), where I had the pleasure of being part of the academic faculty at the Center for Computer Games and Virtual Worlds, which is part of the School of Information and Computer Sciences. I want to mention Walt Scacchi, the founding director of research at the centre, for his great inspiration. In addition, I was lucky

enough to be included in the School of Education`s academic programme, and I want to thank Mark Warschauer and Joshua Lawrence in particular for generously sharing their insights and perspectives and for inviting me to hold a brown-bag presentation about my project at the School of Education. I give special thanks to NATED, UoB and SHUC, which offered me grants and made this academic challenge possible. In addition, I would like to thank all my new “colleagues” at UCI, who gave of their precious time, challenged me to do workshops and lectures, and encouraged my work.

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Abstract

The overall aim of the study has been to gain knowledge about computer games used in an educational context. In my research, I have analysed and interpreted the game`s characteristic interactive dramaturgy exposed in the interplay between the game and the gamer and integrated in the medium itself. I have looked specifically at the challenges that the educator faces in the didactic interaction when computer games are introduced in Norwegian kindergartens as a medium for learning and exploration.

The first part documents, interprets, and explains the style and genre aspects of *the medium* of computer games as they currently exist, and the latter part, documents, interprets, and analyses the roles the *participants* of the educational communicative process take.

The main research question considered by the dissertation is divided into three parts:

- *How can we interpret, understand and analyse educational computer games as a medium featured by its sociological and cultural context?*
- *How do the teacher, child and medium interact when this medium is implemented in educational contexts?*
- *What will be the central didactic implications?*

The entire study draws from an interdisciplinary methodological frame that combines a hermeneutic approach with phenomenology and ethnography when studying the medium of computer games and its implementation in Norwegian kindergartens. One important role of ethnography is to make visible everyday activities and throw light at different perspectives that otherwise are difficult to access. My overall research perspective is embedded in hermeneutics as a philosophical way of understanding phenomena and human interaction. Inspired by European philosophers like Gadamer (2006), I think that understanding occurs through a fusion of horizons, which is a dialectic between the pre-understandings of the research process, the interpretive framework and the sources of information (p. 835). There cannot be a finite set of procedures to structure the interpretive process because interpretation arises from pre-understandings and a dialectical movement between the parts and the whole of the texts of those involved.

Since educational computer games implemented in didactic contexts is the topic of examination in this study, I have chosen to put the medium at the centre of the didactic triangle and have named the model the extended didactic triangle (Figure 1). The dissertation emphasizes in particular the medium itself and the role of the teacher, both being important parties of the extended didactic triangle. The specific interest in Article II and III is the role of educators when computer games are used as a learning tool in kindergartens.

This first sub-study is a theoretical discussion of the potential of computer games as a learning tool in a child's interactive game play, and the first article *A dramaturgic perspective: Seeing digital role-plays as drama and theatre. What are the epistemological and pedagogical consequences?* (Vangsnes, 2009) presents an overview of relevant research and theory in the field in order to identify the research area and thus serves as a backdrop to crystallise my own theoretical and analytical position. The interest in the medium itself and how the computer game dramaturgically is constructed to communicate with its recipients is the main content of this sub-study which addresses the research question: *How can dramaturgy be a supplementary theoretical tool for analysing computer games and their learning potential.* This research question is derived from the first part of my main research question.

This first article introduces dramaturgy as a theoretical perspective in supplement to narratology (Ryan, 2001; Murray, 1997) and ludology (Aarseth, 2003; Frasca, 2003; Juul, 2005; Pearce, 2003) in order to interpret and analyse computer games and the gaming process. My theoretical framework is thus derived from a dramaturgic position. This does not mean that I consider ludology and narratology to be without current interest as insightful ways of understanding the phenomenon, but rather the opposite way around. A main conclusion is that all three theoretical positions are relevant and make important contributions to understanding the phenomenon and that they are complementary rather than mutually exclusive. The theoretical framework constitutes my macro-perspective and links my selective empirical microanalysis with my conceptual macro-perspective.

The research questions of the two empirical sub-studies also seek to understand the phenomenon, but now the focus is more directed towards the didactic use of the computer games, more specifically I examine the implementation of educational computer games in Norwegian kindergartens with a specific interest in the teacher`s role. This part of the study

aims at exploring the phenomenon in the cultural context of the kindergarten, and I have chosen to focus on the child–game interactivity as well as the child–game–teacher interactivity and interaction.

Sub-study II presented in Article II, *Computer games in pre-school settings: Didactical challenges when commercial educational computer games are implemented in kindergartens* (Vangsnes, Økland, & Krumsvik, 2012), is an empirical examination based on dramaturgic theories of the teacher's professional dilemmas when computer games are taken into didactic practice. This sub-study includes the following research question: *What didactical challenges does the pre-school teacher face when commercial educational computer games are implemented in kindergarten?* This research question derives mainly from part two and three of my main research question, even though part one forms a basis for the dissertation as a whole. In order to answer the research question, a microanalysis of a gaming situation was conducted where the pre-school teacher`s intention is to expand the learning potential of the game by involving the teacher. I contextualized these challenges by regarding the pre-school teacher`s practice in the gaming situation on the basis of guidelines in policy documents and the pre-school teacher`s understanding of professional practice as expressed in interviews.

Since this is a didactic context, the pre-school teacher will take into account two aspects of the concept of *content*; the subject matter that is materialized in the game and the medium competences (genre competence as well as technical competence) that are materialized in the gaming. All media consist of both form and content. A medium is a handed-over cultural utterance that frames or functions as an arena for our expressions. But the medium is not only form, it consists as well of content, and both form and content are carriers of meaning. The content is expressed through and by virtue of a form, and the form is constructed to communicate certain content since the content is both a factor in the process as well as in the product itself. In my extended didactic triangle (Figure 1), the *medium* is situated in the middle of the model because the medium, in other words the game, as well as the use of the medium is the centring point I describe and analyse. This study shows that the pre-school teacher is more or less absent during the children's computer gaming, but when the pre-school teacher is involved, he or she finds it difficult to realize the ideal socio-cultural didactic project in which dialogue is a central medium for exploration and learning. The results of my analysis show that there are two different dramaturgies at stake: the built-in

interactive dramaturgy of the game and the dialogical dramaturgy that the pre-school teacher tries to create in the didactic situation. This article launched the term *didactic dissonance* to capture the tensions that arise in didactic situations primarily because the participants (teacher and child) encounter the computer gaming situation with different roles, functions and expectations.

The third sub-study, which as well is empirical and presented in Article III, *Didactic Dissonance, teacher roles in computer gaming situations in kindergartens* (Vangsnes & Gram Økland, 2013) addresses the research question: *How does the pre-school teacher respond to the didactic dissonance that arises when educational computer games are used in kindergartens?* This research question is also mainly derived from part two and three of my main research question. In this study, I elaborate on the concept of didactic dissonance, developed in Article II, by emphasizing the teacher's role and discussing this in light of dramaturgic theories. The aim of this case study was to examine the professional dilemmas pre-school teachers encounter when computer games are played by children aged 4 and 5 in Norwegian kindergartens. My claims relate to the challenges that occur when teachers either interact or simply organise the gaming situations.

The findings indicate that in computer gaming situations in kindergartens, the pre-school teacher's function can be viewed in a continuum. On one extreme are the teachers who take intervening roles, and on the other extreme are the teachers who choose to restrict themselves to taking on organizing or distal roles. This study shows that both the intervening position and the organizing or distal role are challenging. An intermediate position, in which the teacher is a contributor and encouraging bystander, is an alternative role. The term didactic dissonance is suggested to capture the challenges and tensions in didactic situations where teacher and child participate with conflicting roles and expectations. Didactic dissonance may help educators reflect on teacher roles in didactic contexts. My study emphasizes the medium itself, the computer game, which from my point of view, provides a central premise for the interaction in a didactic context.

The synopsis aims to bind the elements together in order to summarize and synthesize as well as show how the findings of the different sub-studies interrelate and complement each other. The synopsis suggests transforming Mishra and Koehler`s (2006) model of technological pedagogical content knowledge into media pedagogical content knowledge, which makes the model more adequate to general didactics as well as to different subject

didactics. In order to conclude the doctoral dissertation, I finish the synopsis by suggesting a new didactic model built on my theories, analysis and findings, called a dramaturgic didactic model.

List of publications

Article I

Vangsnes, V. (2009). A dramaturgic perspective: seeing digital role-plays as drama and theatre. What are the epistemological and pedagogical consequences? *Nordic Journal of Digital Literacy, 4*(1), 20–37.

Article II

Vangsnes, V., Økland, N. T., & Krumsvik, R. (2012). Computer games in pre-school settings: Didactical challenges when commercial educational computer games are implemented in kindergartens. *Computers & Education, 58*(4), 1138–1148.

Article III

Vangsnes, V., & Økland, N.T. (2013). Didactic dissonance - Teacher roles in computer gaming situations in kindergartens. Accepted and published online by *Technology, Pedagogy and Education.* DOI: 10.1080/1475939X.2013.853686

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1. General introduction

The dissertation concerns 4- and 5-year-olds playing educational computer games in kindergartens, the specific dramaturgic characteristics of this medium and how the practitioner`s professional roles are challenged when this new medium is implemented in kindergartens. The thesis contains a synopsis, three articles and eight appendices.

The first chapter describes the research context and the rationale of the study and contains a paragraph about ontology and epistemology. An important part of a doctoral thesis is a literature review, and the complex nature of education research makes this part vital for the development of the research questions, which follow the literature review. This first chapter is completed by a summary of the coherence and aims of the articles.

The following theory chapter addresses dramaturgy and didactics as theoretical foundations of the dissertation and includes an examination presenting the difference between interactivity as manifested between gamer and game during the gaming process, as well as social interaction as manifested between human beings.

Chapter 3 describes the methodology of the thesis and contains a description of the overall foundation as well as the research design and methods. The chapter is concluded with the principles of analysis and reflections about trustworthiness and ethical considerations.

The main findings are presented in Chapter 4 and are followed by discussions of the main findings in Chapter 5. This final chapter discusses some of the implications and problem domain characteristics. As one particular implication, I suggest adding a dramaturgic perspective to didactics, which hence appears in what I have called a dramaturgic didactic model. The implication chapter is quite long and extensive due to the novel field. The chapter closes with recommendations for further research on the topic and some conclusions.

1.1 Background/rationale

Computer games are central in modern child culture. These games have become a very popular genre when it comes to entertainment, marketing, art and even education/learning. An important part of children`s culture has a digital dimension: first of all, the culture/media

that is produced for children, for example, computer games. But even the children`s culture has a digital dimension; playing digital games is a particular child-cultural activity/utterance in which children use the media as a raw material in their own play culture. Play-culture and media are often infiltrated into each other today in a way that makes the media important and a necessary foundation for a lot of today`s playing (Rønnberg, 2009a; 2009b; Thestrup, 2011). This is called media-play.

Computer games are on the political agenda. During the spring of 2008, we got the first White Paper about computer games in Norway, showing that our government is taking the phenomenon and the play generation seriously. It is now made explicit that children and youths must get access to high quality games based on Norwegian language and culture (2007 – 2008).

Computer games are used in a majority of Norwegian pre-schools. A Norwegian national survey carried out in 2010 showed that 61 % of Norwegian pre-schools offered children the opportunity to play computer games (Kvinge, et al., 2010). The most common category is the so-called *play and learn* games where the series about *Josefine* and the series about *Labbe Langøre,* are the most used (ibid). These are often called commercial educational computer games (Egenfeldt-Nielsen, 2005). I have decided to just call them educational computer games because the label *commercial* is difficult since all games produced for sale are in fact market-driven and commercial. By using the term *educational*, I want to focus on the aim of the games and the rhetoric the producers use in order to communicate with parents and educators on behalf of the children; in other words, these are games that speak to the children through grown-ups. In contrast to books, computer games have not been considered a vehicle for achieving basic and cultural literacy; on the contrary, they have rather been considered to be illiterate, violent and non-academic. In her cultural history of children`s software, Mimi Ito describes how creators of educational software started framing their products as being educational and enriching. In this way, the game companies managed to find a way to communicate with social groups that struggle to appropriate and position the meaning and value of new forms of media (Ito, 2009, p. 35).

Since computer games have become a vital part of today's culture and have also been admitted as pedagogical tools, it has thus become an important research topic, comprising research on the game phenomenon as well as educational research on games as a medium for

learning. My particular research project merges into a growing body of ethnographic case studies aiming at contributing to a more holistic picture of the role of new media in educational contexts. My contribution offers dramaturgy in understanding the significance of computer games as well as to the didactics of educational computer gaming in kindergartens. Katie Salen, editor of *The Ecology of Games: Connecting Youth, Game, and Learning* (2007), argues:

> Although there has been a considerable amount written on games and young people`s use of them, there has been little work done to establish an overall "ecology" of gaming, game design, and play, in the sense of how all the various elements – from code to rhetoric to social practices and aesthetics – cohabit and populate the game world. (Salen, 2007, pp. 2 – 3)

My doctoral thesis will contribute to fill in a bit of this gap by focusing on game theories and on how game-play practice and activity are situated within the social and structural context of kindergartens and what happens when the different discourses of the child/children, practitioner and media meet and interact. My main contribution is thus a novel theoretical perspective, and my proposals offer an alternative viewpoint on didactics.

1.2 Research context

The doctoral thesis consists of three sub-studies, each of these presented in three articles. The research context of Sub-Study I is the games per se and the growing body of theoretical research on computer games. Prensky (2001) defined computer games as organized play that includes six key structural elements: rules, goals and objectives, outcomes and feedback, conflict/competition/challenge/opposition, interaction, and representation or story. I agree with this categorization, but since dramaturgy is my theoretical and analytical focus, I have chosen to look more carefully into how representation/story and interaction might contribute to the meaning creation process. My hypothesis is that dramaturgy, and especially interactive dramaturgy, can offer new insight about the form and structure of the digital game and about the didactic interactive communicative process between gamer, game and educator. My doctoral thesis is not connected to certain game genres, even though games often defined as role-playing games are of specific interest, especially in Sub-Study I. Nor do I look particularly at educational games in Sub-Study I; rather, I inspect the learning

potential of computer gaming as such. Rather than assume that specific games with educational purpose determine the educational outcome, I examine what learning properties there are in *all* games that mobilizes for learning. Today`s games and Web 2.0 enable communication that fosters a social learning environment that supports new forms of peer-based learning (Gee & Hayes, 2011), and a large body of educational research argues that gaming enhances technical literacy and develops scientific reasoning, problem solving, literacy acquisition and pro-social behaviours (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Dede, 2009; Steinkuehler, 2008). In contrast, my contribution lies in bringing humanistic insights and methods to the field of game research, exemplified through the theories of dramaturgy, in order to analyse the game, its learning potential and its didactics.

The first empirical part of my thesis (Sub-Study I) is related to the computer game itself and the theoretical frameworks used for analysing computer games. This is a hermeneutic study because I think interpretive methods constitute research data relevant to theory. The most commonly used theories I found were based on narratology (Harris & Young, 2009; Murray, 1997; Riedl & Young, 2011; Ryan, 2001) and ludology (Aarseth, 2003; Frasca, 2003; Juul, 2005; Pearce, 2003). In addition, I found that there was a growing body of research in Denmark focusing on dramaturgy (Sandvik, 2003, 2004, 2006a, 2006b; Szatkowski, 2006; Vangsnes, 2009) as a theoretical framework for examining digital games. Since this is an important part of my educational and theoretical background, it was natural for me to choose this as my theoretical lens. Inspired by the Danish researcher Kjetil Sandvik, I interpret the computer game to be an interactive multimodal performance. Additionally, I interpret the teacher`s staging of content as a performance. Consequently, I wanted to explore dramaturgy as a theoretical and analytical perspective on computer games used in pedagogical contexts.

The other empirical parts of the thesis (Sub-Study 2 and 3) investigate 4- and 5-year-olds playing *educational* computer games in kindergartens, the specific dramaturgic characteristics of this medium and how the practitioner`s professional roles are challenged when this new medium is implemented in kindergartens. By educational, I mean that the game is developed for formal learning but wrapped in a rich and evolving simulated virtual world.

Picture 1: Snapshot of children playing together in the common room.[1]

Picture 2: Snapshot of boy playing *Josefine and Sofus in the Carrot Park.*

Picture 3: Snapshot of situation where the pre-school teacher is present.

[1] The use of pictures is approved by the parents/guardians and the Norwegian Social Science Data Services.

By providing a systematic analysis of one popular computer game and in-depth case studies of educational computer games in use, the thesis explores the interactions and interactivities that take place when the computer game is the core medium of the didactic process. The commercial edutainment game *Josefine and Sofus in the Carrot Park* (JSCP) is representative of a game category that many pre-school teachers regard not only as an acceptable pedagogical tool but even as a positive contribution to the pre-school`s teaching because of its focus on academic tasks and conceptual learning wrapped in an entertaining form. The main aim of the activities is for the gamer to gain as many points as possible by giving correct answers.

1.3 Personal and practical goals (my motivation for the study)

After completing my teacher training education in Bergen and working for a couple of years in elementary and secondary school, I finished a master of art degree in drama in education at the University of Durham, England. Being an associate professor at Stord/Haugesund University College for many years has given me many academic challenges, such as participating from 2008 to 2011 in the DIGOB (Digital Objects in Children`s Social and Linguistic Growth) research project, funded by the Norwegian Research Council (NRC) (Engelsen, Jernes, Kvinge, Vangsnes, & Økland 2011). Reviewing hermeneutic literature on the field, I found that theories related to *narratology* and *ludology* had been preferred when analysing this new medium. Inspired by my co-supervisor Kjetil Sandvik and Danish computer game research, the first part of my PhD study was about using *dramaturgy* as a supplementary theoretical and analytical tool for interpreting characteristic features of computer games. Since teacher training is my profession and the implementation of digital tools in kindergarten was DIGOB`s research field, it came natural to incorporate *didactics* as my complementary theoretical foundation. As a result, I have wanted to accomplish a deeper understanding of the dramaturgy of computer games and what challenges it causes for the pre-school teacher when the computer games are implemented in kindergartens.

