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LEARNING GAMES AND CHILDREN'S USER EXPERIENCE - THE EFFECTS OF CONTEXT

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Tutkimuksen tarkoituksena oli tutkia, onko lasten käyttäjäkokemuksissa eroja heidän pelatessa digitaalista peliä kahdessa eri kontekstissa. Käyttäjäkokemuksia selvitettiin myös tarkastelemalla pelaajien flow kokemuksia. Tutkimuksessa käytettiin MinecraftEdu peliä, joka on TeacherGaming LLC yrityksen tekemä virallinen opetusversio Minecraft pelistä. Pelaamisen kontekstit, jossa peliä pelattiin, olivat kouluaika ja vapaa-aika. Erilaisista konteksteista johtuen sekä ulkoiset tekijät että myös sisäiset tekijät kuten, päämäärät, tavoitteet, ja motivaatio vaihtelevat. Tutkimuksessa käytetyt metodit koostuivat ääneen ajattelun, observoinnin ja kyselyjen yhdistelmistä.

Kontekstilla näytti olevan vaikutusta käyttäjäkokemukseen, vaikka vaikutuksia flow kokemukseen ei löytynyt. Yleisesti ottaen päämäärän asettaminen oli selkeästi vaikuttavin kategoria molempien kontekstien pelikokemuksissa. Käyttäjäkokemuksen erona oli se, että kouluaikana pelikokemuksissa oli enemmän variaatiota kuin vapaa-ajan peli sessioissa. Tähän saattoi vaikuttaa se, että kouluajalla esiintyi erilaisia ulkoisia tekijöitä kuin vapaa-ajalla. Ympäristö, välineet ja ihmissuhteet olivat erilaisia näissä kahdessa kontekstissa.

Vaikka päämäärän asettaminen oli pääasiallinen kategoria käyttäjäkokemuksessa myös vapaa-ajalla, pohdiskeleva pelityyli oli vaikuttavampi kategoria vapaa-ajalla päämäärän asettamisen tyylin kustannuksella. Pohdiskelevassa pelityylissä pelaaja miettii muun muassa pelin ominaisuuksia ja aiempia pelikokemuksia. Kontekstin vaikutukset flown kokemiseen eivät olleet selviä, mutta flow kokemuksen aste näyttää olevan samalla henkilöllä samansuuntainen sekä koulu ajalla että vapaa-ajalla. Pelijärjestykseen liittyvä ensivaikutelma efekti ei vaikuttanut pelikokemukseen. Toisella pelikerralla tuli paremmat flow kokemuksen pisteet kuin ensimmäisellä pelikerralla riippumatta siitä, aloitettiinko pelaaminen koulussa vai vapaa-ajalla. Tämä tarkoittaa sitä, että flow kokemukseen vaikutti ennemminkin tuttuus kuin uutuuden viehätys kontekstista riippumatta.

Asiasanat: konteksti, pelikokemus, käyttäjäkokemus, peli, oppimispeli, flow

ABSTRACT

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The purpose of this thesis was to study whether or not there are differences in user experiences of children when playing digital games in two different contexts. User experiences were studied also by observing the flow experiences of the players. The game used in this study is MinecraftEdu, which a modification is made for educational purposes from Minecraft by TeacherGaming LLC. The variation of contexts is based on playing the same game in free time and during school time. Not only do the external factors vary but also the goals, tasks, and motivations because of the nature of these two contexts. The methods used are a combination of thinking aloud, co-operative observation and questionnaires.

The context did seem to have an effect on the user experience even though the effects on flow experience were not found. Generally the goal making was clearly the most influential category in the play experiences of both contexts. The difference in user experience was that there is more variation in play experience during school time play experience than during free time play sessions. This might occur because of the influence of different external features existing during school time when comparing to the free time context. Environment, equipment and relations are different in these two contexts.

Even though the goal making category was a major element of user experience also during free time play experiences, the pondering play style was more influential during free time and at the expense of goal making. In the pondering style player is thinking the features of the game or the earlier play experiences. It is not clear if the differences in context have an effect on the flow experience, but the same persons are getting similar flow experiences scores both during school and free time play experience. The game experience order does not seem to create the first effect acting on the play experiences in this study. Second trials received better flow scores for both those who started in school and in free time. This means that the flow experience was affected merely by the familiarity than first impression despite of the context.

Keywords: context, play experience, user experience, game, learning-based game, flow

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1 Introduction

The purpose of this thesis is to study whether or not there are differences in user experiences of children when playing digital learning game in two different contexts. The game used in this study is MinecraftEdu, which a modification is made for educational purposes from Minecraft by TeacherGaming LLC. The variation of contexts is based on playing the same game in free time and during school time. Not only do the external factors vary but also the goals, tasks, and motivations, because of the nature of these two contexts.

So why study the playing of a digital game? Not everyone likes playing games, and even those who do, do not necessarily like the same games. However, games are widely in use and people are using a lot of time, actions and effort in playing games, and feeling immersion and flow during play. According to Mäyrä's and Ermi's research (2014, 9), even 73.6% of respondents play digital games. While at the same time the use of learning - based games seems to be quite minimal in general as 4.7 % of respondents have played them (Mäyrä & Ermi, 2014, 9, 13).

Based on my own experience, I have noticed that children may want to play some games but not others and especially not the educational ones. Whether or not this notion is really true remains unsolved, but it has influenced the study regarding the possible differences among user experiences in these two different contexts – free time and school time. These contexts do not vary only because of obvious external factors. The internal aspects like different tasks, goals and motivations are different in school time and in free time. All in all this thesis may give new insights for the gaming industry in general, but especially for educational games.

Flow is said to be a powerful tool in adding motivation and is reached often in games. Thus, it would be beneficial for children for playing educational games to get that flow state too. Through increased motivation the attitude to the (even among the routine like) learning itself might grow. The flow experience might be the reason why people play in the first place (Salen & Zimmerman, 2004, 338). Even though flow state is claimed to be useful for game-based learning, the empirical evidence for this relationship is mainly derived from studies that have not

been accompanied with games (Pavlas, 2010, 4). In this thesis the focus is on the user experience not in effectiveness of playing games to learning. Still the information of connection between user experience and flow in games in different contexts may add something for the picture of effectiveness of games too.

Indeed there are plenty of theories in education which give notions about the reasons for successful learning. To learn effectively one should understand the phenomenon and not only remember by rote. Learning takes time even among the gifted ones, and motivation, relevant feedback and pertinent challenges are a few other valuable concepts needed (Bransford, 2000, 55 - 60, 155). It also seems that both negative and positive emotions effect learning (Efklides & Petkaki, 2005). Whitton (2010, 41) thinks that fun is not the necessary issue in learning as long as there is something that creates engagement (Whitton, 2010, 41). Then again the flow theory indicates that people may be willing to put a lot of work and effort into the certain tasks where they gain pleasure from the activity itself. In these situations people are merging in to the action, feeling a sense of control and altered sense of time (Csikszentmihalyi, 2005; Csikszentmihalyi, Abuhamdeb, & Nakamura, 2005).

The main research question is: how do user experiences of children differ when MinecraftEdu is played during school time and when MinecraftEdu is played during free time. It is also interesting to find out the potential reasons behind the any possible existing differences. In this study the user experience is about the play experience, so both of these terms are used for describing user experience received from the playing game. The methods used here are a combination of thinking aloud, co-operative observation and questionnaires.

In the beginning of the thesis the flow theory and related notion of immersion and gameflow are introduced as they seem to be a relevant framework when operating with games. The context is studied especially from the perspective of digital games and flow experience. The third chapter presents user experience and games, which are the basic concepts of this thesis. This is followed by the fourth chapter, where the research methods and research process are presented. In the results chapter the analysis of the data as well as the results are introduced. In the end of the thesis there is discussion about this study and its results, as well as the conclusion.

2 Flow, immersion and context

In the beginning of this chapter the flow theory is introduced. Also, the related concepts of immersion and gameflow are presented shortly. The context is introduces especially in relation to flow experience while at the end of the chapter some notions of the flow measurement are given. In the end of the chapter some relation between flow and user experience is introduced.

2.1 Flow

Flow is the optimal form of enjoyment, which has been described very similarly regardless of the culture, age or social status or the activities under depiction (Csikszentmihalyi, 1990, 48). The flow state is a subjective experience characterized by the merging of action, increased focus, effortless involvement and a lack of sense of time or self-consciousness. For existing flow there seems to be the need for certain conditions like a clear set of goals, balance between perceived skills and challenges as well as clear and immediate feedback (Csikszentmihalyi et al., 2005, 600 - 602). Like the self-feeding circle, flow changes the self by making it more complex. This growth of the self adds to flow related activities. As a result, flow is a magnet for learning and leading to personal growth. (Csikszentmihalyi, 1990, 32 - 33, 74) Also, flow can be seen as a motivating force for excellence (Engeser & Rheinberg, 2008).

Csikszentmihalyi (1990, 74), the creator of the flow concept was first describing the flow state through the flow channel model, where flow was experienced when skills and challenges were in balance, evolving among the development of the performance of the activity. Boredom and anxiety were the feelings which might exist if the skills and challenges are not in the balance (Csikszentmihalyi, 1990, 74). Later the model was upgraded and now flow is described as being experienced when perceived challenges and skills are above the actor's average levels. If they are below boredom, apathy, worry or anxiety are experienced. The intensity of flow experience is increased by the distance of the actor's average level of challenge and skills. Besides the flow experience one can feel arousal, control or relaxation. (Csikszentmihalyi & Nakamura, 2005, 95). A recent model is shown in figure 1 (adopted from Csikszentmihalyui & Nakamura, 2005).

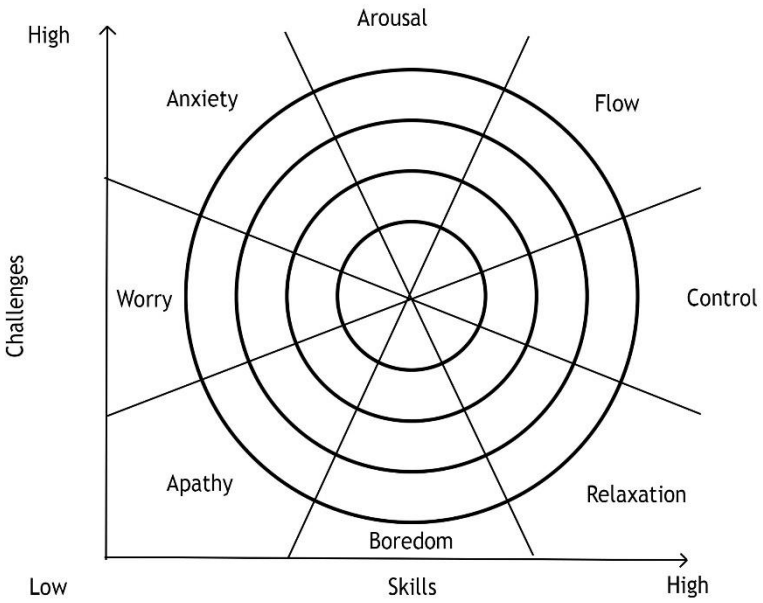

FIGURE 1 The recent model of Flow model

One recognized problem of the flow model is that the model does not make any distinction between different kinds of flows or with engagement. Another thing is that the continuous flow state must or can exist on a moment to moment basis (Draper, 1999, 119). It is also possible that the flow model is usable only under certain circumstances, during certain kinds of activities, or is easier to achieve for some people than others (Engeser & Rheinberg, 2008). Furthermore, there are other unsolved questions such as what makes flow happen, why some interfaces or environments are better at creating flow than others, and what methods can be used when measuring flow (Finneran & Zhang, 2005, 83).

