Serious Games in language learning and teaching – a theoretical perspective

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ABSTRACT

The paper focuses on a part of a new project Serious Games on a Global Market which focuses on language learning and teaching. Serious Games are digital games and equipment with an agenda of educational design. The paper makes a theoretical argument for a Serious Games product based on theories of educational design and learning in relation to games. Furthermore technology based perspectives on language teaching and learning are described and in addition to this, the paper draws on data from two recent research projects that have studied the role of game based activity in children's digitally based practices in off school contexts. This theoretical construction will be employed in the developing of the prototype of the digitally based educational platform "Mingoville".

Author Keywords

Serious games, language teaching and learning, the educational design of games, formal and informal learning

INTRODUCTION

This paper is based on a project *Serious Games on a Global Market* (2007-2010), which is funded by The Danish Council for Strategic Research under The Programme on *Creativity, Innovation, New Production Forms and the Experience Economy*. The project intends to explore, build and implement prototypes in collaboration with companies, using their products and experience to develop knowledge about serious game challenges, educational design, and assessment with the aim of innovation. Furthermore the project will establish theoretical models that are able to predict the potential of serious games globally; and, on the basis of these models, generate theoretical concepts and practical methods for innovative product development, as well as produce credible knowledge about the benefits and outcomes of serious games.

Serious Games are defined as digital games and equipment with an agenda of educational design and beyond entertainment. Serious Games have learning as a distinct keyword and include, among others, learning games, educational games, training games, business games, and games promoting physical play; and they cross a variety of topics, target groups and contexts.

In the paper we shall focus on one aspect of the *Serious Games* research project, that is, the exploration and development of game based prototypes for language teaching and learning. The paper will address the question of how game-based material for language teaching and learning can be conceptualised through the theory of educational design.

The paper builds on theoretical and methodological approaches associated with the educational design of games, as well as on technology based perspectives on language teaching and learning. In addition to this, the paper draws on data from two recent research projects that have studied the role of game based activity in children's digitally based practises in off school contexts.

EDUCATIONAL DESIGN

The development of Serious Games is a challenge for educational design theory and practice as Serious Games is a new learning form in the field of educational design. Within this field two main approaches of educational design can be identified. One is a theoretical approach encompassing theories on the justification of the teaching, goals and content as well as criteria for the selection of educational content. The other is a practical approach encompassing planning and organisation of teaching and learning (Nielsen 1998). In the project we view the theoretical and practical educational design as preconditions of one another and we base our work on a broad definition of educational design as theories on and reflections concerning purpose, objective, content, planning, organisation and evaluation of teaching and learning (Schnack 2000, Him & Hippe 1997 Hopman & Riguarts 1995).

The development of digital teaching - and learning products has brought into focus educational design which is the concept we work with in the project. We define educational design as comprising Dale's three levels: practice level, organisation level and the theoretical reflection level (Dale 1989, 2000). Design as a concept can be defined as the plan or the model of what should be produced. Accordingly, in relation to Dale's three levels design will mainly be placed on the organisation level. However, since both theory and practice are preconditions for the design process, we regard the three levels as a whole – as preconditions for each other and as interacting.

The three levels are also central to both research- and production processes in all three sub projects. Traditionally, educational design has comprised teaching and has been the teacher's project. Project pedagogy developed within the critical-theoretical tradition emphasises learner participation and co-determination which has as a consequence that the student to a larger degree gains an influence on several educational design categories such as goal, content and organisation. When working with projects in the classroom, educational design shifts its focus to being both the teacher's and the student's project (Sørensen & Audon 2004). Since Serious Games to a large extent involves the student and brings production into focus, project pedagogy is a theoretical approach that is central for further development.

When technology is coupled with game- and play theory in an educational and learning perspective the way that different forms of modality and interactivity are applied through choice and combination of expression systems and communication patterns is central. In connection with educational theory, theories of social semiotics, communication and modalities become topical. In this approach communication is seen as dynamic processes in which the communication processes take place in a socially and culturally constructed world (Kress 1993, Kress & van Leeuwen 2001). As regards modalities, the visual aspect does not take up such a strong position in the social semiotic theory for which reason visual culture theory will be drawn upon (Buhl 2005).