1.4 Relevant research

Boote and Beile (2005) argued that a thorough and sophisticated literature review is a necessary foundation for all research, and it is of vital importance to acknowledge other scholars` research. Maxwell (2005) agrees but distinguishes between reviews *of* and *for* research. His main point is that how relevant previous studies are for one`s own study is of vital importance for conducting reviews *for* research. Maxwell argues that every single study that is included in a selective review should inform or support one`s study, and consequently, it is important to ask why a particular study or reference is included in a work (ibid p. 59). This includes the justification for the study, the goals, the theory, the conceptual framework, the design and the principles of analysis. I have used a phenomenological hermeneutical approach when researching computer games and gaming in order to investigate and try to understand the essence of the studied phenomenon. Creswell (2009) suggests that a literature review accomplishes several purposes:

> It shares with the reader the results of other studies that are closely related to the one being undertaken, it relates a study to a the larger, ongoing dialogue in the literature and it provides a framework for establishing the importance of the study as well as a benchmark for comparing the results with other findings. (Creswell, 2009, p. 25)

To accomplish these criteria, Creswell (2002) recommends a five-step process for "identifying terms to typically use in your literature search; locating literature; reading and checking the relevance of the literature; organizing the literature you have selected; and writing a literature review (p. 86)".

Based on Creswell`s recommendations, I have conducted a literature review on education and learning with computer games in kindergartens. The overview on relevant theories examined in Article I helped me, as Maxwell pointed out, to crystallize my focus and my own theoretical platform. This established the principles for my analytical approach as well. To frame this focus, I start out by writing about computer game research in general in order to categorize the present cutting edge of computer game research. My literature review had an explorative entrance, comprising database searches in *Eric*, for instance, as well as reading review articles on the field. But it was also influenced by the fact that I have been a scholar in the field for many years.

In the last decade, game studies have become a scholarly field in which researchers in media, art, culture and history have made significant contributions. There are many regularly scheduled international conferences addressing computer game research, and many peer-reviewed journals are devoted specifically to computer games research. Some of these emphasize the connections between traditional humanities fields and technology. It is emphasized in Scacchi`s report from the University of California, Irvine (Scacchi, 2012) that the most important prior work thus far on these research questions has emerged from three directions: a) from *practice-based research*, where the approaches of media arts, technology research and independent game production come together to produce novel game experiences infused with university research approaches; b) from *hybrid humanities*, where humanistic insights and methods are connected to the specifics of media technologies; and c) from information scientists and digital archivists working with *big data*, where the archival expertise of humanities is combined with new technical approaches in data mining and knowledge discovery.

A growing volume of research examines computer games from the *hybrid humanities* perspective, where for instance narratology (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Harris & Young, 2009; Murray, 1997; Riedl & Young, 2011; Ryan, 2001) and ludology (Aarseth, 2003; Frasca, 2003; Juul, 2005; Pearce, 2003) as well as dramaturgy (Sandvik 2003, 2004, 2006a, 2006b; Szatkowski, 2006; Vangsnes, 2009) have been used as theoretical lenses in order to gain a deeper understanding of computer games as part of a broader set of social structures and cultural patterns. Represented by avatars, users engage in mediated social interaction, including a full range of social interaction and contact (Schroder, 2002; Vangsnes & Gram Økland, 2013). Computer games are designed to foster social interaction and the formation of groups and communities (Johnson & Levine, 2008).

There are several (though not many) literature reviews dealing with more general empirical overviews and the effects of computer games in general and serious[2] games in particular (Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012; Minovic, Milovanovic, & Starcevic, 2013), and qualitative meta-analyses of computer games as learning tools have been conducted by Ke (2009), for instance. The literature surrounding computer games and

[2] I have chosen to use the term *educational* instead of *serious* or *edutainment*.

education is vast, and computer games have been anticipated as a potential learning tool with great motivational appeal. Educationalists have investigated the potential that exists for computer games as a tool for learning (Gee, 2003; Prensky, 2001; Shaffer, 2006, 2012; Squire, 2011), and Ke (2009) has raised the substantial question as to what basic insights the literature provides on the design and application of computer games for learning.

Many articles and reports are written on the topic, but rather few are on young children playing computer games in the context of kindergartens. To date, there have been few research-informed accounts of the use and impact of computer gaming in didactic contexts in pre-schools. The fact that no reviews have been published in this field (as of November 2013) is surprising if we consider the public interest in this area. However, related studies have been conducted and have examined the various effects of digital media on young children's learning. Several reviews have identified the important strengths and limitations of digital media for this age group (Lieberman, Bates, & So, 2009), and some digital media studies have also included computer games as a medium of interest. Conolly et al. (2012) published a review of research literature on computer games in regard to the potential positive impact of gaming with respect to learning, skill enhancement and engagement. They referred to Sweetser and Wyeth (2005), who have claimed that understanding game usability has been a priority over understanding game enjoyment in computer game research and literature.

My specific interest in this doctoral thesis is the role of educators when computer games are used as a learning tool in kindergartens. A few studies have looked specifically at this didactic role (Nir-Gal & Klein, 2004). Their findings indicate that children who engage in adult-mediated computer activities improve their cognitive performance compared with children who engage in computer activities without adult mediation or with very little mediation. Other important studies in the field are those of Ljung-Djärf (Ljung-Djärf, 2002; 2004), Plowman and Stephen (2007) and Stephen and Plowman (2012). Ljung-Djärf focused on the role of the pre-school teacher in relation to the use of computers in general and computer games in particular. Plowman and Stephen introduced the concept of guided interaction, highlighting educators' active support of children's interactions with information and communications technology (ICT) through verbal and nonverbal communication, either *proximal* (direct support) or *distal* (more indirect support). Even though their research is not mainly about computer gaming, there are important areas that overlap with my study, that is,

our common focus on the interaction and the role of educators when technology is part of the didactics in kindergartens. One conclusion is that an intimately involved adult who participates through *guided interaction* is of vital importance for a good learning outcome. Plowman and Stephen`s research showed that through guided interaction, pre-school teachers demonstrated, instructed and organized the activities. In addition, they participated in joyful interplay and gave positive feedback and support. A *distal position* refers to facilitation and monitoring of activities such as computer games. International research in this area has often pointed out that implementing digital tools in day care facilities requires that the teacher has knowledge and awareness about its use (Sheridan & Pramling Samuelsson, 2003). Some studies have looked specifically at the relationship between children and pre-school teachers' expertise in the field and what impact this has on the interaction between children and adults in situations where digital tools are included (Jernes, M., Alvestad, M., & Sinnerud, M., 2010; Jessen, 2001; Klerfelt, 2004). This research clearly indicates the importance of the teachers' participation (Engelsen, Jernes, Kvinge, Vangsnes, & Økland 2012b; Plowman & Stephen 2007).

In general, pre-school teachers regard the use of computers and computer games as fruitful for children (Kvinge et al., 2010; Engelsen, Jernes, Kvinge, Vangsnes, & Økland 2012a). However, they are not satisfied with the way children tend to use computers and games if the gaming is not under the supervision and control of a pre-school teacher.

1.5 Research questions

The main research question considered by the doctoral thesis is divided into three parts:

- *How can we interpret, understand and analyse educational computer games as a medium featured by its sociological and cultural context?*
- *How do the teacher, child and medium interact when this medium is implemented in educational contexts?*
- *What will be the central didactic implications?*

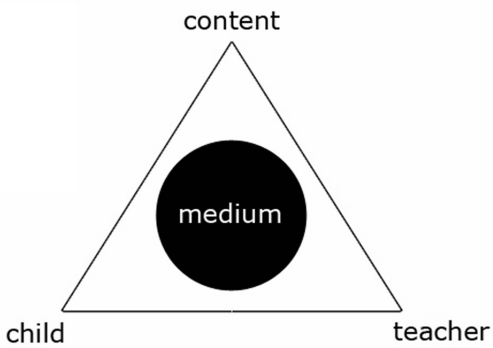
The overall aim of this thesis is to gain knowledge about computer games used in an educational context. I have analysed and interpreted the game`s characteristic interactive

dramaturgy exposed in the interplay between the game and the gamer and integrated in the medium itself. I have examined specifically the challenges that the educator faces in the didactic interaction when computer games are introduced in Norwegian kindergartens as a medium for learning and exploration. In this way, my doctoral thesis will contribute to understanding more about how the various dramaturgic elements structure the computer games and how we can contribute to an understanding of the didactics of a medium from this vantage point. My contribution is described in three sub-studies.

The first sub-study documents, interprets and explains the style and genre aspects of *the medium* of computer games as it currently exists, and Sub-Study II and III document, interpret and analyse the challenges and the roles *participants* in the educational communicative process take.

Since educational computer games implemented in didactic contexts is the topic of examination in this thesis, I have chosen to put the medium at the centre of the didactic triangle and have named the model the extended didactic triangle (Figure 1). This doctoral thesis emphasizes, in particular, the medium itself and the role of the teacher, both being important parties of the extended didactic triangle.

Figure 1. The Extended Didactic Triangle



The interest in the medium itself and how the computer game dramaturgically is constructed to communicate and interact with recipients is the main content of the first sub-study. Article I addresses the research question: *How can dramaturgy be a supplementary theoretical tool for analysing computer games and their learning potential.* This question is derived from the first part of my main research question and is followed by three sub-questions in order to narrow the focus of the study:

What kind of interaction do digital role-plays invite their players to perform?

What pedagogical perspectives on computer games and their pattern of interaction can be seen when analysing them as a means of a theatrical practice?

What aspects of the learning process will be examined when a dramaturgic theoretical perspective is used as a basis for analysing educational computer games?

The aim of Sub-Study I was to formulate a general analytical framework for analysing digital role-plays by drawing on *dramaturgic theory*. The first article, based on Sub-Study I, presents an overview of relevant research and theory in the field in order to identify the research area and thus serves as a backdrop to crystallise my own theoretical and analytical position.

The research questions in the two next empirical sub-studies also seek to understand the phenomenon, but now the focus is more towards the didactic use of computer games; more specifically, I examine the implementation of educational computer games in Norwegian kindergartens with a specific interest in the teacher`s role. This part of the study aims at exploring the phenomenon in the cultural context of the kindergarten, and I have chosen to focus on child–game interactivity as well as child–game–teacher interactivity and interaction.

Sub-Study II, presented in Article II, includes the following research question: *What didactical challenges does the pre-school teacher face when commercial educational computer games are implemented in kindergartens?* This research question derives mainly from part two and three of my main research question, even though part one forms a basis for the dissertation as a whole. My research was directed towards the observation of interactivity between the pre-school teacher, the children and the game in order to understand why the pre-school teacher often seems to abdicate from the gaming situations. The aim of this case study is therefore to examine the pre-school teacher`s participation in settings where computer games are used by the children. The educators thus formed the specific group of interest, and their inclusion was in recognition of the role they play when computer games are played in kindergartens. In order to answer the research question, I conducted a microanalysis of a gaming situation where the pre-school teacher`s intention is to expand the learning potential of the game by becoming involving. I contextualized these

challenges by regarding the pre-school teacher`s practice in the gaming situation on the basis of guidelines in policy documents and the pre-school teacher`s understanding of professional practice as expressed in interviews.

The third sub-study, presented in Article III, addresses the research question: *How does the pre-school teacher respond to the didactic dissonance that arises when educational computer games are used in kindergartens?* This question also mainly derives from part two and three of my main research question. In Article III, I elaborate on the concept of didactic dissonance, developed in Article II, by emphasizing the teacher's role and discussing this in light of dramaturgic theories. The aim of this case study was to examine the professional dilemmas pre-school teachers encounter when computer games are played by children aged 4 and 5 in Norwegian kindergartens. My claims relate to the challenges that occur when the teachers either interact or simply organise the gaming situations (or take different roles/positions).

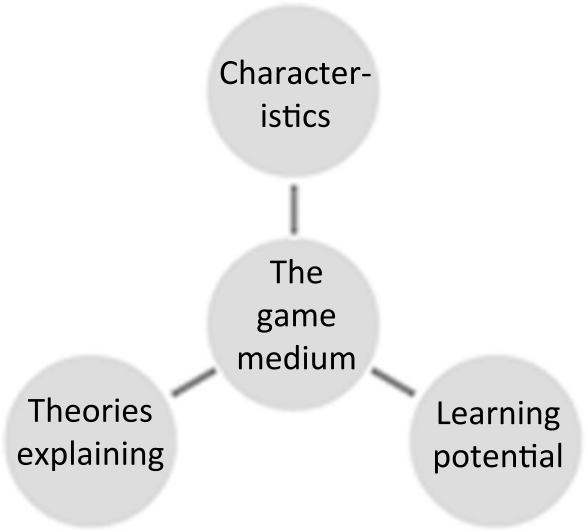
As a whole, my doctoral thesis thus contributes to the public debate by considering computer gaming in didactic contexts. But it is embedded in a broader set of didactic ecologies where the most important aim is to stay close to the empirical material to provide a descriptive base and set of frameworks for understanding the educational computer game itself in addition to looking specifically at the teacher's role in didactic computer gaming situations.

1.6 Coherence and aims of the articles

The doctoral thesis consists of four main elements materialized in three articles and a synopsis. The first article presents an overview of existing theories on computer games and shows how dramaturgy can be an appropriate theoretical tool for interpreting computer games and their potential for learning. The second and third articles are descriptive-analytic articles based in the ethnographic study of computer games in kindergartens. The synopsis encompasses and binds the three studies together. The coherence appears on different levels; first there is the coherence between the overview study and the empirical ethnographic study. The work on this dissertation started with the interest in computer games and how my theoretical foundation in dramaturgy could be a tool for analysing and interpreting these games. Among all game genres, it became natural from this dramaturgic point of view to concentrate on role-playing games. The work started with searching for hegemonic

theoretical foundations. I found, as mentioned already, that narratology and ludology were the two opposing theoretical positions taken by scholars. In addition, there was a growing research body, especially in Denmark, that was interested in dramaturgy as a theoretical approach for examining computer games. Another important aspect was my profession as teacher educator where pedagogy is one core subject. This formed the interest in computer games for learning. The first study thus became a) a reflection of the state of the art and an overview of the scientific field achieved at that particular time, b) an argument for using dramaturgy as a supplementary theoretical approach and c) a discussion about what parts of the learning process will be highlighted if dramaturgy is the lens through which we examine the phenomenon. This means that the first study is a theoretical study of the medium itself, its characteristics, theories and learning potential.

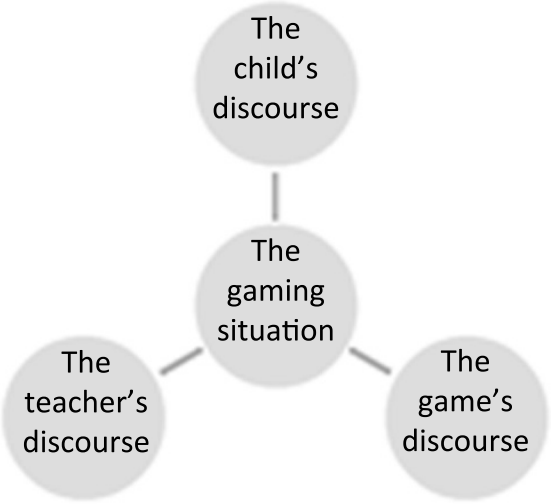
Figure 2. Article I - A Dramaturgic Perspective on Computer Games and Gaming



The overview identified a need for in-depth case-studies of children playing computer games in educational contexts. Because of the educational environment studied in this research project, I chose to look at what types of games, among other factors, were played in most kindergartens. By providing in-depth studies of children playing computer games, the project aimed at offering insight into the children`s experiences during game play as well as how the pre-school teachers were involved in these practices. The first part of the empirical study showed me that the pre-school teacher most often was absent or distal when the children were playing computer games. This led to an interest in looking more carefully into

the didactic challenges the pre-school teacher encounters when computer games are implemented in kindergartens and resulted in the launching of the concept of *didactic dissonance* as a tool for discussing the challenges that occur when the different discourses of the student, the teacher and the medium are in conflict with each other.

Figure 3. Article II - Didactic Challenges When Computer Games Are Implemented in Kindergartens; Tensions Between Different Discourses



Didactic dissonance thus became the title of the last part of the empirical study investigating more thoroughly the different roles (see Figure 4) the pre-school teacher chooses when implementing the games in didactic contexts.

Figure 4. Article III – Didactic Dissonance; Different Teacher Roles Pre-School Teachers Maneuver Between When Children Play Computer Games

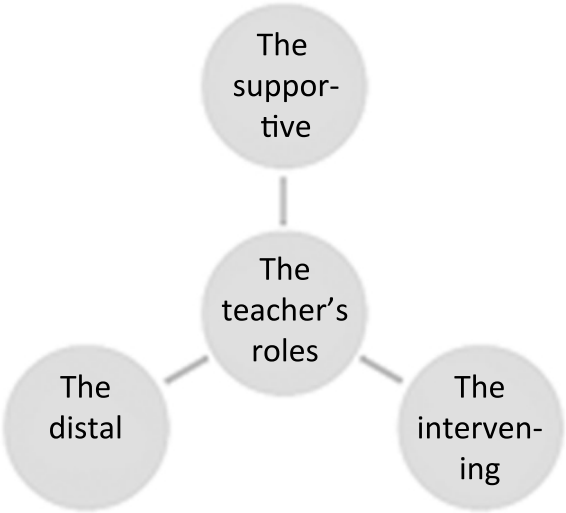
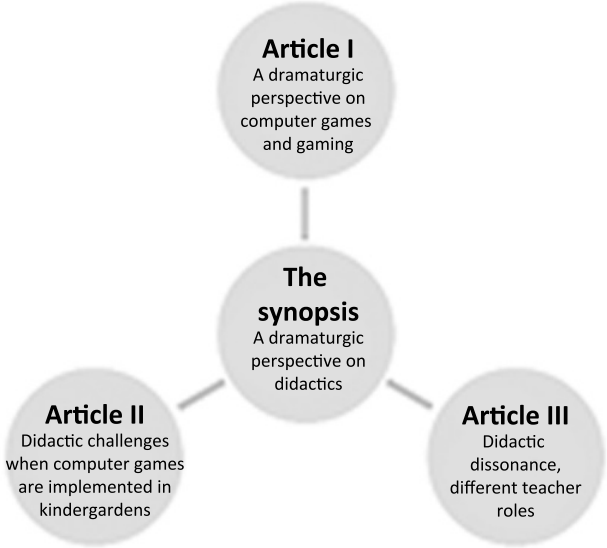


Figure 5. The Coherence Between the Papers and the Synopsis



I categorise my contribution to the field as poetics because it offers a theory that might be capable of speaking to the developers of games as well as to the teachers that take educational computer games into their kindergartens or classrooms. Hopefully, this can

contribute to the thinking about the design of computer games in terms of providing a stand-off critical perspective for producers, for teacher training, for the educational authorities that decide about educational content and form, and for educators themselves.