Even though the practical consequences of the flow experiences are clear, important, and promising (Finneran & Zhang, 2005, 83) there are also ambiguities in the conceptualization of flow constructs, and inconsistency in the flow models (Finneran & Zhang, 2003, 2). Because of this, Finneran and Zhang (2003, 9) have re-conceptualised the flow model to consider the uniqueness of the computer-mediated environments. This model focuses on flow antecedents and identifies the importance of separating the task from the artefact. The model contains person (P), artefact (A), and task (T), as well as the interactions of these. (Finneran & Zhang, 2003, 3)

According this PAT model person is more likely to experience flow if:

- The person has traits of an autotelic nature and high exploratory behaviour, playfulness and absorption.
- The person's current state is conducive to absorption, time distortion, and loss of self-consciousness.
- The artefact has certain characteristics leading to telepresence, such as vividness and responsiveness.

- The task is more goal-oriented, autonomous, enables more variety, and is at the appropriate level of complexity.
- There is a clear fit between task and the artefact.
- The person has clear task goals, a balance between challenge and the skills of the task, a sense of control of doing the task, and adequate feedback on the task.
- The person has high perceived ease of use (PEOU) of the artefact
- The person experiences more likely flow when the artefact supporting the tasks has high PEOU, or is transparent. With less complex tasks the person experiences more likely flow, if person will perceive the artefact as having a high challenge.

(Finneran & Zhang, 2003, 12 - 23)

Salen and Zimmerman (2004, 338) as well as Pavlas (2014, 14) also point out that the definition of flow includes both the necessary conditions of flow as well as its outcomes (Pavlas, 2010, 14; Salen & Zimmerman, 2004, 338). Flow studies seem to suggest flow antecedents, flow experience, and flow consequences existing in three stages in the flow framework (Finneran & Zhang, 2005, 88). In order to recognise the flow experience, one can mainly study the outcomes and consequences of flow. If one wants to add the possibility of flow, one should work with the conditions of flow.

2.2 Immersion in games and gameflow

There are also other terms besides flow when trying to capture the enjoyment or presence of human life, and one of them is immersion. Immersion is often used in the gaming domain to refer to the degree of involvement or engagement one experiences with a game (IJsselsteijn, De Kort, Poels, Jurgelionis, & Bellotti, 2007). Ermi and Mäyrä (2005, 7-8) have divided immersion into three sections, which are sensory immersion, challenge-based immersion and imaginative immersion. Sensory immersion is connected to the audio-visual execution of games. Challenge-based immersion is achievable when there is a satisfying balance between challenges and abilities. In imaginative immersion one is absorbed by the characters and story elements of the game (Ermi & Mäyrä, 2005, 7 - 8). There seems to be a close connection between challenge-based immersion and flow experience (Nacke & Lindley, 2008, 82). Yet, immersion might be more fleeting by nature than flow (Brown & Cairns, 2004). Flow describes a level of complete involvement and immersion involves a loss of sense of context, so one could see immersion also as a precondition for flow (Nacke & Lindley, 2008, 82).

In computer-mediated environments flow theory has been studied in positive user experiences such as increased exploratory behaviour, communication,

learning, positive affect, and computer use (Finneran & Zhang, 2003, 1). The original flow model is used commonly for describing games and gameplay experience (Nacke & Lindley, 2008, 82). According to Salen and Zimmerman (2004, 338) there are clear parallels between flow component and elements of games. Games are one of the best kinds of activities to produce flow (Salen & Zimmerman, 2004, 332).

Flow is one way to understand the pleasure that keeps players wanting to play and stay playing the game (Salen & Zimmerman, 2004, 338). Digital games provide opportunities for flow-like experiences because in the games players end up acting to the limits of their skills, the feedback given to the players is immediate, and the activity of playing a game is a goal in itself (Ermi & Mäyrä, 2005, 3). On the other hand, as the digital games flow-like phenomena seems to be in momentary experiences, this might indicate that they are something different to flow as traditionally conceived. (Ermi & Mäyrä, 2005, 5)

Sweetser and Wyeth (2005) have formed a concise GameFlow model of enjoyment in games, which involves several game heuristics from literature and is organised through flow theory. The heuristics in the games literature closely overlap with the elements of flow. In this GameFlow model there are eight elements: concentration, challenge, skills, control, clears goals, feedback, immersion, and social interaction. Social interaction is presented in the literature on user-experience in games, but is not mapping with flow elements. People play games to interact with other people even though they do not like the game or games in general. All of the elements are not as suitable for some play genres as for others. Additionally, there is a need for future investigation with GameFlow elements, and in differing play genres. (Sweetser & Wyeth, 2005)

Also Järvinen, Heliö and Mäyrä (2002, 22) mention the term gameflow or game flow framework. They used the term in order to gain an understanding of what constitutes a satisfying gameplay experience. In game discourse, flow is described as being in the zone, and preconditions like the structure and tempo of the game, aesthetics, enjoyment of images, and sound, as well as the consistency of the game world may add to the flow experience (Järvinen, Heliö, & Mäyrä, 2002, 20, 22). Usability and flow can be merged with the notion of playability (Järvinen et al., 2002, 12).

Whitton (2010, 42) suggests that flow theory is very useful when defining engagement, and that engagement is more important for game-based learning than fun (Whitton, 2010, 42). But then again fun, is also described as a characteristic, which transforms serious gaming from low-fidelity simulation and learning environments into full fledged gaming (Pavlas, 2010, 7). Games can be defined autotelic, which means that participation in the activity counts in its own right. There are always both intrinsic and extrinsic reasons to play (Salen & Zimmerman, 2004, 332). Games motivate many players and people voluntarily take part for no other reason than to play a game (Whitton, 2014, 69). These aspects are also the ones recognized by the flow state. The flow phenomenon seems to be related to games, thus later on games are explained in more detail.

2.3 Context in digital games and in flow experience

In this thesis the user experience and flow is studied in two different contexts. A context is described as a culturally and historically situated place and time. It is the world as grasped through interaction and the most immediate frame of reference for jointly engaged actors. Contexts are formed by individuals, tools, resources, intentions and ideas in a particular setting and time. They are fluctuating, dynamic and constantly reconstructing themselves within the activity. In the realm of research the context can be differentiated between the local context and the larger context. Local context is where research is conducted and the large context is that in which the local context is embedded. When considering children in a context one notes that they do not have much control over the context as the adults make most decisions for them. One can even say that young children are more context dependent and context vulnerable than older children and adults. (Graue & Walsh, 1998, 9 - 12)

The computer-mediated environments (CMEs) present a unique context in flow experience and they add a level of intricacy to a person's activity.(Finneran & Zhang, 2003) For example when playing mobile games the effect of the context can be even more influencing one. Playing a game in certain (for example boring) environments makes users happy despite of the playability of the game itself. The use context influences the formation of peoples' perceptions of all aspects of mobile games, including perceived enjoyment among other aspects. Players' feelings are conditional and based on the special consideration of mobile game usage in certain use contexts. (Liu & Li, 2011, 896)

The social context of game settings influences the player's experience and engagement. The presence of others and moreover their ability to monitor the player's actions, performance and emotions shape the interpersonal dynamics and social mechanisms at play. (De Kort, IJsselsteijn, & Gajadhar, 2007) When looking for flow descriptions like mental absorption, a trance like state or the loss of awareness of others one may see social interactions and experiences of flow representing potentially conflicting mechanisms of game enjoyment. Actually playing games with others adds to game experience. Social contexts effects on emotion are largely determined by characteristics of a situation, i.e., the physical presence of others, their possibilities of communication, opportunities for monitoring performance, the role of the others, and their relationship. (De Kort et al., 2007)

In Partala's and Kallinen's research context showed some differences for most satisfying and unsatisfying user experiences. The most satisfying experiences were more often related to first-time usage, whereas for the most unsatisfying experiences the participants reported a longer period of usage before the experience. These results indicate the importance of novelty and surprise effects. The results also suggest that most unsatisfying experiences may typically occur in a more hurried context when compared to most satisfying user experiences. In addition, the clear differences in the ratings of technical and usability problems

between the most satisfying and most unsatisfying user experiences are relatively valid when thinking about user experience. (Partala & Kallinen, 2012, 31)

2.4 Measuring flow

The main research method for measuring flow experience has remained the same since its inception in the 1970s, although the technology has changed (Hektner, Schmidt, & Csikszentmihalyi, 2007, 3). This method is called the experience sampling method (ESM) and via this method information is collected both from the context and content of the daily life of individuals. The distinctive feature of ESM is its ability to capture daily life as it is perceived from one moment to the next. Individuals answer questions at several random points and questions generally deal with physical and social context, activities, thoughts, feelings, as well as cognitive and motivational self-appraisals. (Hektner et al., 2007, 6)

This experience sampling method can be useful for measuring both the experience of flow and the conditions necessary for flow (Hektner et al., 2007, 93). The history of using ESM for measuring the conditions of flow is long, however, the history of measuring the experience of flow is not. (Hektner et al., 2007, 96) The experience of the flow is operationalised with the sum of three variables, which typically are concentration, enjoyment, and interest or excitement. Nevertheless, there are no strict rules about these combinations (Hektner et al., 2007, 96). Indeed, the content of flow has been defined and operationalised differently in many studies (Koufaris, 2002). For example, some studies measure flow by estimating the subject's sense of control, focused attention, curiosity, and intrinsic interest, while others estimate enjoyment and concentration (Finneran & Zhang, 2005, 94).

Also, surveys have been used when studying flow. Typically these surveys use questionnaires, in which the respondents have evaluated their experiences through Likert-type scales (Finneran & Zhang, 2005, 96). This kind of short form has been also used for measuring students' flow in educational games by Shernoff at al. According to them (2014) research players are motivated to learn within digital games because it is clear that knowledge is powerful. Game designers are using engaging techniques to get players to learn the game. These techniques are closely related to the principles and theories of learning such as constructionism, inquiry-based learning, and anchored instruction. (Shernoff et al., 2014) At the same time learning and problem solving make the games fun (Koster, 2005, 40).