In the project the learners are children and adolescents. In the school children and adolescents are positioned as students. As a educational design category, they are often in a curriculum- and educational material perspective considered from a developmental-psychological approach in which Piaget's developmental phases have largely constituted the model of how educational- and learning processes are organised. The cognitive basis of these theories as regards learning will be involved along with theories of social learning, theories about gender and recent culture-theoretical and sociological theories about children's and adolescents' use of digital media. We shall specifically draw on theories about children's and adolescents' games, play, communication (Drotner, 2001, Livingstone & Moria 2001, Jessen 2001, Sørensen, Jessen &Olesen 2002, Sørensen & Olesen 2000, Sørensen, Olesen &Audon 2001, Tingstad 2003, Buckingham 2005) and the motivation factors associated with children's use of digital media (Sørensen 2002).

From an educational design perspective the educational- and learning potential of technology-based games, the students and what is learned plays a central role. Bolter uses the concept "remediation" (Bolter 1999) about the process where the digital media absorb earlier media which in different ways are transformed and acquire new forms of manifestation. On an educational design plan in relation to games this entails an educational innovation process that requires a re-thinking of educational design and most likely also a development of the educational design categories and their mutual relations.

FORMAL AND INFORMAL LEARNING

In definitions of learning change and difference are central concepts. This applies in particular when it is a question of learning as a result of learning processes in which learning is seen as a difference or change in relation to what has been learned in the past (Illeris 2006). Learning can also be perceived as a cognitive, a psycho-dynamic and a social, societal process (Illeris 2001). The cognitive and the psycho-dynamic are about processes that take place in the individual. The social, societal process is about direct or indirect inter-human interplay and the underlying societal level that impacts on the inter-human processes. The split between result and process is central in the project, since we focus on learning both as a result and a process. When it comes to children and adolescents' learning it is central to distinguish between formal and informal learning. In a recent review-article Selfton-Green has discussed different definitions of formal and informal learning which are often linked to the context of learning (Selfton-Green 2006). One can thus say that it is not a case of formal and informal learning but of formal and informal contexts of learning. However, we choose to maintain the concepts formal and informal learning and employ a play-cultural approach to these concepts [i]. Formal learning is for children and adolescents mainly linked to school/educational centres and learning is a goal for the activities that take place. The informal learning is characterised by taking place primarily outside school and is a *means* of acquiring capability and knowledge in relation to activities such as being able to play computer games, chat and create blogs. In order to play the children have to learn something (Jessen 2001, Sørensen & Audon 2004). Thus learning becomes a

precondition for and an integrated part of children's and adolescents' play activities.

In relation to the educational design of serious games informal learning is an important element to be integrated, as it involves play and therefore gaming is supplied with the motivating factors of play. Furthermore, we shall argue that it is important that both individual learning and social learning is reflected in the design as we regard the social learning processes as preconditions for the individual ones, as something that contributes to the individual learning process, as well as a learning process where the individual contributes to the construction of the social learning process.

GAMES IN A LANGUAGE LEARNING CONTEXT

In relation to language teaching and learning we understand games as conceptual models (or "doctrines", Gee 2005) that work across formal and informal contexts of learning. In language teaching games have often been used to stimulate motivation and authentic communicative practices, as games have been conceptualised as the "the fun factor" of language learning (Warschauer and Healey 1998, 60). In addition to this, games have been understood as a serious and pervasive element for providing stimulation and simulation in instructional settings. In informal settings, games have often been associated with the leisure activities of children as gaming is a central activity in children's offschool practices with languages. In this context, languages (specifically English) have often had to be learned and used by children in order to engage and participate in games.

When children play games in online environments they often emphasize interactivity and individual action as significant practices. *Interactivity* is here understood in a wide perspective as communication patterns in conversation, consultation, transmission and registration (Jensen 2000, 201-203)[ii] . These understandings to some extent coincide with communicative and socio-cognitive approaches to language and language learning, i.e. the prioritisation of negotiation and communicative ability (Warschauer & Kern 2000, Warschauer & Healey 1998) . In off school contexts, children thus generally understand and use languages as *a means* for communication, information gathering and gaming, whereas in schools the understanding and use of languages is often understood to be *a goal* of the activities, i.e. an aspect of an intended learning process in which language may be understood as an internal system to be learned (Sørensen & Audon 2004, Warschauer 2004). As argued by Warschauer (2004), interactivity and the fulfilment of a meaningful purpose for a real audience is a significant issue in Internet activities as "the purpose of studying English…becomes not just to acquire it as an internal system but to be able to use English to have a real impact on the world" (2004, 23).