As a short introduction, Table 1 presents the methodological solutions of the three studies and the three articles they are reported in.

Table 1. Overview of the Three Articles

Aim of research	The aim of the study is to gain knowledge about educational computer games and its implementation in an educational context.		
Research question	How can we interpret, understand and analyse educational computer games as a medium featured by its sociological and cultural context? How do the teacher, child and medium interact when this medium is implemented in educational contexts? What will be central didactic implications?		
	Article I	**Article II**	**Article III**
Aim of the study	To study contemporary humanistic research on computer games and gaming and look more carefully into how dramaturgy can contribute to the analysis and understanding of computer games	To focus on what happens when the educational computer game is implemented in kindergartens and how this challenges the educator`s didactics	To focus on the didactic dissonance and the different teacher roles the pre-school teachers maneuver between when the children play computer games
Specification of the research question	How can dramaturgy be a supplementary theoretical tool for analysing computer games and their learning potential?	What didactic challenges does the pre-school teacher face when commercial educational computer games are implemented in kindergartens?	How does the pre-school teacher respond to the didactic dissonance that arises when educational computer games are used in kindergartens?
Title of paper	A dramaturgic perspective: seeing digital role-plays as drama and theatre. What are the epistemological and pedagogical consequences?	Computer games in pre-school settings: Didactical challenges when commercial educational computer games are implemented in kindergartens	Didactic dissonance: Teacher roles in computer gaming situations in kindergartens
Data collection, material	A study of research on digital games: Theories on ludology, narratology and dramaturgy.	Video-observations of children playing computer games in 4 kindergartens. Typical games used in kindergartens. Theories from study and Article I in addition to didactics. Nationwide survey as a back-drop. Loops with video, field-notes and semi-structured interviews with 8 pre-school teachers, 2 from each kindergarten. Policy document.	The same as for Article II.
Analytical concepts / data analysis	A hermeneutic approach. Research analysis, theoretical analysis	A dramaturgic hermeneutic approach of verbal utterances and bodily actions in space and time and related to didactics. The video observations and interviews were transcribed with help from the program “Hyper Transcribe” and were analysed with help from dramaturgic and didactic theories, models and tools. A microanalysis of one particular computer gaming situation was conducted where the teacher tries to be a co-player as well as trying to involve the gamers in a meta-perspective on the gaming.	A hermeneutic dramaturgic approach of verbal utterances and bodily actions in space and time and related to didactics. Several microanalysis based on different gaming situations as well as analysis of field-notes.
Findings	My findings from sub-study I indicate the importance of viewing the game as a holistic and artistic whole and as a dramaturgic multi-faceted performance that communicate with its recipients in an interactive dynamic way	One of the main findings in sub-study II is that there in the gaming situation arises a conflict between three discourses: 1) the game's discourse, 2) the teacher`s discourse and 3) the child's discourse, also understood as a conflict between two pedagogical voices struggling for the child`s attention: the teacher`s didactics built on social constructivist theories and the game's didactics based on a behaviourist pedagogical foundation.	One main-finding in sub-study III is that the pre-school teacher’s function in computer gaming situations can be viewed in a continuum. On one extreme is the teacher who takes an intervening role, and on the other extreme is the teacher who chooses to restrict herself/himself to an organizing or distal role. An intermediate position, in which the teacher is a contributor and encouraging bystander, is an alternative role.

2. Theoretical foundation

Dramaturgy is usually seen as being courses of action and the building blocks of how to construct/compose a piece of theatre/film or how to analyse theatre/film, the so called dramaturgic analysis, or how the theatre/film influences the spectator/audience, the reception analysis, or how the meeting/interaction between stage and spectator occurs and develops, the interaction analysis. Dramaturgy gives the performance a structure as well as it can be used to analyse a performance.

I have focused on the traditional dramaturgic theories and placed emphasize on interactive dramaturgy, since I see interactivity as being a core premise of the gaming process or the game play.

When interactivity became part of the one-way orientated media, mass communication was transformed into participatory media, something that advantageously can be examined with dramaturgical optics.

2.1 Media

Computer games are fundamentally technology and media. Given this, we cannot solely use methods developed for evaluating and understanding technology; game research must also investigate the media as such. Digital technologies, in general, and computer games, in particular, invite research to focus studies on examining the form of the medium itself and what communicative practises the medium invites.

The Danish media researcher Klaus Bruhn Jensen makes a distinction between three general types of media, or media of three degrees: a) the human body enabling communication face to face, b) the technically reproduced means of analogue mass communication and c) the digital technologies facilitating one-to-one, one-to-many and many-to-many networked interaction (Bruhn Jensen, 2010). All three media degrees share some basic features; communicators take turns, and they make transitions to action, whether of a consensual or conflictive nature (ibid). Turn taking is obvious in face-to-face communication but applies

more generally to communicative practices in other media such as returning to the same media over and over again or in comparing one media to another.

> In computer-mediated communication as in conversation, turn-taking depends on its purpose and context – what the turns are about and why they are taken. Different genres involve different structures of turn-taking. (Bruhn Jensen, 2010, p. 101)

Digital media facilitate interaction with other communicators as well as with the interfaces and systems of communication. Computer games are digital media and thus examples of media of the third degree. Computer games are media that invite engagement and social exchange through interactivity and personalization. When we play we are constantly giving and taking feedback. This perspective on games is in line with Kjetil Sandvik`s dramaturgic model, in which he suggests classifying computer games as being represented in and by an *interactive dramaturgy*.

Bruhn Jensen points out, referring to media of the first degree, that human beings can be understood as media, hosting speech, song, dance, drama and other creative capacities that can be cultivated into competences by children as well as professionals. In itself, the human body is a necessary and sufficient material condition of communication. He goes on to describe tools such as writing utensils and musical instruments to be neither necessary nor sufficient, but that they extend the human body and its communicative capacities.

> Media of the first degree – human bodies and their extensions in tools – externalize accounts of actual as well as possible worlds and enable each of us to communicate with others about such worlds for both reflective and instrumental purposes. (Bruhn Jensen, p. 66)

Following this theoretical perspective, this doctoral thesis has put media in the centre of the *extended didactic triangle* (Vangsnes, Økland, & Krumsvik, 2012) (see Figure 1) in order to show that the medium can be the material media of three degrees, in this project exemplified by the game per se (third degree – Article I), the educational game (third degree – Article II and III) and the everyday conversation (first degree – Article II and III).

People can do particular things with particular media (Katz, 1959), and particular media constitute a unique set of resources extending the human body in diverse contexts of action. Didactically, this means that different media invite and constitute different practices.

Partaking in a face-to-face dialogue, reading a book or playing in the sandbox are examples of media that require different communicative and interactive structures than computer gaming, for instance. This means that different forms of expressions afford different contents of experience and of social interaction. Meanings emerge in the meeting of form and content – in the discourses, genres, and modalities of communication (Bruhn Jensen, 2010, p. 84). Media thus put phenomena in form, and it informs the world in a way that stimulates the recipient to construct meaning, as Qvortrup (2007) puts it. Form (media), content, teacher and child thus constitute the three cornerstones (in addition to the medium) in my extended didactic triangle, and these elements are all central in my didactic model (see Figure 8). Inspired by Qvortrup, I do not consider media to be some kind of transmission where meaning and knowledge is transported into the mind of the receivers; however, the basic function of media is to transform millions of inputs into a manageable number of signs and concepts in order to construct a distinction between the external world and the cognition of the world (Qvortrup, 2007, p. 20). A medium is always a medium in relation to a form for which it is a medium, and correspondingly, form is always form in relation to a medium (ibid, p. 28).

One main feature characterizing computer games is that they are interactive and invite gamers to communicate in its genre-specific way. Bruhn Jensen points out that every medium remediates – reproduces as well as reconfigures – the basic modalities of human communication: speech, song, writing, and still and moving images (ibid).

This is in line with Dewey and his view upon aesthetic praxis: “Because objects of art are expressive, they are a language. Rather they are many languages. For each art has its own medium, and that medium is especially fitted for one kind of communication” (Dewey, 2005, p. 106).

There is an ongoing debate about whether a computer game can be recognized as an autonomous art object, even though most scholars today would agree that it is. The discussion is more about if it is to be valued as an art object of high or low value. Because in both public and professional opinions it is not seen as representing much value in itself, the computer game is brought into educational contexts when the game represents content that is present in the curriculum. Because of this, we can find computer games in schools with titles like *Global Conflict; Palestine*, *the Vikings* and *The Plague*, and in kindergartens, we find

spin-off games built on popular and highly recommended children`s books. Many of these games are often recognized to be of higher educational value than the games labelled “play and learn” games, which are the games I have analysed in use. When it comes to children`s books, we will of course find many examples of literature used in kindergartens and schools where the content alone is of low interest because the novel or the poem is considered to be an autonomous piece of art, but the form is a criterion in itself. I take into consideration a computer game can be seen as an object of art with value in its own genre and characteristics, and it can possess content appropriate for the group of students who are going to play the game as part of their learning and building process (gaming literacy), but this is not a central discussion in this thesis.

2.2 Dramaturgy and didactics

The theory of dramaturgy most often reflects the way in which a drama[3] is built or constructed. The word *dramaturgy* derives from the Greek words *dramatourgos*, *drama* and *ourgos* (dramaturge, action and work). Drama means action, and dramaturgy in this context means *to create action*. It was Gotthold Ephraim Lessing (1729–1781) who introduced the concept through his *Hamburgische Dramaturgie* (1952), and dramaturgy, even at that time, meant reflections over the nature and effect of drama. Following Lessing, dramaturgy appeared to be an academic subject describing the poetics of theatre, and dramaturgy has since been theorizing the nature and effect of performative expressions and thus contributing to poetic reflections.

The term has been connected to a) what actually happens in the creative process and can be understood as a description of the relation between the creators of the drama, or the product itself (be it print, theatrical or film,) and the audience; b) the structure and effect of the play`s theme, plot and character that moves through time and space toward goals and conflicts; and c) the study of theatrical tools and elements and how they work together in a performance. Eugenio Barba defined dramaturgy as *actions at work*, meaning that any stage action is available for mounting, be it gestures, text fragments, movements or arrangements,

[3] This can refer to both theatre and film and other performative expressions.

in other words, anything that can be at the centre of the audience`s attention. Barba uses the term montage, originally used in 1920s art experiments, and tends to describe montage as synonymous with dramaturgy (Barba & Savarese, 1991; Gladsø, Gjervan, Hovik, & Skagen, 2005). In line with Lehmann (2006) and his post-dramatic theatre, I pay attention to theatre as performance instead of theatre as literature or text. This means that I view the game as a performance more than as a text, which is the reason why dramaturgy instead of semiotics is a relevant theoretical perspective.

The turn to performance theory is testament to a new emphasis on performance theatre and art forms such as happenings and live art, emerging from the 1960s onwards. This resulted in renewed attention to the materiality of performance and renewed criticism of the dominance of text (Lehmann, 2006, p. 4).

Taking a dramaturgic approach means that I work to understand how dramaturgy can interpret and explain something about computer games, being one form of performative expression. This perspective will in turn, as well, say something about interactivity, attention, motivation, living through and finally something about how this activity creates meaning to the participants through their participation (Bourdieu, 1993) and thus why people learn when they play. This is dramaturgy that combines the a, b and c definitions because my work is guided by all three theoretical and analytic foci: a) the relation/interactivity between game and gamer, b) the study about the game`s structure and effect and finally, c) the study of the game`s dramaturgic tools and elements. How do the games follow a theatrical formula in order to enhance the meaning of the participants' experience by using the theatrical elements of tension, focus, contrast and symbolization and what happens when children go into the fictional world and take the role of the avatar?

According to traditional theories about theatre, there will always be an element of *as if* in the representation. *Being "as if" is the self's fictional mode of operation* (Courtney, 1990; 1995). This operation takes place in different spheres of life, although it is particularly noticeable in expressions where role-taking plays an important part. *We imagine, and thereby think of possibilities. When we take one of these possibilities and externalize it in action, we try to make creative ideas (hypotheses and models) work in the world* (ibid). We try to act as someone else.

> In any world of "as if" there are two types of transformation. First, people think "as if" (or think and act "as if") they are different from their everyday selves. They transform themselves into another." . . . Second, "as if" acts transform what we know. Transformation of the persona gives us a new perspective on an event: we learn more about it and this changes our knowledge of it. (Courtney, 1990, p. 14)

This can be said to be hermeneutics for practical trial and error. Dramaturgy has also been used to describe social interactions in everyday lives (Goffman, 1992). In his most famous book, *The Presentation of Self in Everyday Life*, he analyses the context of human behaviour instead of the causes, and he says that a person`s identity is constantly remade as the person interacts with others.

Theatricality derives from the Greek *theatron*. The etymological meaning of *theatron* denotes the means through which viewing (*thea*) is achieved and thus means a place for viewing. Most theatre researchers consequently base their definitions some way or the other on the spectator´s role and position. Thomas Rosendal Nielsen (2011) therefore sees theatricality as a form of perception and claims that the spectator has a role in an interactivity system: the role of the perceivable perceiver (p. 67). This means a role that includes experiences of one`s own and others` actions. Josette Feral (2002) also noted that theatricality is a perceptive as well as cognitive phenomenon "since the theatrical phenomenon is acknowledged and rendered operational by the spectator`s presence alone" (Féral, 2002, p. 3).

She stresses that the spectator's gaze is a combination of a process of perception and a process of recognition. This double perspective[4] is a communicative modality of perceptions that can take place in a theatre room as well as in our everyday role-playing (Goffman, 1992). It can be seen in the mutual relationship between the auditorium and the stage and between the role and the person. The difference is that in the theatre, everybody is aware that what you perceive is fiction, the audience knows that what you watch on stage are figures that pretend and play as if they are someone else, even though postmodern theatre forms like to challenge this concept and normative theatre practices has systematically been re-examined. Taking different roles in everyday role-plays (Goffman, 1992) do not involve this

[4] Artaud: The Theatre and its Double.

kind of fiction and theatricality. It is in other words and from my point of view a difference between theatricality and staging because staging does not have reference to aesthetic doubling in the same way. Due to this interpretation, I use staging with reference to how the pre-school teacher choose and presents the content and media in a pre-school context, but I use theatrical concepts such as fiction and action, showing that it is created and formed, to describe the computer game.

I want to use dramaturgy to examine the social interactions that take place in kindergartens when children play computer games, but my approach is somewhat different to Goffman's. Instead, I think of kindergartens as organizations containing praxises that can be characterized as performances. There are actors or participants who take part in different stagings; the participants give directions to the daily work, and they create topics, focus and find and use media in order to explore themes and plots. Dramaturgy refers to what creates life, how it is structured, what drives the action forward, how the roles and actions are connected, and what it is that creates and regulates elements such as tension, rhythm, contrast and symbolization. By introducing *a dramaturgic didactic model* (see Chapter 5.4), the focus is moved away from just looking at the relationship/interactivity between game and gamer to incorporating the educator in the social context of gaming; in other words, the focus is directed towards the educators` didactic orchestration and staging of the medium in the context of kindergartens.

> Didactics seek models of teacher thinking – seen in terms of the quality and character of the rationales which they yield and which teachers, in their turn, can use to thoughtfully justify their teaching in terms of both its contribution to *Bildung* and the mandates of the *Lehrplan.* (Westbury, 2002, p. 48)

2.3 Interactivity versus interaction

Interactivity has become a term with many positive connotations. Being a medium with high interactivity is often highly valued and considered to be more democratic and to possess more influence than media with lower levels of interactivity where the medium holds few opportunities for choice. Thomas Rosendal Nielsen says that the poetics about interactive dramaturgies argues for their social value, their empowerment of the participant, the

participants´ possession of agency, and their production of authentic experiences and enchantment (2011). However, many researchers are today, in light of all the new technologies and media that claim to be interactive, sceptical of the positive expectations. Lev Manovich has called it *The Myth of Interactivity* (Manovich, 2001, p. 55), arguing that the choices are limited; the selection is from a pre-programmed range of options and only give a semblance of democratic choices. From an Aristotelian dramaturgic position, Brenda Laurel has described the significance of the choices in *Computers as Theatre*:

> Interactivity exists on a continuum that could be characterized by three variables: frequency (how often you could interact), range (how many choices were available), and significance (how much choices really affected matters). (Laurel, 1993, p. 20)

In this way, Laurel draws attention to user-oriented access to interactivity. From this doctoral thesis` point of view, I am more interested in *how* the interactivity takes place than *how much* interactivity there is; this applies to both the interactivity between the game and gamer as well as the social interaction between teacher and child/children.

However, in order to understand the way I have used interactivity in this dissertation, I need to take a detour to examine the relationship between interactivity and interaction. The distinction between *interactivity* and *interaction* is suggested to be an analogy between human–machine and human–human. The idea of interactivity derives from the sociological concept of interaction between humans (Goffman, 1992), which includes alternation and participation.

> When interactivity enters the otherwise often unidirectional-oriented media, mass communication is changed into participatory media, which can advantageously be understood with a dramaturgical optics. (Christoffersen, Falk, Rosendal Nielsen, & Koefoed Hansen, 2009, p. 4) (my translation)

Bruhn Jensen points out that the term has been imported into media and communication research from the sociological concept of interaction between human agents, face to face (Bruhn Jensen, 2010, p. 53). He says that the terminology has been ambiguous because the field has aimed to account both for people´s interactivity with media and for their interaction with each other through media (ibid, p. 54).

Interactivity with media anticipates interactions between people. Even though interactivity and interaction are interwoven in each other in many ways, I have been inspired, especially in Article II and III, by Jens F. Jensen, who made a distinction between the two. Jensen makes a distinction between interaction as a sociological concept and interactivity as a media/scientific concept. I follow Jensen in order to exemplify the difference between the turn taking and communication that takes place when selecting from a pre-programmed range of options in computer gaming (interactivity) and the sociological face-to-face communication that takes place between human beings in their everyday dialogue (interaction). Both represent communication, and the media human actors have at their disposal will influence the way they interact and communicate together and through the media.