In that study the questionnaire was conceptualised as the simultaneous occurrence of high concentration, interest and enjoyment based on flow theory, and as those components which were relate to deep engagement in learning (Shernoff, Hamari, & Rowe, 2014). Later in chapter methods this questionnaire is presented more precisely as it is used in this thesis.

2.5 Connection between flow experience and user experience

Finneran and Zhang (2003, 9) have re-conceptualised the flow model, which focuses on the flow antecedents and identifies the importance of separating the task from the artefact. The model contains person (P), artefact (A), and task (T), as well as the interactions of these. (Finneran & Zhang, 2003, 3). Quite similarly Kiili has described user experience by using three main elements: users, an artefact and a task. User experience occurs from the relationship between these elements in the certain context of use (Kiili et al., 2012, 80). This is also shown in the table 4.

User experience model by Kiili	**Flow model by Finneran & Zhang**
User (U)	Person (P)
An artefact (A)	An artefact (A)
Task (T)	Task (T)
Relationship between UAT	Interaction of PAT

TABLE 1 Two models of the user experience and flow experience

When looking these models, there seems to be connection in description of flow and user experience. In this thesis the flow experience is seen as a part of the user experience, and herby flow phenomena of students is also studied. All in all, games are supposed to teach players and be pleasurable despite of the purpose of the game. Still the context of the playing the game might affect user experience, which can be described through the play experience and the possible flow experience. In next chapter concentration is on the user experience and digital games.

3 User experience and games

Two key features of this thesis are both user experience and games. This chapter presents these elements more specifically, especially from the points of view of flow and learning.

3.1 User experience

In the realm of human-computer interaction (HCI), user experience (UX) has been widely embraced and extensively used even though it does not have a unified and consistent definition (Law, Roto, Hassenzahl, Vermeeren, & Kort, 2009, 719). On the other hand, this can be seen as quite natural phenomenon as the definition of different concepts is not an easy task (Thagard, 1996, 60 - 61). One can see several reasons for the lack of a universal definition of UX. First of all UX is connected to a large amount of different concepts including many kinds of variables. Second, the units of analysis are very malleable, ranging from single aspect of individual user to the all aspects of multiple-users. Additionally, the theoretical models are diverse (Law et al., 2009, 719)

The clear description of UX is needed as it would help communicate about it to the people unfamiliar with and to teach the basics of UX. It would also advance UX as a research field, ground the practical work of the UX, and clarify perspectives on UX amongst scholars and practitioners (Roto, Law, Vermeeren, & Hoonhout, 2011, 4). In many user experience definitions one often sees something, which is dynamic, depending on the context and subjective. UX has been described as an individual experience, which arises from the interaction with the product, system, service or object. It is individual experience, which emanates from person's interaction with user interface. (Law et al., 2009, 719, 727). Even though UX is unique to an individual, it is not about just an individual using a system in isolation. User experience can refer either an individual or a group of people encountering the system together. (Roto, Law, Vermeeren, & Hoonhout, 2011, 6 - 7).

UX has been also described consisted from three main elements: users, an artefact and a task. UX occurs from the relationship between these elements in certain context of use (Kiili, de Freitas, Arnab, & Lainema, 2012, 80). There is also other kind of facets used when describing UX. The facet addressing human needs beyond the instrumental in one and another is affective and emotional aspects of interaction. Third facet deals with nature of experiment. (Hassenzahl & Tractinsky, 2006, 92) UX involves holistic view of user's interaction. It emphases on positive attributes of users' interaction and the situational and dynamic aspect of using product as well as the importance of context. UX views and models are multidimensional including task orientation as well as symbolic and aesthetics

values. (Bargas-Avila & Hornbæk, 2011, 2) For user the experience is continuous, and environment, devises and life all interact on one another. (Kuniavsky, 2003, 43)

According to ISO (2014), user experience is defined as users' perceptions and responses that result from use or the anticipated use of a product, system or service. It includes for example users' emotions, beliefs and behaviours which are in relation to the system, object or service. UX can be seen as consequence of several features of a system, as well as users' own internal and physical states deriving from prior experience. ISO 2014 states the connection between usability and UX through the perspective of users' personal goals. (ISO/IEC 25063:2014).

The most often used key factors of UX are affects and aesthetics (Bargas-Avila & Hornbæk, 2011, 8). An affect is said to be related to motivation and engagement, and is natural to find in connection with affect and learning. (Pavlas, 2010, 44). Although the context of user experience is also often named as one of the key factors, it has been rarely researched (Bargas-Avila & Hornbæk, 2011, 1). One can measure or study user experience, for example, by searching users' experiences between two dimensions: competence and frustration (Saariluoma & Jokinen, 2014, 315). It is even possible to encompass UX measures within a 3-component model of usability (Bevan, 2009). Scholars have also created new factors. Without careful reasoning this can be seen as problematic, because it may add large amounts of words describing the same phenomena (Bargas-Avila & Hornbæk, 2011, 8).

Especially during early stages of its development, user experience was often denoted as a synonym for interaction, usability, or user-centred design (Bargas-Avila & Hornbæk, 2011, 1). UX and usability researchers' relationships are also seen as contested (Bargas-Avila & Hornbæk, 2011, 2). Indeed, there are different ways that one can conceptualize user experience and usability. UX can be seen as part of usability, where UX brings the additional component of satisfaction to usability. UX can also be seen as something apart from usability, where UX emphases user performance. Moreover, UX can be seen as an umbrella term for all the user's perceptions and responses. (Bevan, 2009)

The flow element is also used when defining UX. According to Chen (2007, 34), when designing end-user technology one should try to keep the user's experience in the flow zone by offering components of flow, taking care to accommodate for different users, and maintaining flow in the technology (Chen, 2007, 34). As described earlier, the flow experience is characterised by several elements. Flow experience comes from:

- **challenging** activity which is in balance with required skills
- task that has clear **goals** and
- offers immediate **feedback**
- an ability to **concentrate** on the task at hand
- perceived **sense of control** over actions, and not worrying about losing it
- **merging** of action and awareness
- **a loss of self-consciousness**
- **transformation of time** (Csikszentmihalyi, 1990, 49 - 66)

When describing games and the play of the games UX can be seen as a play experience or gaming experience. It is not an easy task to describe or measure a gaming experience as there are so many kinds of games and players (IJsselsteijn et al., 2007). Fun, flow and playability are terms which are relatively often used when explaining UX in game design (Bernhaupt, Eckschlager, & Tscheligi, 2007; Nacke & Lindley, 2008, 82). Both flow and immersion appear to be relevant in characterizing and measuring concept of gameplay (IJsselsteijn et al., 2007). The gameplay experience can be seen as a temporal experience, which is an interpretation made by the player of the game, and which also takes into account other information including many frames of socio-cultural reference. (Ermi & Mäyrä, 2005, 7) When thinking of the player's game experience, the dimension in which the player might move on and leave the game consist of anxiety and boredom (Salen & Zimmerman, 2004, 351) similarly to that presented in the original flow channel model (Csikszentmihalyi, 1990, 74).

It is time to move from UX and gaming experience to the objects inducing these experiences. The next chapter focuses on games in more detail and especially is concentrating on the digital games.

3.2 Games and digital games

The focus of this thesis is on digital games, not games in general. Even among digital games the variety is large, which includes the amount of definitions. Besides of defining digital games the genres of digital games are introduced. Learning-based games are one of the genres which will be presented in this chapter.

3.2.1 Defining game

Games can be defined in many ways. Salen and Zimmerman (2004, 80) offer one definition: "A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome." (Salen & Zimmerman, 2004, 80). Whitton (2010, 22 - 23) sees the definition of games to be unnecessary, and maybe even impossible. In explaining games she prefers to use certain characteristics, which all are not crucial for every game. These characteristics are: challenge, competition, examination, fantasy, goals, interaction, results, other people, rules, and safety (Whitton, 2010, 22-23). One of the characteristics' is the voluntariness of game. (Salen & Zimmerman, 2004, 332; Whitton, 2014, 69). Naturally, these two descriptions are not very different from one another, due to the fact that artificial seems to be similar to fantasy, and conflict to challenge or competition and outcome to results. Both of the definitions also include rules.

Koster (2005, 34) considers games to be very real and life-like, and at the same time they are chunked, abstract, formal, and good tools for learning (Koster, 2005, 34). Every game prepares the player for real life. Basic practices of games

are about sorting, classification, and the meaning of power. In addition, games teach the players how to explore their environment and world (Koster, 2005, 53). When speaking about games, one comes up against two concepts; gameplay and the magic circle. Gameplay is something essential, yet is still an elusive quality that defines the character of the game as a game, and through gaining experience while playing games one also gains one's own conception of good or bad gameplay (Ermi & Mäyrä, 2005, 2). The magic circle is the boundary of the game and the space within which a game takes place (Salen & Zimmerman, 2004, 95 - 96).

Defining game is not easy task, because the games vary a lot. Even the characteristics of the different game definitions vary. To classify games in different genres is one way to catch up the overview, even though the game genre' definition is not easy task to do either as discussed in next chapter.

3.2.2 Game genres

There is a large variety of game genres, partly because the formulation of genres is not a simple task. Scholars most often categorise the genres by focusing either exclusively on, or by recognizing the multiple nature of interactive, narrative, thematic, social or material genres. (Arsenault, 2009, 151) Genres can be divided in action games, adventure games, strategy games and process-orientated games. In action games the criterion for success is motor skill and hand-eye coordination and adventure games characterized by requiring deep thinking and great patience. In strategy games understanding the ways in which priorities and perceptions interplay overtime is ultimately important. Process-orientated games provide the player with a system to play with instead of giving goals. (Egenfeldt-Nielsen, Smith, & Tosca, 2013, 48 - 49)

For example, digital games can be divided into two parts based on their structure. They can either be linear, where the game moves in a straightforward direction or sandbox like games. In sandbox games, gamers have large, open worlds, where they can choose how to proceed (Ocio & Brogos, 2008). For learning purposes, Squire (2008, 170-171) recommends relevant game genres from four categories: targeted games, role-playing games, massively multiplayer online games, and open-ended simulation games (e.g. sandbox games) (Squire, 2008, 170 - 171).

A sandbox game is a game with an open end, and there are many paths and ways to proceed (Squire, 2008, 170). Sandbox game's strengths are in its capability produce emergent gameplay, multiple and different solutions by players, and joint experience. Sandbox games serve players in different ways through their many interests, creative problem-solving and productive acts (Squire, 2008, 168, 170 - 171). It is not necessary to classify sandbox games for example as strategy, adventure, shooting, sport, or car games, because in these games there might be many of those elements included (Ocio & Brogos, 2008). In sandbox learning games (or the ones used for that purpose) the game structures can be used for investigating specific educational domains, and they are suitable for teachers in order to create flexible content (Bellotti, Berta, De Gloria, & Primavera, 2009, 233).

Learning games can also be seen as one of the game genres. The next chapter is concentrating on them.