The role of languages in children's off school activities should be understood in the context of what Warschauer and Kern have described as paradigmatic shifts in the history of language teaching with technologies. Warschauer and Kern (2000) argue that in the past 40 years language instruction has generally existed in a field of continuous change where "the focus of instruction has broadened from the teaching of discrete grammatical structures to the fostering of communicative ability" (Warschauer & Kern 2000, 1). The consequences of these instructional shifts are among other things that recent trends in language education generally prioritise communication and negotiation of meaning over structural language drills. In continuation of this, Kern and Warschauer term the shifts in approaches to language instruction *structural*, *cognitive* and *sociocognitive* (Warschauer and Kern 2000, 3). The transformation of these three phases of technology based language teaching and learning may be summed up in the claim that the role of technology in language learning has been moving away from an association with drills, grammatical explanations and translation tests, into more communicative based contexts where task-based, project-based and content-based approaches are integrated with technologies. As argued by Kern and Warschauer (2000, 1) language teaching has in this process not only become considerably more complex, but also "more exciting" (ibid.)

If games are generally seen as a framework for providing a meaningful context for language acquisition then games should be understood as significant models for the design of educational material for language teaching and learning. Games may provide the opportunity for going beyond 'manipulative' approaches (Dunkel 1991) as games are not necessarily about memorizing or providing correct answers, but rather about the performance of skills within a specific system of thinking and acting. As argued by Kossuth (in Underwood 1987) in games "the user does not think about the language in use, but only about the action and where it might lead next" (217). In this sense games may be a lever for the transformation of drill-based to context-based acquisition. In addition to this, performance may be increased by game-based activity, as learners may "voluntarily read more than they would if assigned a linear text, and their comprehension can be expected to increase with each repetition" (ibid.).

These approaches to and hypotheses about game-based language learning – though not yet contextualised – may be supported by James Paul Gee's claim that "Since fruitful thinking involves building simulations in our heads that prepare us for action, thinking is itself somewhat like a

video game, given that video games are external simulations" (2005, 220) . According to Gee the educational potential of (video)games is associated with the experience of deep expertise – an experience that is often not offered learners in school, as schools are generally focused on testing and competence rather than performance. Schools are intent on the study of knowledge as factual knowledge, however, "all the facts and information the learner is studying would make a lot more sense if the learner had had any opportunities to see how they applied to the world of action and experience" (Gee 2005, 221). In this sense players may experience 'deep expertise' in the embodied act of thinking, acting, valuing and deciding like a professional. Games may therefore provide a context for apprenticeship in the use of language in 'protected' and 'semi-authentic' settings.

GAMES IN LANGUAGE LEARNING – EMPIRICAL EXAMPLES

In the project *Serious Games on a Global Market* the game-based course *Mingoville* will be a significant prototype for the exploration and development of educational design that aims at innovation. This research based work includes predicting the potential of serious games globally as well as generating theoretical concepts and practical methods for innovative product development.

In the case of *Mingoville*, exploration and development will build on the knowledge and experience acquired in the projects *Children Growing up with Interactive Media* (1997-2002) as well as *LAB, Language Across Borders* (2002-2004). The research project *Children Growing up with Interactive Media* sought - through the study of 7 to 15-year-old children's use of digital media at home, in recreation centres, at school, in computer cafés and in libraries - to identify the practice forms employed and valued by children (Sørensen 2002). The focus of the project was on the one hand to observe and interview children with different demographic characteristics, on the other hand to study children with the common trait that they used interactive media more than the average group of children. The purpose of this double perspective was to consider the future perspectives of children's interaction with digital media. The project *Language Across Borders*[iii] (LAB) focused on developing a web- and games-based learning and teaching website for the languages English, German, and French in grades 4 through 10 (pupils aged approx. 10 to 17 years). LAB also aimed at giving a research based response to the question of how children's digitally based off school experiences with languages and games might be used as a resource in formal language learning contexts.