3. Methodology and methods

In this chapter, I present and discuss the ontology, epistemology and methodology of my doctoral thesis. I start out by describing the philosophy of science that has influenced my work and the epistemic approach and how knowledge is attained and built up related to these theories. This part includes some paragraphs about hermeneutics and ethnography. I continue by describing the research design of my study– in more depth than in the articles – and I describe my methods, instruments and processes linked to the data collection of the three articles. The third section elaborates on the principles of analysis and contains a description of the quality of the data. The chapter is concluded by reflections on trustworthiness and ethics.

3.1 Ontology and epistemology

Ontology – meaning the philosophical nature of being, the exploration of existence and reality, or how we categorize and define the relations between objects – has formed my interest in the essential ontological dichotomy between the particular and the universal. My particular object is the educational computer game, and my aim is to say something about what these particular games have in common, namely the universal characteristics or qualities of the object studied, and the didactic context where the game is taken into practice. Wittgenstein`s philosophical idea about family resemblance helps me understand the common features of this group of games that are connected by a series of overlapping similarities, even though no one feature is common to all.

> I can think of no better expression to characterize these similarities than *family resemblances*; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way. And I shall say: 'games' form a family. (Wittgenstein, 2010, p. 67)

Game play is complex and multimodal, and gaming practices are equally diverse in form and nature. Still, there are some common essential elements that are shared which make it possible to recognize and classify these particular games and their didactic use.

> [There] must be something common, or they would not be called “games” – but look and see whether there is anything common to all. For if you look at them you will not see something that is common to all, but similarities, relationships, and a whole series of them at that. To repeat: don't think, but look! And the result of this examination is: we see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities. (Wittgenstein, 2010, p. 66)

The notion of family resemblance can be used as well to interpret didactics because all didactic situations share some common features, but no one feature is found in all didactic situations. This perspective has similarities with the pair of concepts, particular and universal. *Particular* derives from the Latin word *particula*, which means an individual or distinct part or an individual or specific group within a general class. *Universal* derives from *universalis*, meaning all together, whole, entire or belonging to all. The specific game can be seen as a particular representing the universal notion of a game, and the didactic gaming situation can be seen as a particular representing something universal and common in all didactic gaming situations. Because of this, it makes it possible to generalize even from a limited set of data. However, if we study some single particularities, on what basis can we say that the research also applies to similar cases or even say something about the universality of the phenomenon? In academia, this debate is reflected in the contrasting epistemologies of positivism and hermeneutics or interpretivism, where the former represents the view that knowledge should ideally be expressed in terms of generalisable laws, regardless of cultural context. On the contrary, hermeneutics generally focus on complex processes of culture and cultural objects and phenomena as they occur in context. According to Gadamer (2006), the researcher is formed by contemporary society and will consequently approach the examined field and interpret from this horizon of understanding. In most cases, the research object is established under the influence of other ideas and relationships and thus characterized by a different horizon. Between these two horizons of understanding, a hermeneutic circle is established as one understands *the other* from one´s own position and as one modifies one´s own position because of the interpretation of *the other*. Through this dialogical meeting with the object, interpreters have to be aware of their own prejudices and pre-understanding (for further details, see next chapter).

How game-play practice and activities are situated in a didactic context is the dominant approach in this doctoral thesis. According to Wittgenstein, meaning is to be found in the way words and sentences are used in a language game, regulated by rules that evolve and develop in certain cultures. “We don’t start from words, but from certain occasions or activities” (Wittgenstein, 1970). In line with this, I wanted to study computer gaming in a didactic context, assuming that doing so could supply me with a richer understanding of the phenomenon and its didactic use.

There has been a merger between social sciences and theatre studies over the last few decades, often associated with Richard Schechner, who has highlighted the integration of theatre with social and cultural processes. Examples can be found in many disciplines. For instance, researchers have examined how newer media such as virtual environments are creating new forms and thus reconfiguring the terms of theatricality. Erwin Goffman sees theatre in all spheres of human life, and in *The Presentation of Self in Everyday Life*, he describes the way human beings act and play their different roles in order to constitute institutions and society. The social role-play is viewed to be a process which constitutes society and shapes its form (Kjølner, 2011). Janek Szatkowski (2011) says that another relevant sociological description of the distinction between the person and role can be found in Niklas Luhmann`s *Social Systems* from 1984. Here, the role is also described as something that is distinguished from the person. Behind the role, we find a program, and behind the program, we find some values. The role is in one way related to the goals of the actual role but can also only represent a part of the person`s behaviour. The role is thus related to the individual but also to the fact that the role can be performed by many and by replaceable others, such as teacher roles (Luhmann, 2000). We can thus expect certain behaviour from those who perform the role. An example of this is found in my research and presented in Article III. So what is the program that governs the role and its behaviour? A program is, in Luhmann`s terminology, a collection of stated and unspoken rules that regulate the goals and conditions for the role. The values are constituted in the preferences when choosing between alternatives (Szatkowski, 2011). Szatkowski says that it is important to be able to distinguish between interaction and communication and calls it a theatre *for* and a theatre *with* an audience, and by *with*, he means when the actors radically invites the audience to become an active part of the performance. Computer gaming might be labelled as theatre with an audience.

Epistemological perspectives in education are sometimes criticized for having too much focus on goals instead of means and for being instrumental (Matusov, 2009; Sidorkin, 1999). On the contrary, ontology emphasizes how knowledge and meaning is constructed and seeks adequate ways to transform this knowledge into the educational context. Matusov`s perspective is that education itself is dialogic because the process of creating meaning is dialogic (Dysthe, Bernhardt, & Esbjørn, 2013).

Instead of turning to newer theory constructions, such as multimodality (Kress, 2010), it is my opinion that theatre studies already possess a basic vocabulary suitable for analysing and researching art as an experience (Dewey, 2005) and thus practices of communication. An art experience, according to Gadamer (2006) and Dewey, is defined as bodily and conceptual, and the feeling of rhythm is essential in experiencing art. Dewey emphasizes the practical as well as the emotional and intellectual character of the experience. The artwork, for instance, is a process more than an object, a process where the recipient contributes in the meaning-making process (Dewey, 2005).

> Dewey's transactional understanding of experience provides a framework in which knowing is no longer about an immaterial mind looking at the material world and registering what goes on in it – a view to which Dewey referred as the spectator theory of knowledge. For him, knowing is not about a world ''out there", but concerns the relation between our actions and their consequences – which is the central idea of Dewey's transactional theory of knowing. (Biesta, 2010a, p. 503)

We could say that we have gained knowledge, as long as we do not forget that this is not knowledge about the *world,* but about the relations between our actions and their consequences in this particular situation (ibid).
A constructivist epistemologist such as Luhmann divides human life into operative systems. A theatre production belongs for instance to the category of social interaction systems because the participants are present in the same room and perceive and act together. The individual`s thoughts, emotions and imaginations represent the psychological system. The action/event or the situational meeting is thus central in communication (Kneer & Nassehi, 1997). The situated body has a central position in the action/event, and the body is part of the communicative process (Aune, 2013). By putting the event in the centre of communication, it opens the room for the spontaneous, immediate and qualitative aspects of

being together. Aune says this is important when we are examining phenomena that include performativity and experiences in being both spectator and performer in improvised situations (ibid). I share this action/event view when it comes to interpreting both the game itself as well as the social context between game, child and educator.

In *Art as a social system*, Luhman describes how the imaginary world constitutes itself by excluding the real world in social time and room: "In the imaginary world, the medium/form structure of space and time replicates itself together with its unique unfolding of contingence and necessity" (Luhmann, 2000b, p. 113).

Many researchers would say that play is the essence of games as a medium; that is, it presents the player with a series of challenges and opportunities for exploration that provide enhancing and/or desirable experiences (Scacchi, 2012). It is this property of deeply engaged interaction with an underlying simulation that makes games and other forms of interactive computational media powerful, expressive and unique (Mateas, 2001).

Other researchers will rather focus on the game as a powerful storytelling medium. Aspects of story appear in game play both explicitly and implicitly, explicitly when players engage in an unfolding story as a central means of game progression, and implicitly when narrative techniques are used to design character behaviour, cinematic cut-scenes or background music that provide subtle cues to players about the game dynamic (Scacchi, 2012). Harris and Young (2009) underline that the narrative in games combines the cathartic pleasures and reflection on the human condition of well-formed stories, with the exploratory power of a high-agency experience of interaction.

I want to emphasize that an educational computer game, by its nature, is an interactive performance materialized in a playable computational medium, where A (the gamer) performs/acts stories or fragments of stories alone or with others in a certain room and time by operating B (the avatar) in a room and with time alone or with others in order for A (the gamer) to be entertained and educated. B (the avatar) is operated as an actant in the narrative by the gamer (A) who thus, in a way, plays the avatar. The gamer is both playing the role as the avatar at the same time as he or she is the audience to what appears on the screen. This double optics exemplifies the interactivity and the movement from theatre *for* an audience to theatre *with* an audience (Szatkowski, 2006).

3.2 Hermeneutics and ethnography

Hermeneutics cannot from my point of view be reduced to a methodological question. It is rather understood to be a philosophical epistemology. The aim is to try to understand the singular cases by using the hermeneutic circle.

Gadamer emphasizes that the movement of understanding goes from part to whole and from the whole to the parts and that the task is through circles to expand the understanding: “Thus the movement of understanding is constantly from the whole to the part and back to the whole. Our task is to expand the unity of the understood meaning centrifugally” (Gadamer, 2006, p. 291).

Gadamer characterizes the hermeneutic circle in this way: *The circle of understanding is not a ”methodological” circle, but describes an element of the ontological structure of understanding* (Gadamer, 2006, p. 293). The hermeneutic circle functions as a model for my doctoral thesis, being a superstructure that represents a way to understand my methodology and analysis. This means that I understand my interpretation in light of a hermeneutic circle or spiral, where each scene of the game can only be understood as being part of a whole, and the whole (game) can only be understood as consisting of its parts. Likewise, the didactic gaming situation consists of smaller scenes or sequences that can only be analysed, interpreted and understood as parts of a whole, and the whole can only be understood as being constituted by its parts.

Figure 6. The Use of the Hermeneutic Circle Within the Different Chapters

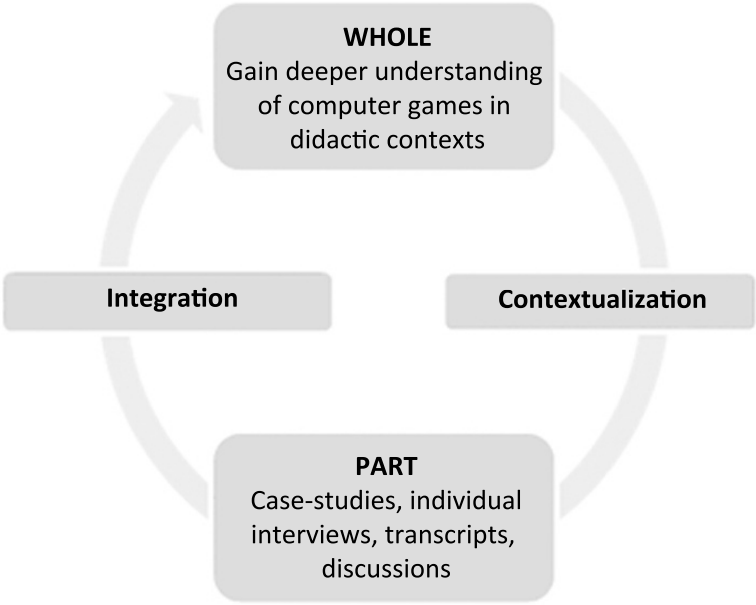


Figure 6. Adapted from Paterson & Higgs (2005).

My overall research perspective is embedded in hermeneutics and a belief in hermeneutics as constituting a philosophical way of understanding phenomena and human interaction. In line with Gadamer (Gadamer, 2006), I believe that people have a historically effected consciousness and that we are embedded in the historical and cultural context through which our world view is shaped. Thus, interpreting something involves a fusion of horizons, meaning that the researcher adapts the phenomenon to their own background, and as a movement of understanding, we recognize the authority of an object or phenomenon by entering into a dialogue with the past. In this perspective, the researcher's subject consciousness of historical content is vital.

The researcher is shaped by contemporaries, and out of this horizon of understanding, one approaches what is to be investigated and interpreted. The research object was formed under the influence of other ideas and relationships and thus characterized by a different horizon. Between these two horizons of understanding, a hermeneutical circle is established in understanding the strange notions in light of a consistent perspective, but it modifies the understanding of the situation at the same time on the basis of interpretation of the promotional. Gadamer says that when one has realized that the absolute objective is

unattainable, the approximate objectivity comes forward, and that one through self-reflection is conscious of one`s own horizon of understanding (or prejudices as Gadamer calls it). Gadamer's attempt to build a critical element of interpretation is related to an attempt to be aware of, through a dialogical encounter with the text, the pre-understanding or prejudices that can destroy our understanding of the text. This means that I do not look at educational research as presenting a transcendent truth, but rather as a particular representation or interpretation of reality grounded in the empirical world. In line with Blumer (1969), this means that human experience is mediated by interpretation.

My study draws from an interdisciplinary methodological frame that combines a hermeneutic approach with phenomenology and ethnography when studying the medium of computer games and its implementation in Norwegian kindergartens. One important role of ethnography is to make everyday activities visible and throw light at different perspectives that otherwise are difficult to access. Norman Denzin (1997, 2001) says that the way we as researchers can approach the field is by interpretive ethnography, and he emphasizes the interpreter and the interpretations as particularly significant. “Viewing culture as a complex performative process, it (interpretive ethnography) seeks to understand how people enact and construct meaning in their daily lives” (Denzin, 2001 p. 20).

The understanding we seek is based on observations of social and mediated events and the participants` dissemination of experiences, episodes and reflections. Denzin describes the participants as co-producers, and he stresses the researcher`s responsibility to be self-reflective and self-critical, as well as the importance of following theoretical perspectives.

My media in didactics study partly draws on an ethnographic approach that describes how game structure and game dramaturgy influence the everyday context of gaming in kindergartens. Gaming can best be understood when it is observed in the setting in which it occurs. Thus, in part two and three of my study, the method of fieldwork has been carried out as a case study, combining and collecting descriptive data through video observations, field notes and interviews. Even though ethnographic studies may include analysing everything from interviews to mass media, participant observation is one of the cornerstones of ethnography (Boellstorff, Nardi, Pearce, & Taylor, 2012).

> If a methodological toolbox does not include participant observation, the approach may be legitimate and effective for exploring any number of topics, but it is not ethnographic. (Boellstorff, Nardi, Pearce, & Taylor, 2012, p. 65)

The first part of my dissertation, which is a theoretical study, does not include participant observation and can therefore not be called an ethnographic study. This part, as well as my whole study, is grounded in a phenomenologic and hermeneutic approach where phenomenology refers to notions of subjectivity and multiple interpretations. My analysis of theories about computer games in general and role-playing games in particular are rooted in a phenomenological hermeneutic tradition where I interpret the games` characteristics as well as the dialectic structure that occurs between game and gamer. This means that I am particularly interested in trying to understand the medium itself and how it communicates and creates meaning in the interactive process with its recipients. Modernist theories emphasized that objects of art possess an intrinsic significance or essence that can be decoded if the receiver holds the right knowledge and tools. From a modernist point of view, both the individual and the object of art consist of a solid inner core or identity that can be expressed in or through a form. The object of art particularly makes references to itself and to the relationship between object and creator. This can be called a closed form because it contains an understanding of the subject`s identity as an inner core that expresses itself through a representative form (Illeris, 2009)[5].

Holding a performative perspective is developed as part of post-modernism. In light of this theory, form is understood as actions and opportunities for action, and there is a shift of focus from the object itself to the receiver or audience. The object/medium itself has no value in itself; meaning is created when someone watches/reads/plays it. This is a more open form that focuses on reception and the possibilities for creation and recreation of meaning. From my perspective, computer games represent a type of media that is explicitly suited to be analysed and understood by performative and theatrical theories because of the games' significant action–reaction way of communicating with the recipients. The game has no value until it is played, and every time it is played, new meaning is created. Consequently, the experience is productive as well as receptive. The terms *performativity* and *theatricality*

[5] Illeris is inspired by the American gender researcher Judith Butler.

are discussed among scholars (Kjølner, 2011) in terms of what the concepts mean and whether they mean the same thing. A common distinction is made as to whether fiction is included or not, but performance, theatricality and dramaturgy, are ways to operationalise theatricality. They have become popular frames for discussing cultural and social meaning construction. In this doctoral thesis, I use dramaturgy to express myself in constituting my theoretical and analytical platform.

3.3 Research design

3.3.1 Data collection

In order to answer my research questions and contribute to a fuller understanding of the studied topic, it was important to collect data from more than one source of information. It was important to choose data collection methods that matched the research questions in order to address any plausible validity threats to the answers (Maxwell, 2005, p. 93). All specific data was chosen, collected and analysed by at least two researchers, and the backdrop data instruments, such as the survey, were conducted by the whole research group consisting of three males and three females.

The particular data collected in Sub-Study I were theories on computer games and computer gaming. Sub-Study II and III consist of data collected from video observations and field notes taken in four different kindergartens and interviews with eight pre-school teachers and the data found in educational games used in our research kindergartens. The game most frequently used during our observation period represents this particular data source. As a backdrop, I used data from the national survey (Kvinge et al. 2010) and Norwegian official policy documents such as relevant white papers. Data were collected in two different periods; the first data collection phase in 2008–2009, investigated theories about computer games and gaming, which again formed my theoretical and analytical positioning. Since early childhood and kindergartens were in focus, it became natural to conduct ethnographic studies of the games in didactic use (by this age group) and in the formal and structured learning context of kindergartens. This was a period of adjustment towards the ethnographic perspective; however, my theoretical and analytical perspectives remained the same. Early in

the process, I decided to do video observations as well as audio recordings of the gaming situations.

3.3.2 Case study

The site was the natural environment of four Norwegian kindergartens. The study takes into account that children are productive actors in the social world (James, Jenks, & Prout, 1998), and the study documents the ways in which children produce meaning when they are playing computer games in kindergartens, but the main emphasis in this study is on the pre-school teacher`s role in the extended didactic triangle.