3.2.3 Game-based learning

Concerning digital games and learning, often used terms are for example: educational game, learning game, educational gaming, and game-based learning. These are all a part of a wider concept called serious games. Serious games are games that not only provide enjoyment, but also something beneficial like education or attitudinal changes (Pavlas, 2010, 1). For educational purposes Whitton (2014, 4) prefers using another kind of description, which is 'games and learning' in spite of game-based learning, because the former is broader and more inclusive than latter (Whitton, 2014). In this thesis the term game-based learning is used, because the study is focusing more on certain game modification planned for teaching purposes (MinecraftEdu), not on the wide range of learning and games.

There are three ways to sum up the use of educational digital games in education: edutainment, commercial entertainment games, and research-based educational video games. Edutainment is often drill-and-practice learning and simple game play, commercial entertainment games are games made for commercial use, but also used in educational purposes and research-based educational video games are designed as a product of the research project. (Egenfeldt-Nielsen, Smith, & Tosca, 2013, 232 - 233).

There is also the model of SandBox Serious Game, which summons players to perform cognitive tasks and at the same time players explore information-rich virtual environments (Bellotti, Berta, De Gloria, D'ursi, & Fiore, 2012). Several scholars suggest the use of commercial games for educational purposes as they demand less time and money than developing educational games, and they also seem to be more attractive than educational ones (Kim, Park, & Baek, 2009, 801).

According to Henriksen (2008, 140), a learning game is commonly understood as an educational experience that makes it fun to explore realistic representations of phenomena (Henriksen, 2008, 140). He challenges this convention and indicates that learning games should not be fun, educational or realistic. Instead of the game being fun, it could rouse the players' participation in certain learning processes. And instead of games being educational, they could be about didactical learning. Moreover, instead of games being realistic they could provide different kinds of perspectives (Henriksen, 2008, 145 - 159). The incitement of players' participation is a means of keeping players in the flow channel through staging, conveyance and solving (Henriksen, 2008, 148). One could move from a learning game to a learning - based game, because latter is something wider both in processes and in didactic agents than the former (Henriksen, 2008, 155)

Important features of game-based learning are: challenge, goals, results and interaction (Whitton, 2010, 33). One of the most important features is the game's capability to engage the player in the game (Whitton, 2010, 41). At the same time, when games are intrinsically motivating for many people during free time and

they play games voluntarily, in the educational circumstances games are imposed extrinsically and they are not actually optional (Whitton, 2014, 69 - 70). On the other hand, there are many factors that provide minds pleasure, and one of the most important ones is learning, which you do when playing a game (Koster, 2005, 40). The aim of an educational game is to arrange task-related challenges for the students enabling the flow experience (Kiili, 2005, 15, 22).

One can learn many things from games such as facts, cognitive and physical skills, attitudes and behaviours (Whitton, 2014, 34). During human history, the needs of learning have changed so the learning aspects of existing games should also be thoroughly thought through (Koster, 2005, 66). Games can provide a different way to think about how, when and what one should learn (Whitton, 2014, 4). There is also some evidence to suggest that one can successfully bring flow elements into learning game (Sedig, 2007, 2090) and it seems that the flow framework is a useful tool in studying game-based learning experiences (Kiili et al., 2012, 78).

The discussion of designing learning-based games is not supported adequately in the realm of theoretical research. Designing the learning-based game seems to be more art than science (Pavlas, 2010, 1). There are also studies about the efficiency of game-based learning, but reasons for the efficiency are not studied (Breuer & Bente, 2010, 1 - 2). When reviewing the effectiveness of games for learning there seems to be a clear lack of empirical studies and also some limited evidence of the value of educational games (Whitton, 2014, 20 - 21). Efficiency in learning-based games could indeed be one of the interesting topics for future research, but this thesis concentrates on the possible differences in user experiences depending on the two contexts of – learning and entertainment.

4 Research methods

In this chapter the methodology of the research is introduced. Firstly the research questions and conjecture are described. Then participants and equipment in addition to the game (MinecraftEdu) used in this study are introduced. After that the procedure of the study and research methods are presented. In the end of the chapter the reliability and validity of the study are also considered.

4.1 Research question

The aim of this research is to study if there is a difference in the user experience of children when they play digital game (MinecraftEdu) during school hours and when they are playing the same game in spare time.
There are two research questions:

- How do user experiences of children differ when MinecraftEdu is played during school time and when MinecraftEdu is played during free time?
- Why do the possible differences exist or why not?

In school time students have different goals, tasks and motives than in free time in this same game. Also the external factors were different during school time when comparing to free time. During free time the sessions were kept still in school area but in different place (except one pair) and with different tool. Also during school time there are more students in same space than comparing free time sessions. The conjecture or hypothesis is that there is difference in user experience of children when they play same game in different contexts. It is based on the assumption that the user experience is influenced by the context (Bargas-Avila & Hornbæk, 2011, 2; Hassenzahl & Tractinsky, 2006, 95; Law et al., 2009, 719).

The direction of the difference is not foreseen. In schools games are carried out extrinsically and they are compulsory and during free time games are intrinsically motivating and played voluntarily (Whitton, 2014, 69 - 70). This might add the pleasure of playing game in free time when comparing playing same game in school time. But it also might be possible that getting opportunity to play game during school time in first place beats the playing the same game in free time. There is also founding that importance of the action does effect on the flow experience (Engeser & Rheinberg, 2008). Value of action might add the possible flow experience. In addition among the flow theory the environment does effect on flow experience (Csikszentmihalyi, 2005, 132). So the flow experience is also measured as a part of the user experience.

4.2 Participants and equipment

There were 27 students (17 boys and 11 girls) participating in the testing sessions and they were from two different classes. From the first class there were 16 children (10 boys and 6 girls) and from second class there were 11 children (7 boys and 5 girls). Only students from the first class participated also in the thinking aloud video sessions. Student ages varied from 11 to 12. The teachers from the classes were involved in the study during school time as they mainly kept the classes or in some cases helped me with methodical parts (with video or giving the forms to fill). I served in dual roles of researcher and teacher.

Every participant went through two experimental sessions. One was during free time and the other during school time. The purpose was, that half of the students were participating firstly in the free time session and after that in the school time session and the rest of the students participated in the opposite order. Because of unexpected absence of students in the end of the test period the amount of the students experiencing free time play experience first was bit bigger (17) than amount of the school time as a first play experience (10).

Children participated in the test in pairs except for one group of three. The idea behind of this formulation was to gain thinking aloud material while they were discussing together. The assumption was that they would talk aloud more in pairs, and on the other hand recording was more successful when there were not too many participants.

The teachers created the working pairs or small groups from the students based on their knowledge of children's companionship. In this case there was the need for pairs to be based on their bonds, as the same pair was acting together both in school time and free time. To keep the free time sessions as normal as possible the choice of pairs was relevant. From both of the classes there were several students, who did not participate in the study including my own daughter.

Free time game sessions were kept in the school area in the Oppimisti room, which is furnished differently and more casual way than other classes. The participants do not use regularly this space. Pairs used one laptop together and often another student was using WASD buttons and another student used mouse at the same game session. Sometimes another student operated all the controls, but they also might have taken it in turns. One pair did their free time session in school's computer class, but sharing the same lap top than others. It is worth noticing that commonly when playing computer game during free time there is only one computer in use.

School time sessions were kept in the computer class and every one had they own computer. As a part of the school sessions the students were given the possibility to learn to handle Minecraft. This happened by using Tutorial world, which is included in MinecraftEdu game seen in the figure 2 (from www.teachergaming.com/media).

FIGURE 2 Tutorial world of the MinecrafEdu game

In free time sessions the Minecraft world was the same Rome world, which was used during school time. The world was downloaded from planetminecraft.com and the builders are AssaultFX and group called the 5th-KGL_clan.

Minecraft is a digital game, which does not have given goal only the player is making it oneself (Bos, Wilder, Cook, & O'Donnell, 2014, 56). The game structure is not linear, but sandbox like. In the game one explores and modifies the environment either alone or with other players (Cipollone, Schifter, & Moffat, 2014). For example one can build a house, village or the city or something very abstractive. Players can play the game together or alone. Minecraft can be used in many lessons and themes, when the goals are well defined and the useful element of Minecraft are chosen (Short, 2012, 55). Cipollone and al. (2014) have found out in their case study that Minecraft is economical way to reveal students creativity. They also mention that all students are not interested in playing and most of the teachers are not capable of using games in teaching. They additionally note that institution do not support these kinds of learning methods. (Cipollone et al., 2014, 2 -14)

MinecraftEdu is a modification of the Minecraft game, which is meant for schools and teaching purposes. MinecraftEdu is the official educational version of the game. MinecraftEdu does not vary much from other Minecraft modifications, when looking at it from the players' perspective. The main differences are in the tools made for teachers. With these tools the teacher can administer the game both during the play and when planning the game for learning purposes.

4.3 Procedure

In the very beginning there were piloting sessions. Two girls (11 year old) from the second class tested the tutorial and Rome worlds at my own home, and they also filled both questionnaires. After that, they also piloted both worlds in the computer class. Also, at the beginning permission to participate in the research was asked from the teachers, principal and parents. The research was introduced to the children and emphasised the voluntariness of participation. Both classes have been working on ancient Rome during their history lessons, so they were studying Rome through MinecraftEdu.

The data was collected through two sessions, from which one was during school time and the other during free time. Some of the free time sessions were kept before school time sessions (eight girls and nine boys) and some were kept afterwards (two girls and eight boys). There were two thinking aloud sessions during one school hour (45 minutes) because of the limitations given by the school schedule. This meant that the session length was no longer than 15 minutes. Thus both in school time and free time periods, the students played 15 minutes.

In the thinking aloud method, participants were encouraged to talk as much as possible together and it was recorded by video. From the fourteen students taking part in the thinking aloud method, eight students (four girls and two boys) participated in the free time session before school time session and eight students (two girls and six boys) afterwards. In two qualitative data videos, or cases, the faces were not in a very good position for the camera and for the other one, a lot of help was given to the participants when they were stuck. They played the rest of the game in teacher's mode. In the end of each thinking aloud session the students were asked two questions: How did the playing feel? What kind of challenges did they meet? After each game period every participant was given the questionnaire to fill in.

There were some differences, which occurred because of these two different contexts. During school time students were told to make goals for themselves about the Roma they just had read about. During free time participants also created their individual goals, but they decided it totally by themselves and it might have changed during play. During school time there were other students as well as the teacher, during free time there was only the pair and the guide in the same room. Some differences were also in activities used in the game. During school time students purchased building material from the guide (to save school time) and during free time they got material by themselves or did not use it. During school time the pair might be a part of the bigger group.