Two main conclusions from the research project *Children growing up with interactive media – in a future perspective* that affected the game-based design of LAB were: 1) children live in both physical and virtual spaces, and 2) children mainly make use of the digital media in their leisure time and they learn to use digital media primarily from other children and through their own experiments. The virtual spaces seem to be of decisive importance for changes in children's everyday lives, as children have gained access to new and qualitatively different spaces of action. Experience and play thus increasingly relate to e.g. chat and games on the Internet where communication is more closely connected to virtual spaces such as different kinds of chat rooms, email, and communication in relation to online games, discussion forums and news groups where children establish new social relations. In addition to this children develop their competences in the use of digital media through social processes with other children of all ages and perhaps also adults in their leisure time, and through experimenting with the Internet and programmes of particular interest. A recently published quantitative study of 9 to 16-year-old Northern Europeans' use of computers and the Internet (SAFT: http://www.medieraadet.dk) for instance shows that when children learn to use the Internet, their sources of learning are, in order of priority, their friends, their parents, their own experiments and finally, their teachers.

In addition to the interactivity perspective mentioned above, children typically focus on action, navigation and interaction in their use of digital media. These perspectives are significant for the motivation and learning of game activity. As an example, it is important for children to be able to act in games when the completion of the game depends on their actions, strategies, choices and decisions. Interactivity is an underlying theme when the children speak of computer games and chat. The fact that children like to be in control and make decisions is made clear in many interviews and discussions with children in the research project. In computer games, the control of characters or avatars for example provides children with an influence on the life of the avatars and on the universe in which they exist. This influence is associated with performative understandings of identity, as described by for instance Sherry Turkle (1984, 1995) and Judith Butler (1990,1999).

The goal of the web-based learning and teaching website for foreign languages, LAB (*Language Across Borders*), was to develop a production and communication website for children to use for school purposes and to provide them with an option of developing their linguistic competences with a focus on their written proficiency as well as their intercultural competences. Games were significantly involved in the conceptualisation and development of LAB,

as games were found to be central in the off school activities of children that involved written language production and communication. Inspired by the research project *Children growing up with interactive media – in a future perspective* and by Etienne Wenger's concept of learning in communities of practice (1998) the project identified and exploited the activities and forms of practice used by children in off school contexts. These digitally based off school practices were understood to provide the basis as well as the support for new learning and teaching environments in school. Gaming was essential for the educational design of this project as games were understood to be the key link between the mainly English based language production of children's off school activities and language acquisition in (semi-)formal contexts such as the LAB platform.

The LAB project took its point of departure in both the children's own culture, i.e. texts, expressions, productions, stories and particularly play, and in the social patterns of children. From a basic point of view, the website was designed for children. The educational design of the website was based on the concept of children's own production of learning activities - particularly games and quizzes - for other children. Interactivity, reification and agency were pivotal points for all activities. The activities were based on the individual and cooperative creative processes of children in an interactive process in relation to the website tools and designs. The participating children influenced the contents and design through their creative processes within the basic frames of the website design. In the creative processes, words and text production were primarily in a foreign language – German, French or English. Activities included were simple games such as Hangman and Odd man out as well as quizzes such as LAB'ardy, a variation of Jeopardy appropriated to the LAB platform. In addition to this, the writing of chain stories and participation in joke competitions were game related activities that motivated children for social and competitive language production in the digital platform. For older children the learning values of solving games like Hangman and Odd Man Out may not be high as is it not the most reflective processes of learning. But in relation to younger children and when this type of games are employed as production processes in written language learning the learning values can be regarded as effective for learning for instance vocabulary.

Children's interest in different forms of games with various aspects of competition were realized in three of the above mentioned games. The project development group formed to deal with pedagogical reflection in the project discussed competition as a phenomenon. The question was how to exploit and apply the potential of competition in a foreign language learning context. On the LAB website, the children constructed the competitions at the same time as they entered the game as players. Roger Calliois applies the concept Agon for the type of play that is based on

competition. Competition demands attention, training, persistence and the will to win from the player. Additionally, the winner is celebrated or the loser is degraded, depending on the nature of the game and the situation in which the game takes place (Callios 2001; Konzack 2003). Seen from the point of view of children's interest in competition, rethinking competition in relation to the pedagogical context is a highly relevant challenge, as attention, training, persistence and the will to win are important elements in many learning processes. At the same time, competition may be problematic in a pedagogical context because of the celebration and degradation aspects. Many games incorporate attention, training, persistence and the will to win in the activity concept and they also operate with the celebration aspect in a high score list connected to the games for the players to see who earned most points. The degradation aspect is generally not involved. However, it can be claimed that it is indirectly present to players who never appear on the high score list.