The kindergartens were chosen by purposeful and criterion sampling (Patton, 1987), each meeting some predetermined criteria of importance. They are all located in the district Stord/Haugesund, which made it possible for the researchers to visit the kindergarten from morning till noon and still be back in the office for rewriting and transcribing. We asked for kindergartens that already used computer games in their daily work and that had computers located in the common room of the kindergarten. We started out by sending a letter to the local authorities in the district of Stord and Haugesund, which again sent a request to all the kindergartens in the district to determine if they wanted to attend the research program.

Ten kindergartens were interested in being part of our research program. Our research team discussed what criteria we wanted to use for picking our sites before we visited each of the kindergartens to find out more about a) what games they used, b) how often they normally played, c) where the computers were located and, last but not least, d) the pre-school teachers` and principles` interest in the topic. For this first meeting with the principles and educators, we had prepared questions that we used as a more or less loose base for our conversation. We decided to choose two kindergartens from each of the two districts, partly because we thought it best that our teacher training college performed the research in both of the districts we are situated in and partly because the two districts represent different populations, different sizes of kindergartens and different cultures, some being more rural than the others. In choosing between the interested kindergartens, we faced another challenge since they had already all met our criteria: they had computer gaming on their agenda, they (the educators) were specifically interested in the topic and they were all located within the two districts. Among other factors we thus selected the four kindergartens

where they seemed to use the games most and where they were playing at the time of day when it would be most appropriate for us to collect our data. When researchers study two or more settings, for instance, they are usually called *multisite studies* (Bogdan & Biklen, 2007), and in line with Bogdan and Biklen, we conducted the additional data collection in order to show generalisability and diversity. One of the reasons for picking the sites therefore came from a wish to find kindergartens that could illustrate a range of settings. Meeting the above criteria, they were all different. And today I know that our findings would have been very different if I only had conducted a single case study. I started developing a loose descriptive theory of computer game didactics that I modified and rewrote throughout the research project. This procedure ensured that a variety of types and subjects were included, but it did not tell anything about the frequency of the particular types included in the study. This research approach is called *modified analytic induction*, and the method of sampling is called *purposeful sampling* (Bogdan & Biklen, 2007).

My version of Strauss and Corbin`s (1994) constant comparative method was as follows: I started collecting the data without having a clear definition or explanation of the phenomenon in use. My internal sampling took place every day I was at the site, but from the time I arrived in the morning until I left (around 12 midday), I studied all the children who were playing and the teachers who were around, instead of selecting some students and teachers to follow. This of course gave me very rich data material to transcribe and analyse and provided me with more than sufficient information on the subject categories. In discussing and writing about the categories I was exploring, I looked for the diversity of the dimensions under the categories. In my attempt to describe and account for the data, I was continually looking for new incidents that could broaden my horizon of understanding the phenomenon. Working with the data, models emerged that helped me understand the social processes that appeared in didactic computer gaming situations. Finally, in focusing on the core categories, I combined sampling, coding, discussing and writing in a series of steps synonymous with the hermeneutic circle. In my analysis, the sampling appears more clearly since I had to choose some of the transcripts at the end in order to highlight our findings. Since the purpose of this study was to understand the dynamics of kindergarten behaviour and the relationships between teachers and students, the research setting at kindergartens was of primary importance. The particular medium used in the educational context was of equal importance in understanding the interactivity between the various parties, but I did not understand the consequences of this fully when I started the field work.

I modified my design and changed and narrowed my study as I learned more about the topic of study. I started out looking at the way children communicate when they play computer games and ended up focusing my research on how the pre-school teacher takes part verbally and physically in the computer gaming settings. This means that my focus was turned from the children to the teacher as being a vital part of the extended didactic triangle.

3.3.3 Video observations

Doing the video recordings, I placed a mirror in front of the children playing and the video camera on a tripod behind the children playing. From behind, I thus was able to see the game on the screen, and at the same time I could see the faces of the child/children playing in the mirror. The reason I also used an audio recorder was that I learned in my pre-study that it was sometimes hard to hear what the children said; the audio-recorded data definitely helped me hear the children`s and the practitioners` utterances in a better way.

Considering the costs of observations, several factors required consideration, including how observations were structured. Placing a live observer in the kindergarten setting is the single largest cost. Considering this, I visited each of the kindergartens twice before the actual observations started. My purpose was to get to know the children and the kindergartens and for them to get to know me.

3.3.4 Field notes

During my visits to the kindergartens, I took field notes describing my observations of the activities, dialogues and interactions around the computer and the game play as well as field notes related to the interviews. In the beginning, these field notes were more like a personal log that helped me keep track of the development of the project and to visualize how my research plan was affected by the data collected (Bogdan & Biklen, 2007, p. 119). Later in the project, the field notes were narrowed in accordance with my sharpened research focus, and in line with Bogdan and Biklen, my notes were both descriptive and reflective. After returning to work each day, I wrote the field notes out on my computer while discussing what we had observed with my fellow researcher in order to reconstruct and reflect on the given circumstances as thoroughly as possible. In addition, I transcribed our video and audio recordings as well as our taped interviews.

3.3.5 Semi-structured interviews

In planning and conducting the qualitative research interviews, I followed Kvale and Brinkman`s (2009) phenomenological approach in the interest of trying to understand the pre-school teachers` perspectives and to describe the world as it appeared to the informants. The interviews were semi-structured in the sense that they were neither a completely open conversation nor a closed questionnaire and were used themes from everyday life were used to attempt to understand the interviewee`s perspective (Kvale & Brinkmann, 2009, p. 47). I made an interview guide (see appendix 5) to ensure that some general information was collected from each of the informants; this provided focus at the same time as it allowed a certain degree of freedom and adaptability in getting the wanted information from the interviewees. I sent the interview guide out to the informants (two practitioners from each kindergarten) beforehand, so they could be able to reflect about the questions before the actual interview. Interviewing was chosen for the current project because it provides the opportunity to generate rich data. The descriptions used by practitioners were considered essential in gaining insight into their perceptions and thoughts about the implementation of computer games and their own professional role in computer gaming situations. The interviews were meant to complete and expand the impressions created through observations and the survey. The interviews were divided into themes: a) attitude concerning computer gaming in this kindergarten, b) reflections concerning language and language learning (this was part of the original topic) c) selection and criteria for games and gaming d) reflections concerning the children`s perspective in the gaming situations and e) didactic perspectives and their own contribution in computer gaming situations. Although it is important to pre-plan the key questions, the interview should also, in line with Kvale and Brinkman, be conversational and include follow-up questions when possible. The interviews were audio-recorded and complemented with written field notes by both interviewers. By systematically recording and documenting the responses, my aim was to seek deeper meaning and understanding, which reflects the view on ontology and epistemology described in Chapter 3.1. and 3.2. In this process, as well as in my research project as a whole, there was a hermeneutic alternation between the whole and the parts, between pre-understanding and understanding in the interpretation of meaning and in the integration between theory and practice (Alvesson & Sköldberg, 2008). The interviews were transcribed and analysed by me and my co-researcher, creating a verbatim text of each interview.

3.4 Principles of Analysis

The dramaturgic analysis invokes the theatrical model as a device, or a tool, to focus attention on the consequences of the actors/performers activities and how they are perceived as well as on the event and how it is structured. Dramaturgy, as a concept, can function as a tool that can help to organize and delimit a process; however, the concept now and then needs to be gradually adjusted while the production process is in progress. To be able to analyse, rewrite and create different dramaturgic concepts is vital for a dramaturge. For didactics, we can say that the educator's repertoire in terms of poetics, philosophies, theories and practical knowledge affects the richness and nuances of the resulting data. This means that interactivity can be analysed from the computer game perspectives of interface, user position, game-play genre, and theatrical form and genre in order to interpret the games and establish and interpret didactics. Perspectives to search for in the analysis can thus be a) whether the form is open or closed, meaning how much possibility there is for the gamer and the student to influence the game and the didactics; b) whether there is room for improvisation or not; c) whether there is an opportunity for taking part in emotional situations that include different perspectives and reflection as well as empathy; and d) whether the form follows a linear structure or offers simultaneous perspectives. The analysis will thus entail examining bodily and verbal expressions, pauses, gestures and interactions, as well as dramatic means, such as the tension, development, composition, sub-text and climax related to a performance and performers situated in time and space.

Sub-Study I consists of an analysis of theories on games and perspectives on learning. In Sub-Studies II and III, I used a microanalysis of gaming situations from my data material. I will now describe Sub-Study III in more detail in order to concretize some of my principles which can be seen in the microanalysis of six gaming situations or scenes from my data material. The situations were chosen because they clearly illustrated the different positions the pre-school teachers might choose when confronted with the didactic challenges of computer gaming.

To answer the research question, I conducted (i) a microanalysis of two gaming situations where the pre-school teacher's intention was to expand the learning potential of the game by being personally involved. In the first scene, the teacher tries to enhance the children's encounter with the game through social interaction and meta-dialogue with the children. In

the second scene, the teacher directs the children in how to play the game. The second analysis (ii) is of two situations from the other end of the continuum where the pre-school teacher merely organizes the activity by scheduling and monitoring the time spent on playing the game, by arranging the space, by establishing the daily routines to ensure cooperation and equitable use of the resources, and by controlling the behind-the-scenes work (Siraj-Blatchford, Sylva, Muttock, Gilden, & Bell, 2002; Siraj-Blatchford & Sylva, 2004). My third group of analysis (iii) is exemplified by one particular kindergarten where the staff invented their own way of organizing computer gaming situations to meet the challenges that teachers, from my point of view, seem to have a tacit knowledge about. This scene exemplifies a prolonged praxis in this particular kindergarten and shows how the teachers participate in the children's computer gaming in a supportive way. I found, however, examples of the supportive teacher role in the other kindergartens as well and have included an analysis of a scene that highlights this teacher role.

In line with Sandvik`s interactive dramaturgy, my analysis concentrates on the interactivity between the participants in the gaming situation: between the game and the gamers, the game and the pre-school teacher, and finally the gamers' interaction with their pre-school teacher. By focusing on the dialogue and regarding language as speech acts (Searle, 1969), I include voice, pause, gesture, posture and positions in our analysis when these elements broaden my understanding of the interaction between the participants in the gaming situation.

3.5 Trustworthiness and ethics

This doctoral thesis is conducted according to Lincoln and Guba`s (1985) notion of trustworthiness, whereby the aim of trustworthiness is to assure that the findings are worth paying attention to. There have been several re-conceptualizations of trustworthiness, and today, credibility, dependability, transparency, transferability, authenticity and contextualisation are central concepts when we talk about trustworthiness and ethics in research. These concepts relate to how qualitative research methods build on subjectivity rather than objectivity and on particulars rather than general laws and universal truths.

The credibility of a study concerns the degree to which the findings are credible interpretations of the data material (Lincoln & Guba, 1985). The use of more than one

researcher, multiple resources and collaborative analytical loops have facilitated triangulation. To strengthen the accuracy and validity, I have combined several qualitative research methods and used respondent validation and quasi-statistics (Maxwell, 2005). The member checking was done during the interview process. In addition, a dialogue seminar was arranged with participants from all the research kindergartens where the preliminary findings were discussed in order to check the authenticity of the work. This allowed some of the participants (the educators) to critically comment on the findings. To further ensure the level of reliability of my results, I watched and read the data many times when moving on the hermeneutic circle from the first analysis to more complex investigations. Consequently, an analytical generalisation was established through triangulation by comparing my observational video data, field notes, semi-structured interviews and documents. In my final analysis of the complete data, I applied a phenomenological hermeneutical approach where dramaturgy and didactics constituted my theoretical and analytical positions. Excerpts, interpretations, theories and analytical approaches have been presented to colleagues at several national and international conferences, which again has given me valuable feedback and strengthened the credibility of my research.

To strengthen the study's internal validity, a national survey (Kvinge et al., 2010) was used as a backdrop for the field notes and observations. To the extent possible, I have situated the ethnographic cases and findings in relation to the quantitative findings from the survey.

Regarding transferability, Lincoln and Guba (1985) described this as the degree to which the findings apply or transfer beyond the boundaries of the particular study to other contexts and/or with other participants. It has been my aim to conduct research that can transfer value to pre-school teachers and other teachers and researchers by providing rich thick descriptions of my theories, methods, data material, analysis and implicational didactic model.

4. Findings

What are my main findings? How do the findings from my three articles complement each other? This chapter chronologically presents the findings from each of the three sub-studies. Important parts of the findings are presented in the three articles, and my ambition here is to piece together the different findings in order to present a more holistic picture of the study as a whole and to explain how this particular study might contribute to the research field.

Three research questions were put forward, and attempts to answer them were made in the three articles:

> *Article I: How can dramaturgy be a supplementary theoretical tool for analysing computer games and their learning potential?*
>
> *Article II: What didactical challenges does the pre-school teacher face when commercial educational computer games are implemented in kindergarten?*
>
> Article III: *How does the pre-school teacher respond to the didactic dissonance that arises when educational computer games are used in kindergartens?*

4.1 Article I

Sub-Study I aimed at looking more carefully into how dramaturgy could contribute to the analysis and understanding of computer games. My findings indicate the importance of viewing the game as a holistic and artistic whole and as a dramaturgic multi-faceted performance that communicates with its recipients in an interactive, dynamic way. Computer games combine different artistic expressions such as pictures in motion, music, speech, graphics, dance and visual arts into a performance that shares many similarities with a theatrical performance *with* an audience more than *for* an audience; the game is a dead object of art without a player. In the description that follows, I outline characteristics of games that have emerged from this research using dramaturgic theories and concepts.

The theoretical framing I used in Article I is taken primarily from the classical Aristotelian dramaturgic model, but it also refers to modern and postmodern thinking. The basic

theatrical elements I used as entries were *figure/role*, *story*/*plot*, *space* and *time*, where I chose to emphasise role/figure and story/plot as central parts of the digital fiction. I have used the theatrical term *fiction*[6] with its meaning of "something made up or invented", as this is not an actual historical incident. Fiction has an "as if" dimension; we pretend something to be so which is not actually so at the time of speaking or writing. Alternatively, one might say we simultaneously hold two worlds in mind.

As part of the digital fiction I took a closer look at the notion of *aesthetic doubling* and *as if* and compared the fiction we find in digital role-plays with dramatic and theatrical fictions. In addition, I examined briefly some dramaturgic models to see what kind of interaction occurs in the meeting point between game and player. Still, it can be said that as long as the Aristotelian dramaturgy remains in its hegemonic position according to the construction and structure, players are manipulated by the pre-programmed simulations. The player is being controlled and entertained by fictions that are, to a certain extent, predetermined, without reflecting on where they come from, who created them and what the purpose is. In contrast to traditional stories, the fictions and simulations open up countless representations where alternative scenarios can be tested. In educational games production, there is a potential to produce games for children that are both pedagogic and entertaining. However, such games will benefit from being produced to focus on both form and content, and the story and figures will have to be interesting, challenging and exciting enough to motivate the students. There will be requirements, of course, to be historically accurate and to not give a one-dimensional picture of an incident when society and/or history might be the subject. In one way or another, the game will have to challenge the student`s predetermined ideas and inspire critical thinking. Going in and out of roles, playing with and experiencing different imagined worlds, reflecting in-role and out-of-role situations can stimulate a wide variety of cognitive processes.

[6] "Fiction" derives from the Latin word *fingere*, which means "think of/invent".

4.2 Article II

Other research and our observations show that early-years teachers often abdicate as an educator by leaving the children to themselves when they play computer games (Vangsnes, Økland, & Krumsvik, 2012).

Through survey, interviews and observations, it was revealed that there was often little correlation between what teachers say happens when playing and what we observed was happening. My observations from four pre-schools show that educators are seldom present in the gaming situations and almost never participate in game activities, while the pedagogical leaders and the pre-school teachers in the survey and in the interviews say that they mainly participate in game activities.

At the same time, I see that the child and teacher meet and go into the gaming situation with different expectations and perspectives. In other words, we can say that the child, teacher and the game represent opposite discourses, and I have discussed what happens when these tensions or discourses meet.

When teachers try to implement and configure a meta-communicative and didactic project to the children`s computer gaming, they meet their opponent in the children's playful approach to the game. In addition, a collision occurs between the teachers' didactic project when it meets the game's own form and interactive character.

It is the tensions in this complex practice situation that I call *didactic dissonance*.
One of the main findings in Sub-Study II is that a conflict arises in the gaming situation between three discourses: 1) the game's discourse, 2) the teacher`s discourse and 3) the child's discourse, also understood as a conflict between two pedagogical voices struggling for the child`s attention: the teacher`s didactics built on social constructivist theories and the game's didactics based on a behaviourist pedagogical foundation.

As highlighted in the extended didactic triangle, it is not only the child and teacher who provide premises for the gaming situation; the game in itself is also an actor by making guidelines/premises for how the different participants of the gaming situation can act. Regarding the content dimension of the didactic triangle, or what Shulman (1987) calls pedagogical content knowledge, the participants meet with different interests. Especially the

teacher, but also the game put emphasize on the content. The game gives the content a key role in game design, and the teacher chooses games that have clear academic content components. The child, on the other hand, comes to the game and the game situation with a different perspective, namely, the playing perspective. The academic content is subordinate to them. The child plays the game because the child likes to play.

Educators see themselves as adults who are participating in the children's play and exploration, but not participating in the same way as the children. The following quotation from one of the interviews illustrates this point:

> Sometimes they (the children) need the freedom to experience things on their own and play without grown-up interference. But it is as well our job to be where the children are and support them when it is necessary. (Interview with male PST)

Teachers see themselves as the more competent other who through dialogue and other forms of supportive scaffolding contribute to the children's growth and learning. According to Liv Gjems (2009), everyday conversation is the most widely used medium of learning in Norwegian kindergartens.

Most children come to kindergarten with knowledge of computer games and how to play them. To children, playing computer games is primarily a way of being together and a way to play. It is something children do voluntarily because it is pleasant and fun. To be a good player means to them to be able to solve problems and win points. Thus, playing computer games contains elements of competition, as other games do. It has no other goal than itself. The players leave the real world in a way and subordinate themselves to the rules of the game. The game is constant, but at the same time, it changes every time it is played. No matter what kind of computer game it is, the children will normally transform it so that it suits their purposes. In line with Jessen (2001), I argue that they transform a more or less commercial product *for* children to an element within their own culture. They place it in a play context – a play discourse.