4.4 Methods

The research is more grounded on the empirical material than the theory, although the flow theory guided the analysis and has also helped in the empirical tool. Methods used in this thesis are both quantitative and qualitative. User experience information as well as possible flow elements is collected by a combination of the thinking aloud method and observation (of co-operation). At the end of research session participants were additionally asked to fill in a short questionnaire about the flow experience and in the beginning of research background questionnaire is filled. The content and statistical analyses are also presented in this chapter.

When studying children one meets different challenges when comparing to studying adults. There are several features, which should be taken into account when operating with children. Höysniemi (2005, 265) has collected some of them. There are features like children's verbal skills, children's way of communicating with adult, their capability in concentrating and the possibility to the external activity. In addition one should notice the trustworthiness of self-report and the relations between children and adult (the researcher). (Höysniemi, 2005, 265) For some of these points there might be benefit out of the fact that I am familiar for the participants.

4.4.1 Questionnaires

In this study the within subjects research frame was used, as the purpose was to study the user i.e. play experience of same students in two different contexts and especially the flow effect of the play experience. The conjecture or hypothesis is that there is difference in user experience. This is measured through differences in flow experiences when children play same game in different contexts.

> H0: Playing game in different context does not make a difference in flow experience
>
> H1: Playing the game in different contexts does effect flow experience

Independent variable is the context and dependent variable is flow experiences, which were collected through different questions. The flow scale questionnaire is based on Shernoff's et al. questionnaire related to the flow (Shernoff et al., 2014). The original questionnaire includes nine questions in three sets from which the last one was optional. For the flow scale form was one insertion made (the feeling of the time passing) and one question was taken away from the optional set (Did it feel more like: work, play, both, and neither). This was left out mainly because children would probably see work something else than school

work, and as an age of 11-12 the play is staring to be something those younger children do. So that question would probably be confusing.

This questionnaire has got influence from tradition of Experience Sampling Method and it has measured students' engagement through concentration, interest and enjoyment (Shernoff et al., 2014). Participants did fill this form straight after the game session both in school time and free time. In the questionnaire the responses were scored on a 5-point Likert scale ranging from; not at all (1) to very much (5) and in time question from very slowly (1) to very quickly (2).

Originally the chosen questionnaire was used repeatedly during play experience (Shernoff et al., 2014). It was beneficial to use short questionnaire also in this study, because the lack of time to fill it during school lesson but also because it would be more convenient for the children to fill the short form. Moreover the purpose was to capture the experiences of the game session just passed. The nature of form is psychometric, which is required when measuring subjective variables (Shernoff et al., 2014). When comparing this form contents to the flow list one sees that it includes questions about enjoyment and level of interest but there is no question about goal and feedback. Also feeling of control and loss of self-consciousness aren't questioned. Another questionnaire used in this study was the background form, which is based on Ermi's, Heliö's and Mäyrä's questionnaire (Ermi, Heliö, & Mäyrä, 2004).

4.4.2 Thinking aloud, observation and co-discovery

The thinking aloud method's benefits are that from a relatively small amount of participants one can get large qualitative data, the method is useful for testing many kinds of products, and the method does not require particular knowhow from the research. Then again the disadvantages are that for some people thinking aloud is an unpleasant task to do and it is getting more difficult when the cognitive load is growing. (Ilves, 2005, 209) Using thinking aloud method with children is rarely done and for example the suitable age for using this method is not known. Testing the method in pilot is essential for making sure that thinking aloud method does fit for the group and test situation. (Höysniemi, 2005, 272 - 273) Children have been seen providing useful comments through thinking aloud method among age 6 to 7 years (van Kesteren, Bekker, Vermeeren, & Lloyd, 2003, 41) so thinking aloud methods is most likely to fit also for 11 to 12 years old students.

Observation is the most popular method in evaluating children product usability. In this method child or group of children use the product either freely or under guidance. The analysis is based in use of the product, children behaviour and in the comments made by the guide of the testing situation. (Höysniemi, 2005, 267) One model of the observation is co-discovery, where two children are doing the task together and at the same time they are courage to speak aloud while acting. The benefit of this method is the ordinary nature of the situation. In the other hand doing together may add external activity. The precondition for using this method is the children capability to co-operation (Höysniemi, 2005, 268) In

van Kesteren, Bekker, Vermeern and Loyd study (2003, 14) this method wasn't so successful gathering verbal data, as the children were not cooperative (van Kesteren et al., 2003, 14). In this thesis children's collaboration got support from the fact that the pairs were created based on teachers knowledge about children's friendship and teamwork capability.

The children were asked to play together and at the same time they were courage to speak aloud. In the end method seems to be combination of co-discovery and thinking aloud method. Children were discussing for each other's even though they were not all the time listening, but they seem to stop talking if the pair leaved the game for short time. They also worked with joint task which was permanent (in school time) or might change during the game (free time).

4.4.3 Content analysis

Content analysis can be seen as a single method or as broad theoretical frame. One can also said that all of the qualitative analyses are founded on content analysis. As a theoretical frame it includes for phases; choosing the phenomena under study, coding the data, organizing the data (classification, themes, types and looking for logic, typicality, similarity or differences) and summarize. (Tuomi & Sarajärvi, 2009, 92 - 93)

The process of content analysis starts with the theory work and by knowing well the data. Then data is roughly classified and specification of concepts and research task is made. The density of the appearance of phenomenon as well as exceptions are discovered, which is followed by renewed classification. In the end the classifications are critically validated based on the data and finally conclusions and interpretation is made. (Syrjäläinen, 1994, 90) In qualitative analysis the data is reorganized in a way that conclusions can be transformed in the general way to the conceptual and theoretical level. Before the analysis the data is brought in to the format, where the analysis is possible. Most often the way to do this is transcription. (Metsämuuronen, 2005, 242)

In the beginning of the process of qualitative analysis all the videos (14) were watched through and transcriptions were made. After that the data was explored more thoroughly and the notes were written. The themes of the data and flow instrument were created. In the next step videos were watched and the transcriptions were read through again and renewed classification was made based on the themes.

Some things did arise from the data even though they were not so much in focus. One of them was the *play competence* in Minegraft game. Just intuitively from between the lines of the data, one could see that students' skills in Minecraft did vary. Clearly there were students to whom the game was new acquaintance as well as students, which seem to be very qualified in Minecraft. Others were used to playing Minecraft with some other vehicle than the computer and even though they did know the logic and opportunities of the game, they had to learn more about using the computer's features. Play competence do effect on play experience, but not necessarily in way that more skilled you are more you enjoy the

game. The play competence might effect on the nature of the experience rather than nature of the enjoyment.

Another thing which did vary between the students was the *style of co-operation*. This did vary especially between school time and free time periods. In school the students did naturally interact with other student and not only with their pairs. Some students were asked help more often than others and sometimes students were concentrating guides given by different instructors. Also having own computer (in school) and sharing the laptop (free time) seem to have some effect on co-operation. Even though during the school time students were clearly doing teamwork, they could also concentrate more on their own action. During free time the actions were shared and there were almost constant need for cooperation.

The play experience was described for each student (14) in both sessions, so there were all together 28 play experiences. Play experiences were described by using categories, which arose from transcriptions. These categories were: goal making, wondering, pondering, advice, problem, solution, satisfaction, disappointment, joking and learning. The categories are described more detailed in table 1.

Gategories	**Descriptions**
goal making	suggestions, making decision (of goal), changing or focusing the goal, making questions concerning the goal
wondering	what something is, what to do, why to do or not to do something, what or why another is doing something, what has happened, why something has happened
pondering	pondering game or game's features (likes, dislikes, modes), past game experiences, description of own action
satisfaction	when getting something ready or solved, when pleased in own work or others, asking what other like own work, finding something nice, praising other or oneself
disappointment	building something in vain, finding something not fitting to the own goal, loosing something, not able to do something, not believing in solution, desiring equipment or abilities, failing to do something (move), not liking something
problem	something is not going as it should, not finding the place, not knowing how to use the game, making mistake, not easy to do something, bothered because other player
solution	finding or learning solution, being helped, accepting the suggestion, working hard/long for finding solution, learning new about the world, learning new ways using the game
advice	giving advice or help
learning	learning from past experience, learning new about the world, learning new ways using the game
joking	joking, joking related to the problem, playing in the game (like hitting other player), making a prank

TABLE 2 Description of the play experiences

Transcriptions were organized in statements, which were labelled by categories. The amount of statements of each label was counted for each student in both sessions. The idea was that the play experience can be seen in spoken data, in a way that the more at certain category exists the more it describes the play experience. There were also categories which did occur more rarely than others in general.

4.4.4 Statistical analysis

In the analysis of the questionnaire data the statistical methods are used. With the statistical methods it is conceivable to find regular or occasional factors from empirical phenomenon, evaluate connections between phenomenon and separate phenomenon from each other's (Metsämuuronen, 2005, 25). In this thesis the statistical analysis was used both for questionnaire data and thinking aloud data in SPSS.

From the flow scale questionnaire two sum variables were constructed with factor analysis. Sum variables were made both for school and free time flow measurement. Extraction method was principal axsis factoring and rotation method was promax. Reliability of the sum variables was tested with Cronbach's alpha. The hypotheses of the study were tested with repeated measures ANOVA and paired samples t-test.

4.5 Reliability and validity

Reliability indicates the repeatability of the research (Metsämuuronen, 2005, 64), and the reliability of the research method is constructed in relation to the phenomenon under research (Metsämuuronen, 2006, 200). This is especially so in human science and in qualitative analysis. There do not seem to be preconditions for universal reliability criteria. (Perttula, 1995, 99) The consistent research process and reflection of it, combination of methods, researcher co-operation, and the subjectivity and responsibility of the researcher are some of the criteria connected to reliability. (Perttula, 1995, 102 - 104). A reliable instrument gives a consistent measure of the behaviour or constructs in question (Greig, 2007, 85).

In the chapters above, the research process is described in detail and throughout the thesis the subjectivity and responsibility of the researcher has been defined as openly and clearly as possible. A combination of methods has been used and also analysis has been undertaken both with the qualitative and quantitative tools. The use of the existing Flow Scale questionnaire is confirming the validity. Validity indicates that one is measuring and studying what one is supposed to (Greig, 2007, 87; Metsämuuronen, 2005, 64). The order of students' free time and school time sessions as an first experience was taken account when planning the research to capture the possible first impression effect.

Ecological validity is about how much the research situation is reflecting the real life situation and internal validity is (Greig, 2007, 87). This has been captured by doing the study in the school environment and as the test pairs were created based on their companionship. In the quantitative studies the Cronbach's Alfa has been used for testing reliability. Measurement instrument at school time and at free time was the same and factor analysis evaluates the construct validity of the instrument.

5 Results

In this chapter the analysis of the data and results are introduced. The chapter is divided into three sections. Firstly, the questionnaire analysis and results are presented and then the thinking aloud material and results are presented.

5.1 Results of the questionnaire data

At the beginning of the analysis the factor analysis was made both for school and free time flow scale questionnaires. The extraction method was principal axsis factoring and rotation method was promax. The purpose of this analysis was to find out, if the flow scale questions describe the same phenomenon, in this case flow. Factor analysis assumes the normality of the items, although with principal axis factoring, this assumption is less critical. Visual inspection of the item histograms revealed that there were no critical outliers in the data.