On basis of the research in LAB, other learning games and interviews with children on use of different computer games and different social software, focus has been on the children's satisfaction and experiences. This focus has led to the generation of a set of concepts which seem central in the development of learning games (Sørensen 2002):

- Challenges – to be confronted with a problem you have to solve
- Reification – to create, produce and make experiments
- Socialities – to communicate and take part in communities and social networks
- Achievements – to get acknowledgment and enjoy respect
- Pleasure – to interact in sensitive and pleasurable situations
- Exploration – to explore and act on basis of curiosity
- Self interpretation – to search and experiment identities

The project will explore these concepts and relate them to the prototype to be developed, i.e. Mingoville. The performative approaches to language learning inherent in children's use of games in informal, semi-formal and formal contexts of learning as described above will have a central role in developing, designing and assessing the game-based material for future language learning.

MINGOVILLE – A GAME-BASED COURSE FOR LANGUAGE TEACHING IN PRIMARY SCHOOL

Mingoville is – like LAB - based on the idea that children learn and are motivated by problem solving and game

activities rather than traditional skills-based and textbook based material focusing on reading, writing, spelling and listening. Mingoville therefore – as well as presenting itself as a 'serious game' - generally exploits the 'fun-factor' of gaming and is structured around themes and activities that cater to children's desire to explore, interact and play games. In this sense it taps into the informal learning activities of children – activities that involve language production and communication in online environments.

Mingoville is a web-based platform for language learning targeted at primary school learners (ages 9-10). The programme was introduced in Denmark in 2006 as "the world's most comprehensive English language course online for kids of all ages" (www.mingoville.dk). The course has been translated into 31 languages and is sold and marketed worldwide.

The Mingoville course contains 10 missions that take the learners through the following themes: The Family, Colours and Clothes, Numbers and Letters, Nature and Seasons, The Body, Food and Shop, Time and Travel, Animals, House and Furniture as well as Sports and Media. The missions are not only theme based but contain a number of activities that aim at for instance vocabulary training, spelling, and word recognition. "Stories" is thus an activity where children can listen to and create narratives. "Creative lab" is a laboratory where children can draw pictures or sing karaoke in English, and "Games" are serious games that involve for instance the construction of sentences and the recognition of words. One of the most popular interactive features of the course is currently the activity "Let's talk about you" where children are interviewed for Mingoville Times by one of the course characters. The interview is then published in the newspaper where parents and friends can read it.

Mingoville is based on a narrative concept built on the familiar world of the family. The characters of the game are citizens of the simulated world Mingoville – a city inhabited by flamingos. The narrative frame of the course invites the child to participate in an already well-known world in which the dominant language is English. English is the language used for listening to the characters, participating in their stories and their lives. English is in this sense learned through a model that is not unfamiliar to the child, but allows him or her to participate on a confident basis in a world that employs an unfamiliar language. The embodied experience of Mingoville is therefore not – as in games that contain a more implicit educational discourse – a novel world for the child, it is a simulation targeted at specific competences and curriculum goals. The educational goal orientation of the course is also built into its genre-reference: the world of the flamingos is a storybook world peopled with familiar objects from school – among them the textbook interface. The familiarity of objects in this simulated world thus includes characters from the context of the home (mothers, fathers, aunts and uncles, sisters and brothers), as well as games that are familiar to the children from school and off school contexts. In addition to this the interface of the course explicitly refers to school genres such as the textbook and the storybook. Competence is in this sense explicitly integrated into the performance of the course as competence in understanding the world of Mingoville is already present in the child through recognition of the familiar objects. In addition to this, the competence that the child needs to acquire – in this case language competence - is built into the course through the games and narratives of the setting. Finally, the course caters to and exploits the media competences of the children through tasks such as karaoke and "Let's talk about you". The designers of the game have thus explicitly referred to the digitally based off school activities of the children in their educational design of Mingoville, "we realised that they master modern technology, for instance mobiles and computers, quite well…a lot of the boys did not only have quite a large vocabulary in English, but also a good pronunciation that derived from different kinds of computer games such as Counter Strike. Both sexes were very interested in song contexts and music videos …" (p.27)

However, the familiarity of interfaces and functions in relation to children's in and off school experiences also raises the issue of educational innovation in the game-based design of Mingoville itself. In what way does the educational design of Mingoville represent a development of the educational design of game-based material for language teaching and learning, and to what extent does the conceptualisation of Mingoville rely on a remediation of textbook genres and educational games that do not necessarily support the active performance of the learner?