One reason pre-school teachers bring pedagogical digital games into the kindergarten is that they are a medium for learning – they are a tool that can be used to learn about subject matters such as numeracy or literacy or the use of computer equipment (Kvinge et al., 2010). Consequently, pre-school teachers incorporate the game in the didactic triangle and thereby give themselves a role in the gaming situation. Of course, the pre-school teacher understands

that it is a game for children – and the use of computer games is defined as a free play activity in most kindergartens. Yet playing, as mentioned above, also has a didactic aspect – in Norwegian kindergartens, play is also intended to be a medium for learning. Consequently, playing with computer games, like playing with Lego, is defined as a learning context – and placed in a learning discourse.

There is, however, another learning discourse present in the gaming situation, namely, the learning discourse of the game itself and the game producer. In this learning discourse, playing and learning are connected – the Josefine games are marketed under the motto *play and learn*. As mentioned above, however, playing and learning are not connected by means of dialogue in this discourse. The goal of the player's interaction with the game is to solve problems and to learn by choosing the right answer to a given question.

These conflicts help to explain the dissonance that can be found when commercial educational computer games are used in kindergartens and sums up the challenges that the pre-school teacher encounters. I have called this a *didactic dissonance* because it exemplifies what happens when different discourses meet, even though the dissonance might be productive as well as disruptive. These challenges, however, are of course not an argument against introducing and trying out computer games in pre-schools. To summarize the findings in Article II, with the risk of oversimplifying, I present a table which specifies how the medium (the game) influences the different elements of the extended didactic triangle that I introduced in Figure 1.

Table 2.: How the Medium (the Game) Influences the Different Elements of the Extended Didactic Triangle

Medium = the commercial educational computer game		
Teacher	Child	Content
The game limits the teacher`s possibilities for involvement and participation in the didactic situation.	The game predominates the child`s mental and physical interactivity in the didactic situation.	The game determines the content and the learning activity of the didactic situation.

4.3 Article III

When pre-school teachers take computer games into the kindergarten, one reason is that they see the game as a medium for learning and as a tool that can be used to acquire 1) academic knowledge such as understanding numbers and concepts, 2) general knowledge about the world and 3) technological knowledge on the use of computer equipment (Kvinge et al., 2010). When pre-school teachers incorporate the game in the didactic triangle, they thus give themselves a role in the gaming situation. Naturally, the pre-school teacher understands that gaming is a type of play for children, and the use of computer games is also defined as being part of free play activities in most kindergartens, but playing also has a didactic side in the pre-school teacher's thinking; playing is considered as a medium for and input to learning.

The pedagogue needs knowledge about children and their life-world, knowledge of prevailing curricula and pedagogical knowledge, including general theories and methods. The pedagogue is also responsible for knowing the individual child and in seeing the child as part of a larger whole of the group, department, day care and community. The didactic perspective will always focus on the teacher`s role in the didactic triangle. The pedagogue is central in regard to deciding the location of equipment, electing games and how to use them, and regulating the game activity. All these choices are part of the educator`s didactic assessments and say something about the basic educational foundation, vision, intention, tradition and discourse the pre-school teacher represents.

Should the teacher be able to fulfil these functions, she or he must have knowledge of the specific subject content, genre expertise about the media the content is distributed through and how to interact with the media. Only then can the educator stage the medium/game didactically on both the child's and the game's premise.

Most children come to kindergarten with knowledge of computer games and how to play them. To play computer games is first and foremost interest driven (Ito, et al., 2010) and a way to play. It is something kids do voluntarily and because it is nice and fun as well. The game basically represents the commercial children's culture, an entertainment culture for kids created by adults. At the same time, the play and learn games contain elements that mean they are related to the ideal and educational children's culture, that is, the play, learning and educational culture that kindergarten represents. In their interaction with the game, the child alters the game from time to time through their choices and their game

actions. I see that the children modify the game so that it is applicable to their purposes. According to Gadamer (2006), the player leaves the real world in a way and submits to the rules of the game and the play. In this way, the children put the game in a play context – a play discourse.

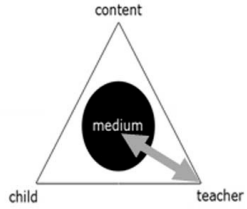
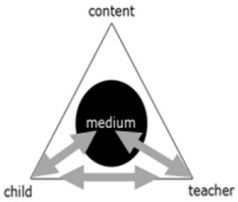
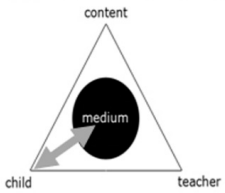
Teachers` personal epistemology, their visions about how children acquire knowledge, plays an important role in their knowledge, reasoning, strategies and participation in their way of teaching.

I have identified (genres of) teacher roles based on my microanalysis in the ethnographic material as the distinctions that emerge from kindergarten practice and culture and that help me interpret how computer games influence the practitioners` way of participating and interacting. By describing these forms of participation as teacher roles, in line with the observations, I want to show that every individual educator may choose different roles dependent on the specific situation, even though some educators tend to choose one specific role more often than others. I analysed and described the different teacher roles (see Table 3) based on the data, which was primarily collected through observations. However, data from the interviews and the survey also helped me determine the categorizations. These data gave me some information as well about why different teacher roles are chosen. This point is illustrated in an interview with a male pre-school teacher; here, the supportive teacher role is underlined:

> They do not always make it right, so they need some guidance during their gaming. They don't get much help (from the game), so we have to guide them. . . . (Still) my intention is to let them try out as much as possible themselves, and if they wonder about something, they ask. I try to stay in the background, in the back row, from where I can observe what they are doing. (Interview, 16.03.2009)

My findings as described in Article III are categorized in the following table:

Table 3. Different Teacher Roles in Children`s Computer Gaming

	The Intervening Teacher Role		**The Supportive Teacher Role**		**The Distal Teacher Role**	
	Scene 1a	*Scene 1b*	*Scene 3a*	*Scene 3b*	*Scene 2a*	*Scene 2b*
Pedagogical role	Meta-dialogic	Instructing/ directing	Assisting	Guiding/ directing	Arranging	Absent
Didactics	Against the game's didactics	In line with the game's didactics	Dialogic didactics	In line with the game's didactics	Free-play didactics	Free-play didactics
Game dramaturgy and didactic dramaturgy	The didactic dramaturgy is not linked to the game's dramaturgy.	The game dramaturgy determines the didactic dramaturgy.	The game dramaturgy is integrated in the didactic dramaturgy.	The game dramaturgy determines the didactic dramaturgy.	No link exists between the didactic dramaturgy and the game's dramaturgy.	No link exists between the didactic dramaturgy and the game's dramaturgy.
Interaction: Main emphasis	Teacher–medium 		Holistic 		Child–medium 	
Teacher participation	Spectator and competing actor	Spectator and co-actor	Participating spectator	Participating spectator	Spectator and arranging assistant	Spectator and technical assistant
Didactic dissonance	High		Low	High	High	

5. Discussion

This chapter comprises four sections. The first discusses findings and design related to previous research and theory. The second discusses the limitations and challenges of my research. The third section outlines the implications of this doctoral thesis for teachers and teacher education as well as for future research on media taken into didactic contexts. The last section presents some concluding remarks.

5.1 Findings and design related to previous research and theory

Although a growing volume of research has been examining children`s new media practice, ethnographic researchers such as Mimi Ito point out that what is generally lacking in the literature is an understanding of how new media practices are embedded in a broader social and cultural ecology (Ito, et al., 2010, p. 4). In my doctoral thesis, I have examined in particular one specific media, educational computer games, and its embedded practice in an existing social structure exemplified through the cultural ecology of kindergartens. My work has aimed at addressing this lack of research by a) conducting a reception and production analysis examining the interactive dramaturgy of the medium computer games per se and b) conducting in-depth studies of how the gaming practice influence the dynamics of the child-game experience as well as child-teacher interactions.

This doctoral thesis has a foundation in the theories about theatre and performance studies, exemplified in dramaturgy as a core concept. It is situated as well in an understanding of how demanding it is to be a teacher or pre-school teacher. We want excellent teachers who are able to combine excellent theories with excellent practice and who have a deep understanding of the world and the capacity for meaning-making through communication. Relational education is based on a belief that education takes place in the communicative interaction between the teacher and the student. The concept of performance has thus lately influenced theories about communication.

> What an utterance means, in other words, is not secured or safeguarded by its reference to something outside of the sphere of communication, but depends crucially

> on the process of communication itself. What we have here, then, is an approach in which the "performance" of meaning in communication is central. (Biesta, 2010b, p. 19)

Biesta argues that there is a gap between the learner and the educator and that education is not located in the activities of the teacher, nor in the activities of the learner, but in the interaction between the two. Education, in other words, takes place in the gap between the teacher and the learner (ibid p. 13).

This view has similarities with what we (Vangsnes, Økland, & Krumsvik, 2012) concluded in Article II. We found that the different participants of the didactics constitute different perspectives in their joint interactive meeting. Being situated in different discourses might result in educational conflicts. These conflicts can be interpreted as being productive more than disruptive because they represent a potential room (Winnicott, 1971) for exchange and production of meaning. From my point of view, there is a third party in this meaning-making process in addition to the teacher and student; I think that the content is presented in a form or medium that represents a discourse on its own. Consequently, it seems that a conflict occurs between three discourses or ways of understanding and talking about the game, namely, the discourse of the game itself in addition to the discourse of the child and the discourse of the teacher. This is exemplified in the didactic triangle (see Figure 1). The teacher`s approach in this dynamic didactics is often constituted in a dialogic pedagogy (Bakhtin, 1981; Dysthe, Bernhardt, & Esbjørn, 2013; Rommetveit, 1974; Sidorkin, 1999) understood as a way of communicating through dialogic interaction, where the informal conversation is central. I have found that in this dialogic meta-approach, the teacher trying to *communicate about the game* while the *child is playing the game* is an unfruitful and inconsonant communicative practice. I have called this *didactic dissonance*. However, there is a generative potential in divergence and dissonance that is equally important, and that arise in situations where different perspectives meet. This is a way of thinking that involves an active engagement with difference and diversity, and I have concluded in Article II that didactic dissonance might sometimes be more productive than disruptive (Vangsnes, Økland, & Krumsvik, 2012).

Having this perspective as a platform, it seems adequate to establish interactive dramaturgy as a way of theorizing about didactics because the interactive dramaturgy does not try to bridge the gap, but tries to understand what happens in the gap. Biesta says that the

transformative gap cannot be controlled by any of the partners in interaction, but that it makes communication possible at the very same time (Biesta, 2010b, p. 21). According to Skjervheim (1996), a real dialogue can only take place when the participants of the dialogue are mutually understood as subjects who can present their own personal point of views and who are listened to. In order to accomplish this, Skjervheim pointed out that the relation has to be triangular: 1) person A in dialogue with 2) person B about something, 3) a theme or subject matter. If we solely draw attention to the relation between student and teacher, without linking it to the curriculum or activity, we may be in danger of objectifying the other. In this way, we can assume a spectator role to the other and thus deprive the other the opportunity to be participant in the relationship (Skjervheim, 1996; Østrem, 2008). Instead, it is important to establish a mutual engagement in a shared topic. This is one of the reasons I have chosen to have the didactic triangle as a model for analysing the didactic context. Additionally, it forms a basis for placing the medium in the centre of the triangle; it is not just that all educational situations contain content, as the content comes in different forms or media (Figure 1). The relations between the different parties of the didactic triangle are necessary and vital to all didactics and to the communicative practice and the constitution of different teacher roles. The teacher who is good enough needs knowledge about the subjects in general – and subject didactics, learning, development and building, as well as knowledge about communication and methods suitable for different situations and themes. Education is always about something; it has content, a theme, a creative process and a problem to be solved which is materialized in some kind of medium. A computer game represents a medium that incorporates all this. In terms of the didactic triangle, I want to exemplify that the medium is part of the myriad of interactive communicative practices that didactics is all about. Likewise, one of my primary arguments revealed in the study is that the medium is not only a vital part of the interaction. The medium invites a particular form of interaction with its recipient in a way that can either open or close the possibilities for others – including the teacher – to interfere while the student is in an interactive dialogue with the medium. Some media might thus be more or less suitable for this kind of educational use. I have only studied educational computer games implemented in kindergartens, but most likely the specific interactive form of each medium will either open or close for the teacher`s different roles to take place. By analysing the different teacher roles the teachers might take when being part of the didactics around computer games in kindergartens, I found that the pre-school teacher switches among three different main roles; the distal, the interfering and the

supportive role. In line with Plowman and Stephen (2007), my study focused on the teacher's role, but whereas they investigated the implementation of ICT in kindergartens in general, my study is restricted to examining the teacher's role in computer gaming situations. Plowman and Stephen considered the teacher role in light of the concept of guided interaction (proximal and distal) to identify a teacher role that is either face to face or takes place at a distance from the specific learning interaction. My study, which is based on a dramaturgic perspective, highlights the interplay between the parties that are represented in the extended didactic triangle (see Figure 1), analysing the social didactic interaction as well as the interactivity between the game and the gamer. The particularity of my study is the fact that I see the role of the teacher, the role of the child, and the character of the content in light of characteristic features of the medium itself.

5.2 Implications

One hypothesis that can be outlined from this study is that educators need to put greater emphasize on the role of the medium in didactic planning and evaluation. I have indicated this by placing the medium in the middle of the didactic triangle, providing particular focus for educational research and practice. This means that different forms of expression or different media afford different contents of individual experience as well as of social interaction. Meanings emerge in the meeting of form and content – in the discourses, genres, and modalities of communication (Bruhn Jensen, 2010). Computer games represent examples of forms of communicative interaction; thus, they present a distinctive resource for the educator. The main point is that every medium has its own characteristics; knowledge about the medium taken into practice is of vital importance in order to integrate it in a meaningful way. I suggest to transform Mishra and Koehler`s (2006) technological pedagogical content knowledge (TPCK) model to a media pedagogical content knowledge (MPCK) model in order to conduct educational media research (see Figure 7).

Regarding computer games, this means that genre-specific form (dramaturgy) and use (dramaturgy and didactics) analysis as well as the interrelations between the two will be conducted. Due to this, I outline some strategies for professional development for teachers in computer gaming situations in order to gain successful use of new media. This includes an effort to engage teacher`s MPCK knowledge of the interaction between media, pedagogy

and content and thus an increased focus on a) media knowledge, b) pedagogical knowledge and c) content knowledge.

My main point here is to borrow the concept and model TPCK and transform it into the study of different media. By exchanging the technology part of the model with media, the model can include media other than the technological ones. Here it is important to acknowledge that the three domains are not separate. A useful way to depict them is through a Venn diagram of three overlapping areas, as Mishra and Koehler do.

Figure 7. Media Pedagogical Content Knowledge (MPCK): A Framework for Integrating Media in Didactics

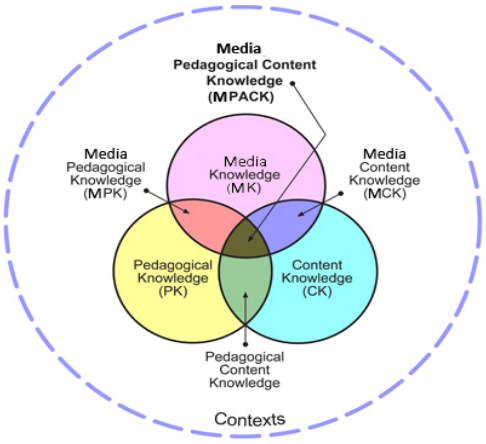


Figure 7. Based on Mishra and Koehler`s TPCK model.

The overlap is important because it indicates the interrelations between the different dimensions and shows the sectors where they meet. The sector in the middle shows the didactic room where all three dimensions meet and thus represents the purposeful knowledge the practitioner needs in making educational judgments. The model says something about what kind of knowledge is desirable to meet the purpose of education, but it does not say anything about how to perform or when/why/where it is appropriate to do what.[7] This competence is difficult to show in a model because it will differ from situation to situation

[7] Biesta has suggested that educational processes and practices function in three different domains: qualification, socialization and subjectification.

and is dependent on the practitioner`s capacity for improvising. This many-faceted competence might however be developed through repeating rehearsals, for instance. It is my opinion that teacher training and pre-school teacher training do not facilitate this kind of training to a large enough degree; the focus is on learning about more than on learning how or trying out different practices. The formation of becoming a professional is dependent on a combination of theoretical and practical knowledge and in being able to transform theory into practice. Knowledge about the medium taken into practice and knowledge about how to integrate the medium in a meaningful way in the didactic communicative process thus represent a very important competence. In line with this perspective I suggest trying a dramaturgic approach to didactics by introducing a dramaturgic didactic model (see Figure 8). As already mentioned elsewhere in my doctoral thesis, I view the didactic situation as a performance that is given life by all the participants (performers), as well as by its content materialized through and by a medium.

Dramaturgy can be a helpful tool for planning and performing didactics. This is so because dramaturgy has a framework and theories for describing and analysing actions performed by someone in time and space. These actions can be fictional, as in traditional theatre and drama in education, or the actions can be non-fictional, as in everyday activities. But, as Goffman has pointed out, we play different roles even in daily life and activities. Taking this perspective, it means that educators can get assistance from dramaturgic concepts and theories when planning, performing and evaluating structure, form and content of education. Dramaturgy operates, for instance, by describing different models for how to build and analyse actions in time and space. This includes staging a possible climax, wonderment, an "aha" experience, reflection and strong feelings as well as critical distance. In staged rehearsal rooms, complex relations can be made the subject of investigation and student teachers can be trained in acting in a reflective and competent manner. This discursive universe can thus establish a resonance for interpretation and understanding and might also respond to the changes in media ecology that have important implications for education. Specifically, these are new forms of media literacy, including computer games literacy, that have also changed the modes of media participation. Media literacy involves a) interpreting, understanding and critiquing media, b) gaining knowledge about how to communicate with the medium and c) expressing oneself creatively through the medium in a knowledge production process. Some of the dramaturgic models or ways of establishing actions in time and space invite a more open than closed form. By *open dramaturgy*, I mean that there is not

only one solution, or one way of doing it, but the students are instead invited to be co-operative, co-creative co-workers. This is why I focus on the interactive dramaturgic model as a way into didactics in this doctoral thesis.