Two of the items in questionnaire did not have enough the factor loading so they were left out of the second factor analysis. These questions were: 'Was the game challenging?' (the factor loading in school time -0,153 and free time -0.380) and 'Did you feel that you learned something?' (factor loading in school time 0,207 and free time – 0.027). The second question is not part of the original flow concept but the first one is. Balance between skill and challenge is fairly often used part of the flow phenomenon. Children may have reacted to both of these questions as them would be proving some sort of failure in playing the game, which then again would not be desirable for them. As the skill question was usable in the factor analysis, one can assume that the flow scale is still reaching the flow phenomenon when leaving one original challenge question out of the scale. Thus the analysis was continued without these two questions. The second factor analysis is presented in table below (table 2).

Mean, Standard Deviation, and Factor Loading for Each Identified Factor and Questionnaire Item.

Factor short label (Cronbach's alpha)	M	SD	Factor Loading
Factor 1: Flow (α = .85) (measured in school)	3.64	0.72	-
How interesting was it?	4.00	0.83	0.69
How much did you enjoy what you were doing?	3.67	0.92	0.897
How hard were you concentrating?	4.00	0.73	0.744
How immersed were you in the game?	3.52	1.05	0.677
How skilled were you at the game?	3.89	1.07	0.655
How important the game was for you?	2.67	1.00	0.592
During the playing the game time was (very slow - very quick)	3.92	1.02	0.570
Factor 2: Flow (α = .73) (measured in free time)	3.59	0.62	-
How interesting was it?	3.78	0.70	0.621
How much did you enjoy what you were doing?	3.67	0.83	0.565
How hard were you concentrating?	4.04	0.81	0.592
How immersed were you in the game?	3.44	0.85	0.607
How skilled were you at the game?	3.59	1.12	0.895
How important the game was for you?	2.41	0.93	0.549
During the playing the game time was (very slow - very quick)	4.22	0.70	-0.241

TABLE 3 Factor analysis

The measurement instrument during school time and free time was the same. Factor analysis evaluates the construct validity of the instrument. Item loading was generally the same between the two measurements except for the game time, which had a negative loading in the second measurement. The internal consistency of the seven items calculated into the sum variable was α = .85 when measured during school time session and α = .73 when measured during free time session. The flow scale was thus constructed as the average of the items for both contexts. Context had no significant main effect on the flow scale average, $t(25) = 0.5$, $p > .05$. Moreover the correlation between the measurements of two contexts was high, $r = .68$ and $p = .000$ (Figure 3)

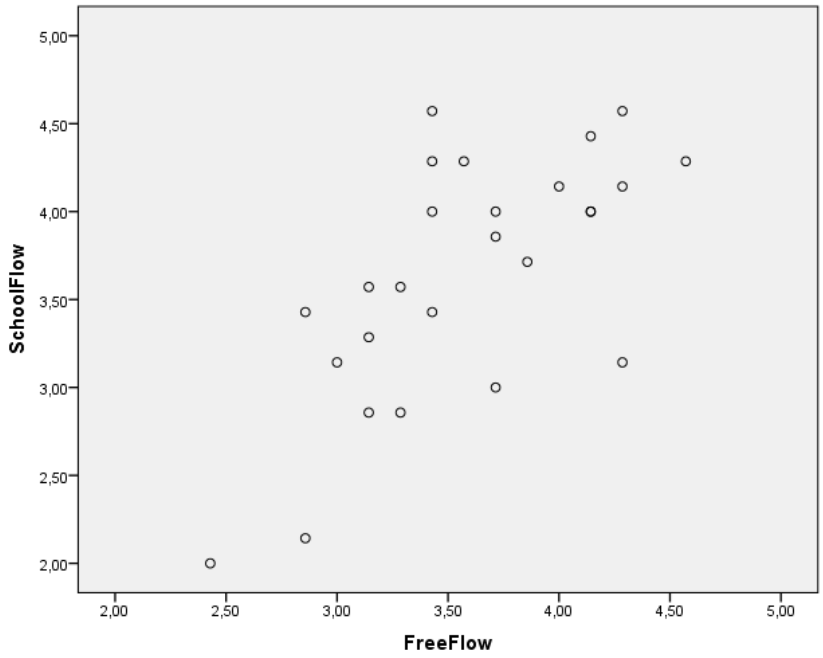

FIGURE 3 School time flow versus Free time flow per student

Because there were two play experience sessions for each student, it was worth testing if a first impression effect existed. The first play experience might have got higher flow scale than the second play experience. There was a statistically significant interaction effect between trial order and context, $F(1, 24) = 5.9$, $p = .023$. Second trials received better flow scores for both those who started in school and free time. However, groups that started during free time had a slightly larger mean in both the first and the second trials (Figure 4).

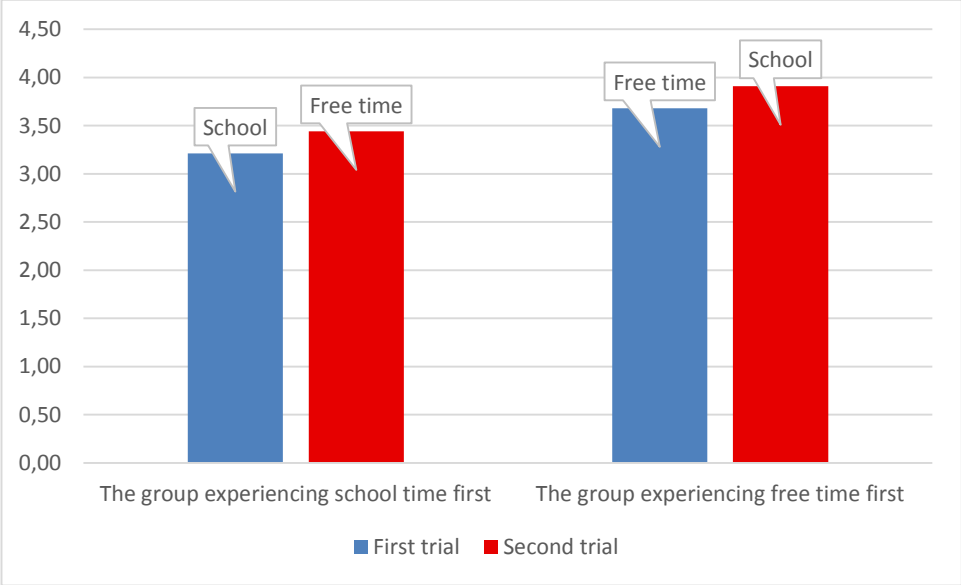

FIGURE 4 Effect of the play order to the flow scale

5.2 Result of the thinking aloud material

For describing play experience the data was organised into the categories. For each play experience (28 all together), only these categories were taken account, which all together encompassed at least 70 % of the statements in each individual play experience case. This meant that 17 play experiences were represented by using two categories, 10 play experiences were represented by using three categories and one play experience was represented by using four categories.

The play experiences including more than one category were more typical to the school time experience than free time experiences. From the school time play experiences, six had two categories, seven had three categories and one had four categories. From the free time play experiences, eleven had two categories and one had three categories. The most typical play experience was constructed from goal making and pondering categories (9/27). The rest of the play experiences had more variation, but all of them included goal making. In table 3 the major play experiences are introduced.

Play experience	Description
The goal making	Goal making was clearly the biggest theme in almost every play experience case. This is quite natural as goal is such an essential part of playing the game. However, there were three cases in the free time session where the pondering theme was more extensive than goal making.
Pondering	Students are speaking about game actions or game features. Pondering existed in most of the play experiences (22 cases), but during the free time session the amount of pondering statements was higher than in the school time session. In the free time play experience, only two of the play experiences were lacking pondering when in school time six of the play experiences lacked the pondering category.
The problem	The problem category was the third most common theme (7 cases) and it has got either the second or third highest score among the user experience cases categories. Here the difference between the school time and free time is clear, as there was only one free time play experience, which included the problem category and others were in school time play experiences.
Wonder	The wonder category existed in six play experiences, from which four were in school time play experiences and two in free time experiences.
Advice	Three of the play experiences included the advice category with a fairly high score (27 - 28 % of the statements), being the second category of the play experience after goal making.

TABLE 4 Results of the play experiences

The most common theme between play experiences during school time and during free time is goal making and high amount of it, even though the goal making category is higher during school time than during free time. The difference seems to be at the level of pondering and the variety of categories describing play experience. During school time there seems to be more variation than during free time. It is also notable, that the problem category existed mostly during school time session. In figures 5 and 6 the categories can be seen case by case.