CONCLUSIONS

This paper has aimed to reflect on the theoretical issues involved in the development of game-based prototypes for language teaching and learning. The theoretical point of departure for these reflections has been on the one hand a broad definition of educational design in relation to serious games research that includes goals and content as well as practice levels, organisation levels and levels of theoretical reflection (Dale 1989, 2000) On the other hand the paper has thematised educational design in relation to formal and informal contexts of learning that involve children's perceptions of and activities in online game environments. Finally, the paper has outlined an empirically based analysis of children's interaction with digital media with a focus on the role of games across the apparent divides of formal and informal learning. From a serious games perspective the game related practices of children in off school contexts are pivotal points of interest for a consideration of how games may be transformed from drill-based educational material to contextualised simulations that involve fruitful thinking, real language interaction and student engagement. In this process games will have to be understood as conceptual

frameworks (or "doctrines") that both 'contain' knowledge and invite learners to participate in creating knowledge and performing expertise in protected linguistic environments.

The above described game-based concept for teaching languages in primary school – Mingoville – will serve as an example of how game-based prototypes for educational use can be assessed and developed with the aim of innovation. Mingoville is – in spite of its awareness of and reference to children's engagement in online game activities *off school* – to large extent based on game models that are school based and school initiated. In this sense it exists on a dialectical edge between existing ideas of game-based material for language learning and broader conceptions of the ways in which games are associated with and used in (language)learning. The challenge of developing this design will therefore not least consist of renegotiating the educational games genre in language learning through specifically the production and performance aspects of game material, i.e. the use of interactivity, collaboration and exploration based simulations that allow children to perform within their own categories of achievement. This renegotiation of form and content will involve a consideration of and reference to curriculum restraints as well as market factors that define the local and global significance of game-based material for language learning.

REFERENCES

1. Bolter, J.D.(1999). "Remediation and the Desire for Immediacy". Conference paper. *Conference Creativity & Comsumption*. University of Luton, 29-31 March.

2. Buckingham, D. (2005). *The media literacy of children and young people: A review of the research literature*. London: Ofcom.

3. Butler, Judith (1990/1999) *Gender Trouble. Feminism and the Subversion of Identity*. Routledge

4. Buhl, M (2005). "Visual Culture as a Strategic Approach to Art Production in Education". *International Journal of Education* Through Art, Vol1.

5. Callois, R. (1961). *Man, Play and Culture*. New York: The Free Press of Glencoe.

6. Dale, E.L. (1989). *Pedagogisk Profesjonalitet*. [Pedagogic Professionalism] Oslo: Gyldendal.

7. Dale, E.L. (2000). "Professionalisering og læring i organisationer" [Professionalism and Learning in Organisations] in: Andersen, P & Frederiksen, P (Red.): *Innovation, kompetence, læring*. [Innovation, Competence, Learning]. Frederiksberg: Dafolo.

8. Drotner, K. (2001). *Medier for fremtiden: børn, unge og det nye medielandskab*. [Media for the Future: Children, Aldolescents and the new Media Landscape]. København: Høst.

9. Dunkel, Patricia (1991) *Computer Assisted Language Learning and Testing* Newbury House

10. Gee, James Paul (2005) "Pleasure, Learning, Viedeo Games, and Life: the projective stance" *E-Learning* Vol 2, number 3

11. Him, H. & Hippe, E. (1997.) *Læring gennem oplevelse, forståelse og handling. En studiebog i didaktik*. [Learning through experience, understanding and action. A study book for educational design] København: Gyldendal Undervisning

12. Hopman, S. Riguarts, K. (Eds.) (1995). *Didaktik and/or Curriculum,*. Kiel:IPN.

13. Illeris, K. (2006). *Læring*. [Learning] Roskilde: Roskilde Universitetsforlag.

14. Jensen, J.F. (2000). Interactivity – Tracking a new Concept. In Meyer, P.A. (ed). Communication, Computer Media and the Internet : a Reader. Oxford: Oxford University Press.

15. Jessen, C. (2001*). Børn, leg og computerspil*. [Children, Play and Computer Games] Odense: Odense Universitets-forlag.

16. Kolb, D. (1984). *Experimental Learning – Experience as The Source of Learning and Development*. Englewood Cliffs: Prentice Hall.