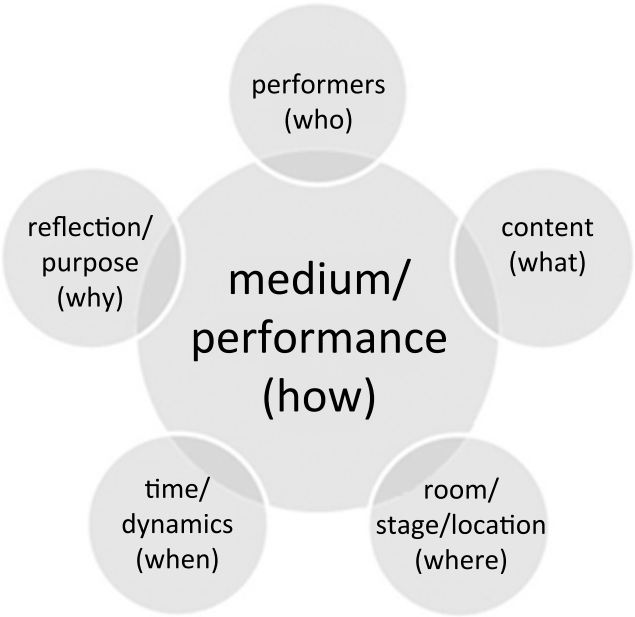
5.3 A dramaturgic didactic model

Figure 8 (below) shows what I have called a dramaturgic didactic model (DD-model) emphasizing the performativity of didactics. The model derives from my study on educational computer games and computer gaming in kindergartens but is inspired by Jank and Meyer`s (2006) hermeneutic structure model for teaching. The DD model is intended for educator thinking in terms of the character of the rationales put forward and which the educators, in their turn, can use to thoughtfully justify their praxis. In this way, the DD model is a body of theories and frameworks which can assist the planning process of pre-school teachers as well as teachers in general. It provides an alternative language for didactic reflection about educational contexts` inner life, and as such the model might be integrated and focused upon in teacher education and pre-school teacher education as well as in schools and kindergartens.

Putting the medium in the centre of the model highlights that the medium has been the topic of investigation in my study and because taking the media perspective represents a specific angle for examining and discussing didactics. The medium can either be the topic of investigation or reception, but it can also represent the art of being productive. Aristotle wrote about *episteme poietiké*, which is a creative productive knowledge that includes the art of making something (Kennedy, 1995). Creating form is a process towards a product, and the medium in the DD model can thus produce anything from a written text to a dialogue or an object of art. This means taking a participant-oriented perspective that focuses on the production process of aesthetic and symbolic media. Consequently, it also contains a media perspective which values the participatory and exploratory dimension, for instance, when students express themselves in and through some sort of medium. According to Dewey, our actions of experience are relational and reflective. To sum up, I regard the medium not to be an object or process in itself, but an object or process in context, which again stresses the relationship between the medium and the co-creative and interactive participants of the communicative process. However, in this study, I have focused on the relation and

interaction that occurs when a particular medium, the educational computer game, is taken into didactic practice.

Figure 8. A Dramaturgic Didactic Model: The Educational Performance



This is a model that does not replace the more traditional ones such as the relational didactic model (Bjørndal & Lieberg, 1978) or Klafki`s *bildung* perspective, which is understood as a qualification for autonomy, individual moral and social attitude (Klafki, 2001). These models can function as a backdrop to the dramaturgic didactic model (DD model). The DD model is a performance model that highlights the educators` *practical* knowledge, thinking and staging, but having its foundation in *theory*. Knowledge about the discourses between the teacher, the child and the content materialized in and by a medium is vital, as is the ethical dimension (for further details, see Article II). The DD model is also a relational model because it shows how all the different parts belong together and how they are more or less equally dependent on each other. The model`s task is to describe, analyse, problematise and develop intentional, actual or possible ways of performing education. The dramaturgy is present in the medium itself, in how form and content interrelate, and in how the medium is structured in order to communicate with its recipients. There is also a built-in dramaturgy in the whole didactic situation, in the way the practitioner orchestrates the content (by help from a medium) and the students in order to establish energy and make it as meaningful as

possible for the students, as well as to leave space for what Bakhtin (1981) calls the polyphony classroom. Education is here seen as a form of *bildung*, and its concern is to synthesize everything that occurs within instruction into a consistently coherent whole. It is within the concept of *bildung* that both subject matter and teacher orientation are bound together in a program of humanistic pedagogy (Künzli, 2002, p. 40).

When constructing the DD model, I started out from the extended didactic triangle (see Figure 1) but transformed it into a relational model in order to show that all factors are mutually dependent. The transformation made it also possible to add adequate elements and to show overlapping relations and connection to a central idea in a circuit, which in my work is the medium (see Figure 8).

Another central aspect about the model is that the optics can be changed by replacing the concept in the centre of the model with one of the other concepts. This will necessarily entail a switch in focus and cause other perspectives. If we instead put the teacher or child (performers) in the middle of the model, the emphasis would be slightly different, even though it is important to state that all the elements are vital and necessary in order to view the planning and the organizing of teaching from a dramaturgical point of view. The DD model illustrates and describes the six elements of a practical dramaturgic approach to didactics which can be related to all subjects, to the different media and to general didactics because they all deal with the same problems, according to Klafki. The six elements of my model are: medium/performance, performers, content, room/stage/location, time/dynamics and purpose.

5.3.1 The medium

The medium that has been analysed and examined in this doctoral thesis has been a medium of the first and third degree (Bruhn Jensen, 2010). The first degree is represented by the human body being a necessary and sufficient material condition of communication and thus both productive and receptive in the didactic dialogue.

> Media of the first degree – human bodies and their extensions in tools – externalize accounts of actual as well as possible worlds, and enable each of us to communicate with others about such worlds for both reflective and instrumental purposes. (Bruhn Jensen, 2010, p. 66)

The educator uses the dialogue as a medium for socialization and learning, and thus the dialogue is a central part of the teacher`s discourse.

I have also examined a meta-technological medium of the third degree represented by the computer game. However, all kinds of media are taken into didactic practice, and it is my presumption that the teacher intentionally (but sometimes unintentionally) presents and illuminates the content with help from a medium. As noted in my analysis, the medium might be rich and multi-faceted, exemplified by the technologically mediated computer game, or the medium might be presented and performed between and betwixt human bodies in face-to-face interactions, exemplified by the educational dialogue. The analysis of a certain media product or object has different dimensions. We can examine and interpret the object (here represented by computer game and dialogue) as a certain performance (event) that takes place at a certain time and in a certain room. It can be viewed as a form of act conducted from a certain spectator position. However, in this context, it is substantially that any medium has dramaturgic, or action-assigned qualities, regarding participants, content/story, time/room and action structure as well as reflections. A medium is an object or a process consisting of several modalities, contracts and relations that together constitute a flow in rhythm, energy and interactivity. Another dimension of the medium in the study is the underlying content and theme dimension that can either be fiction or non-fiction. This implies that most media are complex because they communicate dramaturgically through different modalities created by the producer of the medium and materialized by the real or fictional characters` position in time and space. All together, this becomes a polyphonic utterance, mixing reality and fiction and the referential with the performative. The medium creates a relational condition between the producers and the product, between the performer and the performance and between the performer/performance and the "spect-actor". By using Boal`s concept, spect-actor (instead of spectator), I want to highlight the active, co-creative, relational and interactive aspect of the recipient, who is an equal subject in the communicative process. In this matter, I am also influenced by Fischter-Lichte (2004) and her transformative performance theory. In accordance with Schechner (2002), she views the movement between the different parts of the communicative process as a pendulum or dialectics between two poles. She calls this the *auto-poetic feedback loop* (Fischter-Lichte, 2004, p. 47), showing that the communicative process is an action-reaction process leading to an *emergence of meaning* (Fischter-Lichte, 2008, p. 138). When the involved discursive

systems (the medium`s, the child`s and the teacher`s discourse) meet and interact, a transformation is established.

Structuring the media into a didactic whole

Dramaturgy signifies the way the event is composed, presented and conducted. Structure and model thinking are key elements in the framework of the DD model when it comes to the dramaturgy of both the medium and teaching. These terms represent the process of giving form to something and thus the *how* dimension of the model. The didactic situation is a whole which frames a beginning, middle and an end. Each of these three parts can again be divided into smaller units that constitute meaning. How this meaning-production process takes place will be constituted in the interaction between the different parts of the extended didactic triangle and will differ from individual to individual. However, the educator orchestrates the didactic event and serves as a process and production dramaturge, and facilitates, structures, observes, responds, transforms and develops new sketches and material. Dramaturgic choices related to education include a closed or open structure, fictionality, compression, expansion, reiteration, interruption, tension, rhythm and the use of media. The exposition of the event may be delivered through various means and is normally followed by a rising action that builds toward the point of greatest interest and which culminates in dènouement (from *nodus*, Latin for knot). Dramaturgically, this means to untie the knot. In didactics, *dènoument* may represent the unravelling and untying of complexity, a form of conclusion in which the students as protagonists have reached a higher level of knowledge than when the theme or lesson started. One core concept in traditional dramaturgy is *peripeti* (Norwegian for Greek *peripeteia*), which means change, or point of no return, and refers to a crucial element in dramaturgy. The term originates from Aristotle`s *Poetics*, in which *peripeteia* is the condition of the dramatic progression towards catastrophe or climax. *Peripeteia* is most effective when it coincides with recognition, or *anagnorisis* in Greek, meaning a sudden awareness of a real situation. These dramaturgic concepts are central in didactics from my perspective and can be of valuable importance when the teacher plans, constructs and performs the didactic situation. One important challenge in didactics is how to make interesting, motivating, exciting and challenging learning environments which provide interaction and establish rich learning opportunities. In particular, the challenge is to design fictional or real didactic worlds that allow for several climaxes (*peripeteia*) to take place that correspond with the children`s interest and recognition (*anagnorisis*).

Other central dramaturgic concepts supporting and structuring didactics can be dramatic tools such as rhythm, tension, contrast, symbol, rituals, sub-text and improvisation. These are all key elements in dramaturgy but can also represent a valuable contribution in how to structure and design *didactics,* in other words dynamic learning environments that require action, or rather a sequence of action. Every sequence, even though it has been carefully planned by the educator, will maintain improvisation, and the educator need a rich repertoire of dramatic tools in order to construct, compose, build or mount sequences that are meaningful, exciting and important to the students. An increased awareness and knowledge of these dramatic tools may help educators in constructing a meaningful and challenging learning environment.

In building the didactic framework, teachers can frame the what, who, why and how dimensions with help from different dramaturgic models (structures). The dramaturgic structure in didactics might have an emphasis on a linear structure, where the lesson/theme is seen as a whole that follows a logical sequence that is built on an activity followed by another activity (cf the Artistotelian dramaturgic model). Or, it might be structured as more episodic, a dramaturgy that stresses an epic, episodic style in the logic of a more open and workshop-orientated landscape (cf the epic dramaturgic model) instead of a cause-effect logical process. Different dramaturgic models contribute to different forms of communication (Szatkowski, 1989), and by combining different models, educators can open up for and enable diverse education – from more teacher-based dissemination to more problem-based learning – as well as juxtaposed perspectives, forms of expression and methods of learning. In line with one of my main findings in this doctoral thesis, I want to emphasize the *interactivity* in the *dramaturgic didactic model*. Interactive dramaturgy in didactics means a focus on the active, perceptual experience where the students interact with the medium, teacher and fellow students in a meaningful way. Didactics is basically a relationship between an educator and the one being educated, and the theory of education should be a theory about the interaction between the teacher and the student (Biesta, 2010b). One important challenge for the educator is to open and present these communicative practices in a way that make them as dialogic as possible[8]. How can spect-actors enter a dialogue with a medium such as a computer game or how can they enter a dialogue with the

[8] Dialogic in this context refers to how human beings create meaning through communication, interaction and thinking.

material in order to perform a product, including a text, a physical exercise, a dance or a drawing.

An interactive dramaturgic approach to education will highlight how to establish spaces where all students feel safe to contribute and where they are all seen as individuals. This is hard to achieve, but in composing the structure, the continuity, progression and selection, the educator could establish potential rooms (Winnicott, 1971) for the students to collaboratively examine, interpret and perform. According to Winnicott, all of us live in an inner, personal and *subjective world* surrounded by an outer contextual and *objective world.* Between these two worlds, he establishes the third, *the potential room*, which is the space of play and artistic experiences where we can hold and rewrite experiences from our inner world to a symbolic form (Austring & Sørensen, 2006). The potential room is thus culturally contingent because it is developed through interaction between the child, the surrounding cultural context and close caregivers (ibid p. 108).

Interactive dramaturgy focuses on collective processes, which again highlight the social aspects of education and *bildung*. The process of *bildung* will thus take place in a social room where the participants mutually affect each other. In line with performance theories, this means a shift in focus from what kind of meaning that is created in a social context to how meaning is created. In line with Szatkowski, I think aesthetic doubling describes a central aspect of this collective aesthetic interaction that can be developed, for instance, in an educational drama process. The distinctive feature is that the participants at the same time are part of the process both as themselves and as the role while having an awareness of themselves, the others and the fiction. To sum up, the educator can establish potential rooms or fictional rooms which allow the students together with the teacher to try out alternative viewing platforms in order to shed light on an issue from multiple sides. Multiple values and perspectives can thus be rehearsed and reflected upon, establishing different ways of knowing through going in and out of different roles and fictions on a continuum between distance[9] and closeness. A main element in this practice will be the *as if* dimension: What happens if I do it this way and what might happen if I take another stance and do it from another perspective? Going into different roles and trying out different roles and media

[9] For further reading about this, see Article I.

connected to the topic will be a central way of working. The roles are not predefined but will be developed in a dialogic interplay between the actors of the communicative situation (Gadamer, 2006). Since education is such a complex and challenging activity on many different levels, it is important that the educator is able to grasp the moment and expand it through an interactive dialogic approach. Being a facilitator of this dynamic meeting, the educator needs a repertoire of dialogic strategies, methods and media, in addition to knowledge about how to build dramaturgic structures that support this kind of didactics. The teacher, as the skilled facilitator (Swartz 2005), is the leader of these processes and is the one in charge of staging the subjects, themes and media in the best ways.

5.3.2 Content

Content can be presented and explored through reality or fiction and represent the central performative element of any didactics and the *what* dimension of my DD model.

The content in many ways derives from the teacher`s discourse, meaning that the teacher is tied by the four instruments or systems for political governing of education: the legal, economic, ideological and evaluation system (Lindensjö & Lundgren, 2000; Whitty, 2002). These centralized systems strongly regulate and frame the curriculum and content, and through education, we reproduce our culture from one generation to the next. The changes in the volume and structure of knowledge exemplified by the easy access to information, as well as to globalization, make it difficult to centrally plan and regulate the content of education (Aasen, 2013). A dramaturgic approach to didactics cannot solve this challenge but can contribute by building sequences of action in order to view a topic from different angles. This can be conducted through establishing several collective creations of what Monica Prendergast (2011) calls socially imagined performative *utopias*, a concept borrowed from the performance theoretician Jill Dolan. Her main point is that it is possible to establish alternative society and reality models to be examined and explored in education. This will in turn represent a shift in what is going to be the content or curriculum of education from a set of pre-fixed content to a more open-ended and exploratory approach to content as part of the process of *bildung*. Performative utopias can be established by conducting alternative dramatic rooms in fictional and real time together with alternative fictions inhabited by students in roles, pretending to be someone else in a pretend play. In this way, many alternative actions may be conducted, analysed and evaluated. Stephan

Grätzel (2003) argues that each day we are captured by and locked within the narratives in which we participate, but from which we are unable to distance ourselves. The theatre is important because it shows us from a distance that we have been captured. It is the same notion of distance that can be seen in Brecht`s epic dramaturgy and that, from my point of view, could be utilized in general didactics. Grätzel emphasizes that to achieve this distance, theatre must take place on a stage with an audience present. The opposite can also be said: that by taking on a role and being both oneself and the role, one is able to identify oneself with the role and critically reflect upon what is experienced when being in the role to an even greater extent than when one is a member of an audience. Holding the two worlds in mind at the same time, being both oneself and the role means that the student has a certain distance to the role and thus to the explored content, which makes it easier to critically discuss and evaluate the content. Schechner makes a double negation in order to highlight this point: "In role we are not ourselves and not not ourselves" (Schechner, 2002).

Following Bruhn-Jensen again, media constitute a unique set of resources extending the human body in diverse contexts of action – tools, technologies and meta-technologies (Bruhn-Jensen p. 65). This means that content can be communicated and experienced through, for instance, dialogue, monologue, books, films, experiments, the Internet, play, computer games and through active participatory exploration of written, oral, bodily and artistic expressions. It can be presented and explored in reality (for instance through dialogue), explored in reality but presented as fiction (for instance a book, a film or a computer game), or it can be presented and explored by the students entering a fictional world in a role as someone that inhabits this particular fictional world (for instance, an educational drama process). Taking this perspective highlights some challenges, and it represents opportunities for all the involved performers, both the educators and the students.

5.3.3 The performers

All didactic situations include human beings where some (the teachers) inhabit and perform the role of being the more competent other in relation to the ones who perform the role of being the learner. In other words, we have a teacher who teaches and a student who studies. Together, they represent the *who* dimension in my relational DD model. They have different roles, aims and purposes in the didactics, and they come to the didactic context representing different discourses. There is a potential for conflict when different discourses meet;

however, this conflict might sometimes be more productive than disruptive, meaning that the polyphonic gives voice to more individuals and can establish a potential for transforming a richer meaning production, even though the orchestration of the polyphonic might be a challenge to the teacher.