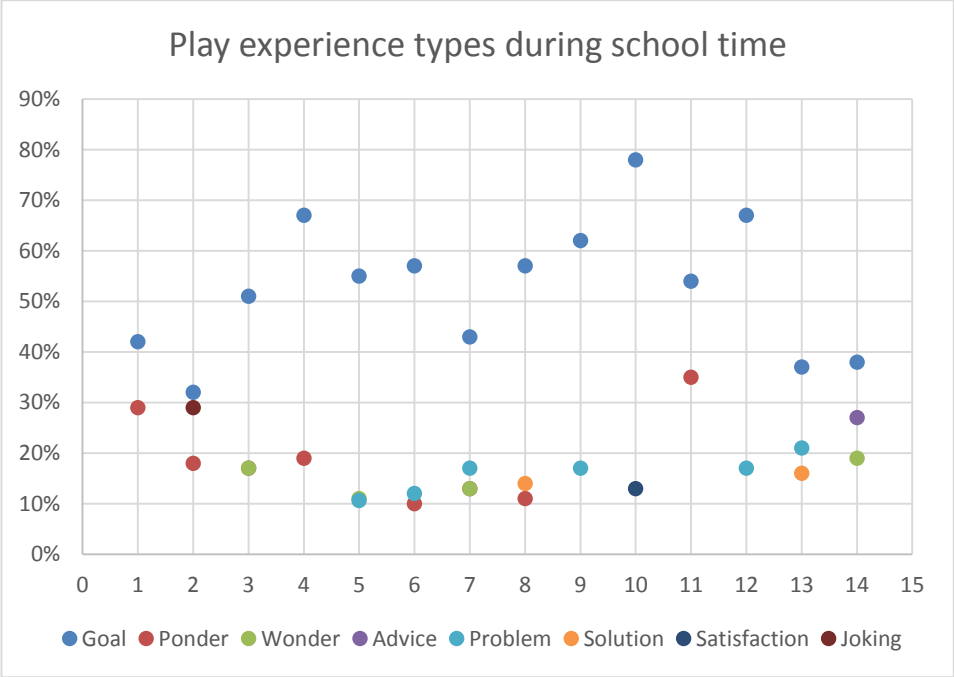

FIGURE 5 Percent of the categories during school time

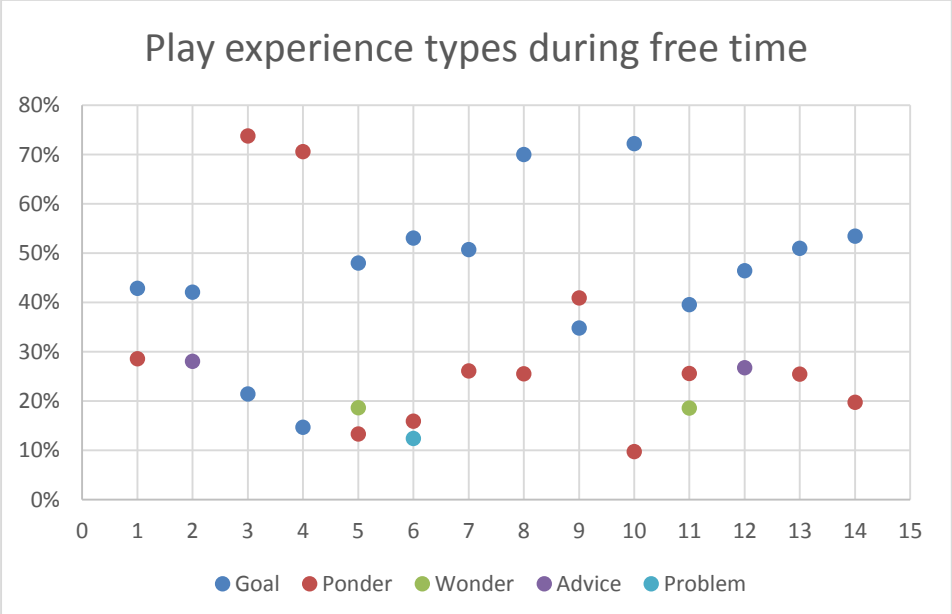

FIGURE 6 Percent of the categories during free time

The number of Goal categories was significantly greater than the number of Ponder categories in both contexts ($F(1,13) = 26{,}23$, $p < .001$, partial-eta2 = .669, N =14). The mean difference was 28 percentage units ($p < .001$). Context did not have the significant main effect ($p = .183$), but category and context had a significant interaction ($F(1,13) = 5{,}70$, $p = .033$, partial-eta2 = .305, N =14). During free time the goal orientation category is still the main orientation, but has reduced while pondering category has increased when comparing to school time play experiences as seen in the figure 7.

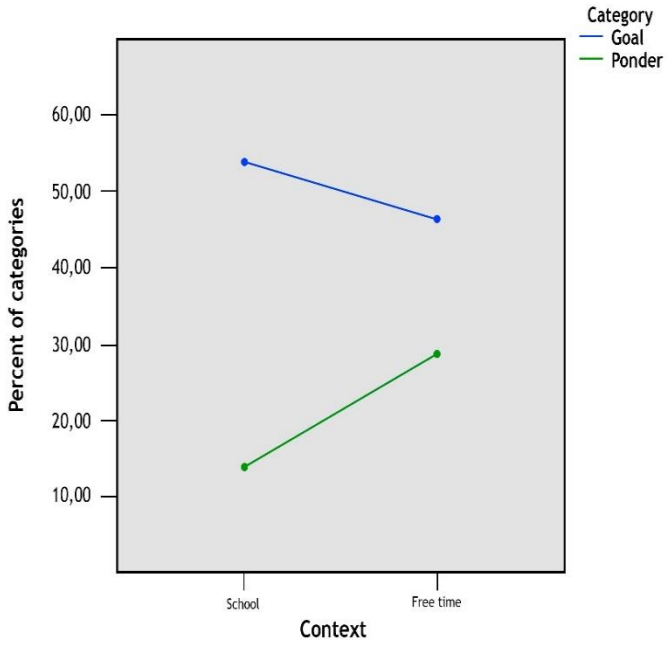

FIGURE 7 Goal orientation and pondering categories in different contexts

6 Discussion

It is time to find out what might be behind the user experience and possible flow experience in two contexts of playing the same game. The purpose of this thesis was to study whether or not there are differences in user experiences of children when playing a digital game in two different contexts, during school time and during free time. Contexts are formed by individuals, tools, resources, intentions and ideas in a particular setting and time (Graue & Walsh, 1998, 9 - 11). Not only do the external factors vary but also the goals, tasks, and motivations differ because of the nature of these two contexts.

About the user experience, there were three main findings from the thinking aloud data. One of them is common for both of the contexts and the other two describe differences between school time and free time play experiences. First of all, the goal making category was clearly the most influential category in the play experiences of both contexts. This is quite understandable as goal is one of the main elements of games (Salen & Zimmerman, 2004, 80; Whitton, 2010, 22 - 23). Goals are quite relevant elements in learning and school life too. As the goals are part both the games and education, this connection between them can be useful, when thinking about using games in school. It is not new thing that many good teacher have used game kind of features in teaching. But using digital games in school is rather new. It would be interesting to find out what possible obstacles teacher find out for starting to use digital games and do these obstacles vary because of different teaching styles.

Based on the findings of the data there are also differences in user (or play) experiences. Firstly, there is more variation in user experience during school time play experience than during free time play sessions. It might be simply because during school time there is more factors (like other students, teacher, exterior goal) affecting the behaviour than during free time. For example students were interrupted to give advice, help or have discussion more often during school time than during free time, and there were more participants affecting the play experience in general. Therefore the behaviour could have been affected by more variation of the context during school time when comparing the free time. That could have an effect on the variation of the play experience too.

Secondly, even though the goal making category was a major element of user experience also during free time play experiences, the pondering category was more influential during free time and at the expense of goal making. The goals are essential part of learning and school curriculum, and this could have an effect on major goal orientation during school time. Goal orientation attitude is constantly reminded and also something that student may connect to the school time. Another reason for this difference might be that during free time students shared same computer and that way they had a literally common goal. Then they perhaps had more time for pondering experiences during free time. When sharing the computer one have to share the goal too. During school time having own computer make it possible to do own part of the joint goal. It is quite general that

student have own computer during school time and also that they have to share the computer during free time.

As a part of the user experience the flow experience was also studied. There were three main findings from the questionnaire data, where the user experience was studied through flow phenomena. The major finding was that among this data the context does not have a significant main effect on the flow scale average. The difference between the mean of flow was not high either. Moreover, the correlation between the measurements of two contexts was significant and high. Therefore, this data indicates that same persons are getting same scores in flow experiences measurement both during school and free time play experience. This gains support from prior research, which has discovered that some people are more likely to experience flow than others. (Engeser & Rheinberg, 2008).

In Partala and Kallinen (2012, 31) research the most satisfying user experiences were more often related to first-time usage, which indicates the importance of novelty and surprise effects. (Partala & Kallinen, 2012, 31) Because there were two play experience sessions for each student, it was worth testing if a first impression affect exists. The first play experience might have gained a higher flow scores than the second play experience. There was a statistical significant interaction effect between trial order and context but not in the direction to the first impression effect. Second trials received better flow scores for both those who started in school and in free time. This means that the flow experience was affected merely by the familiarity than first impression despite of the context.

This finding is very interesting and would need future research. This outcome could indicate that it would be worthwhile using familiar games for educational purposes. In the future studies it might be worth studying the possible differences in either enjoyment of the play experience or effectiveness of the learning when comparing familiar and unfamiliar games used in education. Familiar games might be easier to master, which could then again add both the learning capability as well as the enjoyment of the game.

It would also be interesting to find out why the familiarity gave better scores in flow scale than during first experiment in this case. The reason behind this phenomenon could also be the tension of the experiment in the beginning of the study. So student might have been nervous because of the first test situation and been more relax during second session. But then again the researcher was quite familiar to the students. Furthermore, some of the student did do both sessions at the end of the research period, so tension could not explain these cases. Quite likely nervousness was not the reason here. However, the possibility of tension should take an account in future research.

Overall, the entire context did seem to have an effect on the user experience even though the effects on flow experience were not found. This is notable, as children do not have much control over context as the adults make most decision for them (Graue & Walsh, 1998, 9 - 12). In the end it is quite natural that the differences in context do affect the experience. But based on this study it is not clear does the differences in context effect on the level of flow of play experience. One

recognized problem of the flow model is that the model does not make any distinction between different kinds of flows or with engagement (Draper, 1999, 119). It is possible that user experiences can differ and at the same time cause different flow experiences.

This study concentrated for certain age group and relatively older or younger children may react differently in the different contexts. They also might respond otherwise to the goals and goal making depending on their maturity. Based on the data of this study, it is clear that the context have an effect on the play experience, but in the future research the effect of the context to flow experience would need larger amount of the participants. In the future, it would also be interesting to know, if the different play experiences effect on learning. This would be especially interesting when taking account different player types. If there are students, who do not want to play in general, does this have an effect on the play experience and learning outcomes? It would be also interesting know that are the same person getting high flow score from the game and at the same time also getting good learning results. Could games even help some game orientated students achieve better learning results, through enjoyable and challenging but relevant play experience?

7 Conclusions

In general, the context did seem to have an effect on the user experience. At the same time the effects on flow experience were not found. The differences in context may effect on the experience, because they effect on the behaviour, feeling and in the end the experience too. Generally the goal making was clearly the most influential category in the play experiences of both contexts, which is quite natural as the goal is essential part of the playing game.

The difference in user experience was that there is more variation in user experience during school time play sessions than during free time play sessions. This might occur because of the influence of many more features existing during school time when compared to the free time context. Diverse variation in the context acts on the variation of the behaviour as well as the variation of the experience. Also, having one's own computer during school time, gives students the possibility to concentrate on their own part of the joint goal. During free time, the goal is literally joint and that might add the time for pondering experiences with the expanse of goal orientation. In general when children play during free time they do have joint computer not separate ones, so this arrangement can be seen rather typical.

Although it is not clear weather or not the differences in context affect the flow experience, the same persons achieve the same scores on the flow experience scale both during school and free time play experience. The game experience order does not seem to create the first effect on the flow experiences. The second trials received better flow scores for both those who started in school and in free time. This means that the flow experience was affected merely by the familiarity than first impressions, regardless of the context. This could even indicate that using familiar games in schools could add to the fine play experiences, which could have a positive impact effect on learning too.

Playing games during school time or free time gives students different play experiences. When the same game is played in these two contexts and experiences vary the game play itself can vary. Perhaps different play experiences give interesting insights for students and that way additionally promote learning. Using the same games in different contexts could reduce the gap between different situations such as school and free time. This could even add meta learning knowledge for children. Learning how to learn is valuable attribute to know.