17. Konzack, L. (2003). Edutainment: leg og lær med computermediet. [Edutainment: Play and Learn with the Computer Media] Aalborg: Aalborg Universitetsforlag.

18. Kossuth, Karen C. (1984) "Suggestions for Comprehension-Based Computer-Assisted Instruction in German" *Die Unterrichtspraxis* 17,1

19. Kress, G. (1993). *Communication and Culture*. Australia: New South Wales University Press.

20. Kress, G. & van Leeuwen (2001). *Multimodal Discourse. The Modes and Media of Contemporary Communication*. London: Cappelen.

21. Livingstone, S. Moria, B. (ed.) .(2001). *Children and their Changing Media Environment: A European Comparative Study*. New York: Erlbaun.

22. Nielsen, F. (1998). *Almen Musikdidaktik.* [The Educational Design of Music] København: Akademisk Forlag.

samme? [Are Educational Design and Curriculum the same Thing?] København: Danmarks Pædagogiske Universitet.

25. Selfton-Green, J. (2006). *Literature review in informal learning with technology outside school: A report for NESTA futurelab.* Bristol: NESTA Futurelab

26. Shetzer & Warschauer (1998) "An electronic literacy approach to network-based language learning" Warschauer & Kern (eds.), *Network-based Language Teaching: Concepts and Practice.* Cambridge UP

27. Sørensen, B.H. (2002). Børnenes nye læringsfærdigheder – didaktiske perspektiver. [Children's new Learning Skills – Educational Perspectives] Sørensen, B.H., Jessen, C. & Olesen, B.R. (Red.). *Børn på nettet. Kommunikation og læring.* [Children on the Internet. Communication and Learning]. København: Gads Forlag

28. Sørensen, B.H. & Olesen, B.R. (Red.). (2000). *Børn i en digital kultur. Forskningsperspektiver.* [Children in a Digital Culture. Research Perspectives]. København: Gads Forlag.

29. Sørensen, B.H.; Jessen, C. & Olesen, B.R.(red.) (2002). *Børn på nettet. Kommunikation og læring.* [Children on the Internet. Communication and Learning] København: Gads Forlag.

30. Sørensen, B.H.; Olesen, B.R. & Audon, L. (Red.). (2001). *Det hele kører parallelt. De nye medier i børns hverdagsliv.* [The new media in Children's Daily Life]. København: Gads Forlag.

31. Sørensen, B.H. & Audon, L. (2004). *Nye Læringsformer og rum – digitale medier i*

23. Piaget, J. (1954). *The Construction of Reality in the Child.* New York: Basic Books.

24. Schnack, C. (2000). *Er didaktik og Curriculum det*

vidensamfundets skole. Forskningsrapport. [New ways of learning and Spaces – digital media in the knowledge society] København: Danmarks Pædagogiske Universitet.

32. Tingstad, V. (2003). *Children's chat on the net: A study of social encounters in two Norwegian chat rooms.* Trondheim: Norges teknisk-naturvitenskabelige universitet.

33. Turkle, Sherry (1995) *Life on the screen : identity in the age of the internet.* Simon & Schuster

34. Turkle, Sherry (1984) *The second self : computers and human spirit.* Granada

35. Underwood, John H. (1987) "Artificial Intelligence and CALL" in *Modern Media in Foreign Language Education: Theory and Implementation.* National Textbook Company

36. Warschauer, Mark & Kern, Richard (2000) "Introduction" Warschauer & Kern (eds.), *Network-based Language Teaching: Concepts and Practice.* Cambridge UP

37. Warschauer, Mark (2004) "Technological change and the future of CALL" in Fotos & Browne (eds.) *New Perspectives on CALL for Second Language Classrooms* Lawrence Erlbaum Ass.

38. Wenger, E. (1998). *Communities of Practice. Learning, Meaning, and Identity.* Cambridge: Cambridge University - Press.

39. Wenger, E.;,McDermott, R. & Snyder, W.M. (2002). *Cultivating Communities of Practice: A guide to Managing Knowledge.* Boston: Harvard Business School Publishing.

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[i] In Scandinavia the research field of play culture understand play as something it itself, something children do to be in a good situation (Jessen 2001) .

[ii] The elaboration of these concepts will be too extensive a task for this paper, which is why Jensen 2000 is used as reference.

[iii] www.lab.emu.dk