The teacher`s discourse

The teacher can be seen as an agent who serves as a bridge between the learner and the content or subject. Consequently, the teacher has to know the subject he or she teaches as well as knowledge about the students` knowledge, skills, interests, needs and abilities. Finally, teaching requires teachers' full awareness of their doings and interactions (Künzli, 2002, p. 36). Norwegian pedagogue Erling Lars Dale says that educational rationality is linked to three aspects of the system: teachers' understanding of the goal, their interpretation of the situation and sensitivity in the context (Dale, 2002, p. 258), and he goes on to say that educational rationality is a cultural practice, an underlying code because they (the teachers) are not the ones choosing the rules (rationale). Following this perspective, the educator is influenced by the discourses of the school, curriculum and policy documents, which all put strong constraints on the educator`s practice. Assessment, for example, is a central element, but it will not be further discussed as part of my thesis and model. These are factors that most didactic models discuss. I want however to highlight the thinking process, the epistemological, ontological, theoretical and practical position that teachers must take when preparing, conducting and evaluating their teaching. The core (normative) foci is thus on the reflective teacher seen as an expert developing an overall teaching plan. In light of this teacher-thinking perspective, teachers are obliged to carefully examine their role in interaction with a) the studying participants (the child`s discourse), b) the content and medium (the medium`s discourse), and c) their position as a representative of the meso and macro level, and their values, their approach to knowledge and learning, and their abilities, goals and personality (the teacher`s discourse). "The core of the teacher`s professional work is to discern in what way, and how, such a web of potential interactions might be productively engaged" (Westbury, 2002, p. 65).

Consequently, educators need to thoroughly discuss the different roles they might choose when working with a specific content or medium and a specific group of students. Whichever teacher role is chosen, the educator frames the didactic situation in order to

create motivation, inspiration, structuration, variation, concretization, evaluation, individualization, cooperation, immersion and critical distancing to the chosen content and implied media. These efforts are made in order to establish the students` a) *proficiency in*, b) *knowledge about* and c) *attitude towards* a topic. The first is connected to the process of production, the second to reception and the latter to reflection.

The analysis of computer games in the didactic context of kindergartens showed us that the teacher role might be divided into three categories: the distal role, the intervening role and the supportive role. In addition, the analysis showed us that there might be productive and disruptive consequences connected to the different roles. However, it is my presumption that every medium requires different approaches and thus challenges preconceived stereotypic roles. Likewise, the children`s knowledge and familiarity with the medium should also affect the planning of which perspective and teacher role to choose.

The child`s discourse

The students` relation to the medium is a vital precondition for the educational situation and thus a core aspect in didactics. The instructional process aims at achieving the goals stated in the curriculum, and the primary purpose of the teaching-studying-learning process is learning and personal development. The children will thus be the protagonists of the educational situation.

Children are not a homogeneous group, and childhood is socially constructed, historically variable and a contested category (Corsaro, 1997; Fine, 2004). Children collectively participate in society, in which children "negotiate, share, and create culture with adults and each other" (Corsaro, 1997, p. 18). In children`s own culture, media-play, or ludology, (Rønnberg, 2009a; 2009b) is one central play category, meaning children playing with or inspired by different mass media[10]. Sandvik (2009) has suggested that media-play can be divided into two categories; media-play of the first and of the second degree. This doctoral thesis focuses on media-play of the first degree, which means playing *with* the medium. The children engage in game worlds in a playful way, and they explore and negotiate and navigate the tensions between constraint and freedom because games are *designed*

[10] Rønneberg problematizes the term mass media, but that is not a central discussion in this doctoral thesis.

experiences (Squire, 2012). According to Ito (Ito, et al., 2010), this is an interest-driven participation from the children`s standpoint and not a mandatory activity imposed by adults. This playful interest-driven approach is at the core of the children`s discourse.

5.3.4 Room /space/stage/location

The room category forms the physical framework in didactics as well as in life in general and constitutes the physical and material *where* dimension of my model in this context, even though the room concept also can be understood more abstractly. The material room can, for instance, be transformed into a fictional room with the help of props or with help from the way the performers act and talk in the room. Space can thus be produced, performed and constructed through cultural practice.

The physical location of education in my study is either the common room of kindergartens or a special room for computer gaming and arts, as I found in one of our research kindergartens. I found that the location in turn affected the teacher roles and especially that the *distal teacher* occurred more often in the common room than in the room established for gaming and art. Likewise, I observed the *supportive teacher* more often in the specialized room. This is not surprising in light of the purpose of the activities; when a room is designed for gaming, it shows an emphasis on the activity and is therefore likely to be recognized in the teacher`s attitude as well. A natural implication to this is that every part of the DD model interrelates and needs to be viewed together; the content, the medium, the students and the way the educator wants to perform his or her own role will consequently affect how to establish the room. The room or space can be a backdrop *to* the action or an environment *for* the action; it can be signifying, mechanical or possess an aesthetic function. Thus, as educators, we question the logic of the space, which again questions the dramaturgy of the room: What, where, why, how, who is going to inhabit the room and what is the purpose of it? Room or space is a central element that comprises the other elements and thus illustrates how the elements depend on its context. It represents together with time an entrance to didactics consisting of reflection about communication.

5.3.5 Time/dynamics

The concept of time is an important entrance to didactics, and dramaturgy represents a way of working with the spatial and moveable aspects of time. This is the *when* element of my model. We cannot understand room without seeing it in the context of time and vice versa. According to the DD model, time is a here-and-now phenomenon at the same time as it can be manipulated through fiction; it can be compressed or expanded and instead represent a there and then perspective. We can, for instance, expand the moment by making a pause in order to facilitate a space for the students to be able to wonder, reflect and have an inner dialogue. Another way of expanding the moment is to give them enough time for going into depth on a theme or an activity.

Time–space compression often occurs as a result of technological innovations that condense or elide spatial or temporal distances. An example can be turn-based computer games. In games where the game flow unit is time, turns may represent days, months or years. This is equivalent with didactics, where we here and now can explore and perform parts of history, its past, present and future. Indirectly, we work with time elements through the other elements, and thus the time element can help us understand how the other dramatic elements and tools create fictional and non-fictional events. As educationalists, we can take advantage of and learn from theatre, for instance, by narrowing time or by creating fictional rooms. Dramaturgy thus constitutes a way of working with the spatial and moveable elements and includes sensitivity for timing, rhythm, pace and attention and which can be seen in sight, pauses, gestures, actions and movement. The experience of time is dependent on what happens, where it happens and why it happens.

5.3.6 Reflection/purpose

A key feature of this category is the potential to inform pedagogical choices and strategies in a fundamental way. A rational, reasoned approach to decision making constitutes the *why* dimension of the DD model.

> The teacher must thoughtfully explore, by way of hermeneutic reflection, the relationship between topics of the curriculum and their educative potential, these topics and “larger” cultural forms, and the life-worlds of a particular group of students. (Westbury, 2002, p. 65)

In response to this perspective and in line with Biesta (2013), I want to highlight that education is framed by a sense of purpose, which means that teachers always need to make judgments about what is desirable in relation to the different purposes that frame their practice (ibid). Biesta sees the question of educational purposes as a multidimensional question because most educational practices function in relation to different aims. He has divided these aims into three domains of educational purpose: qualification (the domain of knowledge and skills), socialization (the educational encounter with cultures and traditions) and subjectification (education`s orientation towards children and students as subjects of action and responsibility, not objects of intervention and influence). These three domains have similarities with the three discourses in my work: there is always something to learn (the content and medium`s discourse), there are always questions of tradition and ways of being (the teacher`s discourse), and there is always the question of what Biesta calls "the person" (what I call the child, or the child`s discourse). In didactics, the teacher needs to make reflective judgments, not only about the aims of education, but also about the means, the media and the ways in which education proceeds.

5.3.7 Closing comments on the model

A model is a composition of concepts which represent something else and is meant to help us know, understand and simulate the theme it represents. Since a concept might map to multiple semantics, a model cannot tell us the whole truth, but it can help us to draw attention to certain concepts.

The above DD model provides a contribution to thinking about didactics but cannot be seen as a closed model where all the elements are exhausted. Further research is needed in order to complement my presented proposals.

5.4 Limitations and challenges

Conducting research requires an ability to establish delimitations, deal with challenges, and to be aware of and reduce the impact of limitations. The boundaries of the doctoral thesis are the goals, including the research questions, the research context, the chosen theories and the sampling. In the following, I discuss some limiting aspects of two delimitations and some

other limitations that may place restrictions on the findings. I conclude with the most significant challenges to my research.

All research has to argue for how generalisable its findings are. Even though postmodernism and postcolonial theories have a tradition to refuse universalism and general theories – that there can be no universal claims in the human sciences – this philosophical world view has lately been questioned by many researchers. Today, most scholars agree that we at least have something we can call emotional universalism and universals about time and space (Wierzbicka, 2005). Use of the adjective *universal* is only appropriate if, in practice, it describes a principle that can actively be applied to universal contexts, and instead of describing something constant, it shows something not given, something that is underway. I have elsewhere in my doctoral thesis written about going from the particular to the universal or general and want to assert that the most important challenge for the educator from my point of view is to illuminate a topic from different angels in order for the students to be able to critically take a stand. In Article I, I briefly discussed whether computer games might contribute to support this challenge and concluded that it largely depends on the built-in dramaturgy and learning strategies of the particular game.

The empirical study presented in my doctoral thesis is a small-scale study conducted over a relatively short period of time, with relatively few children and by only two researchers. Richer and more complete data could have been provided by longer-term participant observations (Becker & Geer, 1957). This would have produced both more and more different kinds of data and could thus have supported trustworthiness by identifying patterns over time. However, my study emphasizes transferability and thick descriptions rather than generalisability. Regardless of the length of observations, a limitation of a participant observation is that a recorded observation about a group or an activity can never be the full description due to the selective nature of any type of recordable data process. Meeting some of the mentioned limitations in an effort to conduct richer data material, I extended the video observations with field notes and semi-structured interviews with eight pre-school teachers.

The kindergartens and the children can be regarded as representative since they are typical Norwegian medium-size kindergartens. We asked however for kindergartens that already had implemented computer gaming as a regular activity on a daily basis; this was done because we did not want to interfere with the kindergartens` policy in the field.

Another limitation is connected to the data I chose to focus on, especially in Articles II and III. As mentioned in the methodology chapter, I started out with a research question about dialogues between the gamers. However, since so little verbal dialogue took place between the children, I found myself becoming more interested in the different teacher roles that appeared, and after a while, I changed the focus and the central research question. While viewing the video recordings and transcribing my material, I became aware of a pre-school teacher who was an active participant in the gaming situations but seemed to have a project that somehow was in conflict with the project of the playing children (for further details, see Article II). After this discovery, I continued to search for different ways that pre-school teachers interacted in and around the computer gaming situations. This can of course be criticized because a) other interesting parts of my material have not been examined, analysed and interpreted, and b) there is a danger that I from this point on started looking for signs and evidence that could undermine my preliminary findings. Following this perspective, we can say that some of the analysed material is not representative; rather, it exemplifies and highlights the different teacher roles that were categorized. During the research processes of Sub-Study II and III, I have thus focused more on the educators` perspectives and roles than on the role of the children and if and how they learn from playing computer games. Focusing on the two latter aspects could of course have been valuable in itself and could have increased our understanding of the children`s perspective. It is also a delimitation that I have concentrated on educational computer games, even though I examined computer games more generally in Sub-Study I.

According to my theoretical and analytical perspective, there can be a certain danger involved in seeing something with unfamiliar lenses that might thus function as a prison of a particular terminology. The use and application of analogical theories and concepts can open up the possibility of devising new tools and ways of understanding, but they can also cause limitations if the transmitted concepts are too constructed, meaning that it can be hard to see how and why this new terminology expands our understanding of the chosen field. Related to this, we can talk about limitations concerning a gap between theory and reality exemplified through the development of patterns, models and categories. A different research team would probably generate different categories and label them differently. The patterns and models are representatives, and as such, they simplify a rich context. However, they can clarify and highlight central ideas and concepts.

Growing out of my material as well as from my already established pre-understanding, I have chosen to implicate a model for discussing didactics from a dramaturgic point of view. Some can criticize this because this means that I take a more general perspective in the implication part of my synopsis and construct a didactic framework that can be submitted to a broader educational context than kindergartens. From my point of view, this has become a natural continuation of my findings, my theoretical and analytical perspective, and my own experience as teacher and teacher educator, and thus the DD model represents one of my main contributions to the field.

5.5 Future research

A significant challenge presents itself when it comes to computer games research. Basic research questions will for instance need to bridge the domain of technology and media, which involves complex and deep problems. Game researchers have identified and explored a wide variety of scientific, technological, educational, cultural and practical implications and challenges arising from research on computer games and virtual worlds (Scacchi, 2012). In accordance with the theme of this doctoral thesis, I will focus on recommendations from Scacchi et al. regarding further research and complement them with my own thoughts. Almost all of the research groups presented in Scacchi concluded that when games are applied in new domains such as education, there is an increased need for content experts (p. 38) who themselves are not game developers. Since game design also has the characteristic of media design and art practice, this makes it a complex, hybrid process.

> In order to enable complex social situations in games, an interactive story progression will likely be necessary which requires the computational modeling of insights from narratology and the dramatic arts. Creating compelling autonomous actors in those and other settings requires computational models derived from the study of physical interaction akin to biomechanics coupled with direction and human-like cognition which may be taken from acting and psychology. (Scacchi, 2012, p. 31)

Following Johnson and Levine, who argues that virtual worlds are richly expressive environments that immerse the participant in a setting that includes visual cues, rich textures,

and realistic perspective, and vividly create a sense of place (Johnson & Levine, 2008), performative theories such as dramaturgy can be used to increase our basic knowledge of the game as a communicative medium possessing and facilitating the interactive process between stage and audience – game and gamer(s).

Another identified research problem is the need to bring the full creative power of the arts and the full interpretive power of the humanities to bear on the construction of novel technical systems that have the potential to move the field of computer games forward dramatically (Scacchi, 2012). It is only in the process of creating a specific work of media – that is, in the context of practice-based research – that the full training of arts and design practitioners will be able to productively shape technical approaches of current research and bring to light next-generation research questions (Daniels & Schmidt, 2008; Flanagan, 2009). I find this practical approach very interesting because it opens up avenues for applied theatre research (Nicholson, 2005) which aims at bridging situated aesthetic practices with the social and/or epistemological significance practices like this might have (Rasmussen & Gjærum, 2012). In applied theatre research, the main focus is to document, analyse and problematize the meeting between the medium`s form and content and the situated context. With the optics of cultural and anthropological theories, this means that the theories about theatre can be seen as an aesthetic language – and *bildung* form – that takes part in the society`s cultural production (Schechner, 2002). Implied in the cultural theoretical platform of applied theatre is the emphasis on viewing theatre as an event and focusing on the participants (Sauter, 2006). *Practice as research* means that valuable knowledge can be established in creating and performing practice, and the examination becomes part of the creative process up towards an artistic product. This kind of research will be part of the *performative research paradigm*, and the documentation can be an exhibition, a performance, a film or a computer game. Producing computer games can thus embody approaches appropriate to a wide variety of artistic creation and provide a new generation of meta-authoring – and new software development tools.

My contribution to the field is based on taking a certain theoretical perspective into a new domain, or rather two domains: the media domain of computer games/gaming and didactics.

> By looking through a different theoretical lens, we may also be able to understand problems where we did not understand them before, or even to see problems where we

> did not see them before … As a result, we may be able to envisage opportunities for action where we did not envisage them before. (Biesta, 2010a, p. 509)

An implication that has been derived from my study is the DD model. This is a way of thinking about education, including a didactic model that needs to be further researched, and it remains for the model to be tested out on didactic situations.

5.6 Conclusions

This doctoral thesis has explored how computer games function as a medium, how they are implemented in Norwegian kindergartens and what challenges this represent for educators. I have explored how dramaturgy can be a supplemental theoretical lens in examining and interpreting computer games in general and one game in particular (*Josefine and Sofus in the Carrot Park*) and likewise how dramaturgy can be a tool for examining, interpreting, planning and performing didactics. The final implication derived from my study is the proposal for a didactic model built on dramaturgic concepts and theories.

I started out with an examination of current humanistic theories related to interpreting and understanding computer games and found narratology and ludology to be the two main theoretical perspectives. At the same time, I found that there was a growing body of research, especially in Denmark, that had started looking at computer games with dramaturgic lenses. From this point on, I decided to do my doctoral thesis from the dramaturgic and especially the interactive dramaturgic perspective. I was however interested in what happens when these games are implemented in kindergartens and decided to follow four different kindergartens and how gaming was structured in these four schools. During these observations, I became more and more interested in looking particularly at the multi-faceted teacher roles that occurred (Table 3). I needed a model for analysing the didactics and suggested the extended didactic triangle (Figure 1) and an emphasis on the different discourses the child, the teacher and the media represent in didactics. As a result of the focus on the extended didactic triangle, the three different discourses and the different teacher roles, a need for a different didactic model occurred. My new model has its foundation in my overall theoretical perspective, which throughout the whole study has been dramaturgy, but is as well grounded in my already established foundation in performative theories and in my

wish to look at education as a stage consisting of performers, subjects and actions/events presented and experienced in real and fictional time and space. The educator is from this perspective in charge of the orchestration and thus designing the didactics. However, it is when the different parties of the extended didactic triangle meet and interact that real interaction takes place and new meaning is constructed.

This doctoral thesis follows up on work started by Brenda Laurel and her influential book *Computers as Theatre* (1993), where theatre was used as a paradigmatic model for understanding computers and the interaction between the computer and the human being. In the wake of this perspective, different experimental and ontological contributions can be seen as influences, especially those by Janek Szatkowski and Kjetil Sandvik. The most significant strengths of this doctoral thesis are as follows. I have made a contribution to the computer game research field built on interactive dramaturgy. The combination between this concrete theoretical basis and the empirical work analysing children playing on a general basis and analysing one particular game in use in the educational context of kindergartens provides a new insight that is a valuable contribution to the field. This specific design contributed to the development of the extended didactic triangle, which again formed the basis for discussing the three different discourses and thus contributed to the concept of didactic dissonance. Highlighting the medium as a core concept in didactics is as well a valuable contribution because the three dimensions of media are central in all subjects as in general didactics.

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Enclosed

I Article number I

II Article number II

III Article number III

IV Appendices (in Norwegian):

Appendix 1) Letter of request to the municipalities of Stord, Haugesund and Karmøy regarding access to the research field

Appendix 2) Information letter and statement of consent from the kindergartens

Appendix 3) Information letter and statement of consent from the children`s parents/guardians

Appendix 4) Letter of concession from the Norwegian Social Science Data services (NSD)

Appendix 5) Questionnaire

Appendix 6) Approvals from journals to include articles in the dissertation

Appendix 7) Transcriptions, relevant parts

Appendix 8) Acceptance to print pictures