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APPENDIX 1 PERMISSION (5B CLASS)

Suostumus lapsen osallistumiseen MinecraftEdu pelin käyttäjäkokemus tutkimukseen pro gradu – tutkielmassa

Arvoisat huoltajat,

Pro gradu -tutkielmassa tutkin lasten MinecraftEdu pelistä saamia käyttäjäkokemuksia. Minecraft on digitaalinen peli, jossa pelaaja voi luoda erilaisia rakennelmia eri aineita edustavien kuutioiden avulla isossa kolmiulotteisessa maailmassa. Peli perustuu ympäristön tutkimiseen ja muokkaamiseen joko yksin- tai moninpelinä. MinecraftEdu on opettajien tekemä muunnos Minecraft pelistä, ja sitä käytetään kouluopetuksessa eri aineiden opettamisen tukena. Tässä tutkimuksessa tutkitaan MinecraftEdun käyttöä opetuksessa alakoulun luokilla sekä pelin käyttöä kouluajan ulkopuolella. Tutkimus suoritetaan kevään 2015 aikana ja opinnäytetyö valmistuu syksyllä 2015.

Tutkimuksen toteuttamiseksi kerään aineistoa äänittämällä lasten ääneenajattelua videoimalla. Videointeja tehdään kahdesti. Toinen silloin, kun he pelaavat MinecraftEdua opettajan ohjeistuksen mukaan osana kouluopetusta sekä toisen kerran, kun he pelaavat peliä vapaasti koulun jälkeen. Lopuksi oppilaita haastatellaan pelikokemukseen liittyen. He myös täyttävät kyselylomakkeen pelaamiseen liittyen.

Pyydän suostumustanne lapsenne tutkimuksen tietojen keräämiseksi sekä kerätyn materiaalin käyttöön tutkimustarkoitukseen. Tutkimusta varten kerätty aineisto käsitellään siten, että osallistujan henkilöllisyys ei paljastu. Lopullisessa tutkielmassa ei myöskään tule olemaan minkäänlaisia viitteitä oppilaiden henkilöllisyyksiin. Aineistoa säilytetään täysin luottamuksellisesti ja tutkimuksen päätyttyä se tuhotaan. Pro gradu -tutkielma jää Jyväskylän yliopiston informaatioteknologian tiedekunnan käyttöön. Sitä voidaan hyödyntää tieteellisessä tutkimuksessa ja julkaisuissa, esitelmissä ja opetustilanteissa ja se tallennetaan yliopiston kirjaston sähköiseen tietokantaan.

Toivon, että sallitte lapsenne osallistuvan tutkimukseen. Mikäli hyväksytte aineiston keräämisen ja käyttämisen yllä mainituilla ehdoilla ja esitetyssä tarkoituksessa, pyydän teitä vastaamaan tähän viestiin myöntävästi viimeistään <u>06.02.2015</u>. Mikäli ette halua lapsenne osallistuvan tutkimukseen, voisitteko ystävällisesti ilmoittaa siitäkin tähän viestiin vastaamalla.

Annan luvan lapselleni osallistua tutkimukseen ☐
En anna lupaa osallistumiseen ☐

Huoltajan allekirjoitus

_____

Kiitos vastauksista jo etukäteen!

Ystävällisin terveisin,
Merja Lehtiharju
(telephone number)
mebile@gmail.com

APPENDIX 2 PERMISSION (5A CLASS)

Suostumus lapsen osallistumiseen MinecraftEdu pelin käyttäjäkokemus tutkimukseen pro gradu – tutkielmassa

Arvoisat huoltajat,

Pro gradu -tutkielmassa tutkin lasten MinecraftEdu pelistä saamia käyttäjäkokemuksia. Minecraft on digitaalinen peli, jossa pelaaja voi luoda erilaisia rakennelmia eri aineita edustavien kuutioiden avulla isossa kolmiulotteisessa maailmassa. Peli perustuu ympäristön tutkimiseen ja muokkaamiseen joko yksin- tai moninpelinä. MinecraftEdu on opettajien tekemä muunnos Minecraft pelistä, ja sitä käytetään kouluopetuksessa eri aineiden opettamisen tukena. Tässä tutkimuksessa tutkitaan MinecraftEdun käyttöä opetuksessa alakoulun luokilla sekä pelin käyttöä kouluajan ulkopuolella. Tutkimus suoritetaan kevään 2015 aikana ja opinnäytetyö valmistuu syksyllä 2015.

Tutkimuksen toteuttamiseksi kerään aineistoa, kun he pelaavat MinecraftEdua opettajan ohjeistuksen mukaan osana kouluopetusta sekä toisen kerran, kun he pelaavat peliä vapaasti koulun jälkeen. Aineiston keruu tapahtuu täyttämällä kyselylomakkeen pelaamiseen liittyen.

Pyydän suostumustanne lapsenne tutkimuksen tietojen keräämiseksi sekä kerätyn materiaalin käyttöön tutkimustarkoitukseen. Tutkimusta varten kerätty aineisto käsitellään siten, että osallistujan henkilöllisyys ei paljastu. Lopullisessa tutkielmassa ei myöskään tule olemaan minkäänlaisia viitteitä oppilaiden henkilöllisyyksiin. Aineistoa säilytetään täysin luottamuksellisesti ja tutkimuksen päätyttyä se tuhotaan. Pro gradu -tutkielma jää Jyväskylän yliopiston informaatioteknologian tiedekunnan käyttöön. Sitä voidaan hyödyntää tieteellisessä tutkimuksessa ja julkaisuissa, esitelmissä ja opetustilanteissa ja se tallennetaan yliopiston kirjaston sähköiseen tietokantaan.

Toivon, että sallitte lapsenne osallistuvan tutkimukseen. Mikäli hyväksytte aineiston keräämisen ja käyttämisen yllä mainituilla ehdoilla ja esitetyssä tarkoituksessa, pyydän teitä vastaamaan tähän viestiin myöntävästi viimeistään <u>24.03.2015</u>. Mikäli ette halua lapsenne osallistuvan tutkimukseen, voisitteko ystävällisesti ilmoittaa siitäkin tähän viestiin vastaamalla.

Annan luvan lapselleni osallistua tutkimukseen ☐
En anna lupaa osallistumiseen

Huoltajan allekirjoitus

_____

Kiitos vastauksista jo etukäteen!

Ystävällisin terveisin,
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APPENDIX 3 BACKGROUND FORM

This background form is based on Ermi's, Heliö's and Mäyrä's questionnaire (Ermi et al., 2004)

1) Taustatiedot

Olen tyttö ☐

Olen poika ☐

2) Ikäni on _____ vuotta

3) Kotonani on tietokone, jolla voin pelata

kyllä ☐

ei ☐

4) Kotonani on joku muu kone (esim. Playstation, Wii), jolla voin pelata

kyllä ☐

ei ☐

5) Käytän tietokonetta kotona tai koulussa ainakin kerran viikossa

kyllä ☐

ei ☐

6) Pelaan pelejä tietokoneella tai jollakin muulla pelikoneella

en koskaan ☐

harvemmin kuin kerran viikossa ☐

ainakin kerran viikossa ☐

melkein joka päivä ☐

joka päivä ☐

7) Kenen kanssa yleensä pelaat tietokoneella tai pelikoneella? Voit valita niin monta vaihtoehtoa kuin tarvitsee.

en pelaa ollenkaan ☐

pelaan yksin ☐

kavereiden kanssa ☐

perheenjäsenen kanssa ☐

pelaan Internetissä tuntemattomien kanssa ☐

jonkun muun kanssa, kenen?

_____

8) Mitä mieltä olet pelaamisesta? Valitse vaihtoehdoista se, joka sinun mielestäsi pitää paikkansa. Valitse vaihtoehdoista totta, ehkä tai ei.

a. Pelaaminen on kivaa.

totta ☐

ehkä ☐

ei ☐

b. Pelit ovat tyhmiä.

totta ☐

ehkä ☐

ei ☐

c. Pelit ovat mielenkiintoisia.

totta ☐

ehkä ☐

ei ☐

d. Pelaaminen ei kiinnosta minua.

totta ☐

ehkä ☐

ei ☐

e. Peleistä oppii asioita.

totta ☐

ehkä ☐

ei ☐

f. Pelaamisesta on haittaa.

totta ☐

ehkä ☐

ei ☐

9) Miten paljon pelaat Minecraft peliä?

en ole koskaan pelannut Minecraft peliä ☐

harvemmin kuin kerran viikossa ☐

ainakin kerran viikossa ☐

melkein joka päivä ☐

joka päivä ☐

10) Mitkä ovat suosikkipelejäsi? Kerro joidenkin sellaisten pelien nimiä, joista erityisesti pidät. Jos et muista pelien nimiä, voit myös kertoa, minkälaisista peleistä yleensä pidät.

_____

_____

_____

_____

_____

APPENDIX 4 FLOW STATE SCALE

This questionnaire is based on Shernoff's, Hari's and Rowe's questionnaire (Shernoff et al., 2014).

Valitse seuraavista vaihtoehdoista sopivin

1. **Kuinka kiinnostavaa se oli?**
   - ei ollenkaan ☐
   - vähän ☐
   - jonkun verran ☐
   - aika paljon ☐
   - hyvin paljon ☐

2. **Kuinka paljon nautit siitä mitä teit?**
   - en ollenkaan ☐
   - vähän ☐
   - jonkun verran ☐
   - aika paljon ☐
   - hyvin paljon ☐

3. **Kuinka paljon keskityit?**
   - en ollenkaan ☐
   - vähän ☐
   - jonkun verran ☐
   - aika paljon ☐
   - hyvin paljon ☐

4. Kuinka uppoutunut olit peliin?

- en ollenkaan ☐
- vähän ☐
- jonkun verran ☐
- aika paljon ☐
- hyvin paljon ☐

5. Oliko peli haastavaa?

- ei ollenkaan ☐
- vähän ☐
- jonkun verran ☐
- aika paljon ☐
- hyvin paljon ☐

6. Kuinka taitava olit pelissä?

- en ollenkaan ☐
- vähän ☐
- jonkun verran ☐
- aika paljon ☐
- hyvin paljon ☐

7. Kuinka tärkeää peli oli sinulle?

- ei ollenkaan ☐
- vähän ☐
- jonkun verran ☐
- aika paljon ☐
- hyvin paljon ☐

8. Tuntuiko että opit joitain?

- ei ollenkaan ☐
- vähän ☐
- jonkun verran ☐
- aika paljon ☐
- hyvin paljon ☐

9. Pelatessa aika meni

- hyvin hitaasti ☐
- hitaasti ☐
- normaalisti ☐
- nopeasti ☐
- hyvin nopeasti ☐

APPENDIX 5 PLAY EXPERIENCES EVALUATION FORM

	Very		**Between**		**Very**	
Happy						Sad
Strong						Weak
Active						Passive
Involved						Detached
Creative						Apathetic
Free						Constrained
Exited						Bored
Open						Closed
Clear						Confused

Two evaluators evaluated the videos (12 minutes of them) and gave assessment from both students in each adjective pair. The scale example from adjectives: very happy, happy, between happy, sad and very sad