Learning English in Minecraft: A Case Study on Language Competences and Classroom Practices

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Pelien avulla oppiminen on ollut suuren mielenkiinnon kohteena viime vuosina. Erityisesti kieltenoppimisen alueella peleiltä on odotettu paljon, ovathan aiemmat tutkimukset osoittaneet pelaamisen määrän ja englannin arvosanojen vahvan yhteyden. Ongelmana on kuitenkin ollut koulussa tapahtuvan muodollisen ja peleissä tapahtuvan epämuodollisen oppimisen yhdistäminen. Lisäksi on epäselvää miten pelit vaikuttavat kielitaitoon. Näiden mekaniikkojen ymmärtäminen on ensiarvoisen tärkeää, jos pelejä halutaan käyttää opetusvälineenä muiden joukossa. Tämän tutkimuksen tarkoitus onkin selvittää pelien opetuskäytön ongelmia sekä tutkia mitä kielitaidon eri osa-alueita pelaaminen harjoittaa.

Pelien opetuskäytön tutkimus on verrattain tuore ala ja kenttä sijaitsee usean tieteenalan leikkauspisteessä. Tutkielmassa luodaan kattava silmäys alaan kasvatustieteiden, pelitutkimuksen ja kielentutkimuksen kautta ja sen pohjalta toteutetaan kaksi interventiota lukion englannin kursseilla. Lisäksi työn teoriataustassa paneudutaan kielten yleiseurooppalaiseen viitekehykseen ja sen kuvauksiin kielen kompetensseista. Näiden kuvausten pohjalta kehitettiin kompetensseja kartoittavan kyselytutkimuksen pohjana toimivat väittämät.

Tutkimuksessa kuvataan vapaaehtoisena lukion englannin kurssina toteutetut tapaustutkimukset, joiden tarkoituksena on havainnoinnin ja kyselytutkimuksen keinoin selvittää mitä ongelmia pelien hyödyntämiseen liittyy ja mitä kielitaidon osa-alueita opiskelijat pelejä pelatessaan harjoittavat. Pelinä toimii suositun rakentelupeli Minecraftin opetusversio, MinecraftEdu. Kursseilla opiskelijat pelasivat peliä keskenään sekä yhteistyössä norjalaisten oppilaiden kanssa. Tutkimukseen osallistui yhteensä 29 lukioikäistä opiskelijaa.

Tutkimuksessa selvisi, että suurimpia haasteita ovat autenttisen kohdekielisen kommunikaatioympäristön tarjoaminen sekä tasapaino ohjatun ja vapaan pelaamisen välillä. Kielitaidon osa-alueista opiskelijat kokivat pelaamisen harjoittaneen pääasiassa kompetensseja, jotka tavanomaisessa kieltenopetuksessa jäävät vähälle huomiolle. Eksistentiaalinen kompetenssi, kyky oppia sekä pragmaattinen kompetenssi erottuivat selvästi opiskelijoiden vastauksissa. Vähemmälle harjoitukselle jäivät oppilaiden näkökulmasta deklaratiivinen tieto, sosiolingvistinen kompetenssi sekä lingvistinen kompetenssi.

Tutkimus herättää useita kysymyksiä jatkotutkimukselle. Esimerkiksi eri kompetenssien harjoittelun jakaantuminen pidemmällä aikavälillä vaatii laajempaa ja pidempikestoista tutkimusta. Tutkimus osoitti, että opiskelijat kokivat kyseisen pelin käytön harjoittavan taitoja, joita ei yleensä muodollisen opetuksen piirissä käytetä. Tämän todentaminen laajemmassa tutkimuksessa on tärkeää, jos pelejä halutaan jatkossa käyttää laajemmin kieltenopetuksen tukena.

Avainsanat: EFL-teaching, game-based learning, game-based language learning, Minecraft, Common European Framework of Reference

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1 Introduction

Ever since a few seminal and influential studies in the late 2000s found a connection between language learning and playing video games the two have been frequently linked together as examples of game-based learning. Whenever someone is pleading the case for games in learning, learning English is referred to as an example. It makes sense from the formal education point of view: language learning is much closer to the everyday life of school than many other perks of playing games such as improved spatial perception, reaction speed or other rather abstract examples.

Nevertheless, the relationship games and language learning is not as straightforward. On one hand, no one actually knows how to apply games to teaching in a formal context. After all, on average, playing through a game takes at least dozens of hours - it is not uncommon to see players spend hundreds of hours on a single game. How, then, can we implement games that may take dozens of hours to complete in a classroom environment where time is limited? It does seem tempting to combine the two - imagine games that autonomously teach you a foreign language just by playing them. This is symptomatic of a broader gap between formal and non-formal learning: how can schools embrace emergent, everyday learning in a structured manner? The dichotomy is evident in the practices of teachers: only a fraction of teachers in Finland use games in the classroom (Opeka 2015).

On the other hand, the studies that built the foundation for the close relationship between games and learning are quantitative studies with large samples. Ermi, Heliö & Mäyrä (2004) examined children's attitude towards gaming and found that when asked about what they learned from games, children most often cited learning English. As the language of most games is English, they naturally

encountered the language a lot but were also more willing to invest time and effort in understanding the language. Working with a sample of older students, Uuskoski (2011) found that there is a statistical correlation between the time spent on playing games and English grades in upper secondary school. However, the study only took a cursory look on the areas of language that were improved by playing games. For practitioners, the information would be essential.

In this case study, I will examine these two problems in the context of a high school EFL (English as a Foreign Language) course. While a case study cannot give definitive, generalisable answers, it can provide an interesting new angle to the discussion from one specific context and one specific game. The environment used is MinecraftEdu, the educational version of the popular sandbox game Minecraft. Like many other collaborative multiplayer games, Minecraft has found foothold in schools and will be used as an example of the genre in this study. Through interplay of theory and empirical data, I will try to give insight into how to feasibly leverage games in the classroom to improve English as a foreign language instruction. My research questions are as follows:

1. What problems are there in using collaborative multiplayer games in the classroom?
2. How can we determine what parts of language are trained in this kind of games?

In order to answer the research questions, I have conducted a two-part research project in two Finnish upper secondary schools. The first part aims to chart the problems of using games in classrooms through material acquired from observation and student blogs. Based on the analysis, a second iteration of the project was developed in order to survey what areas of language use are trained by playing the

game. Using Common European Framework of Reference (CEF) as the starting point, a number of survey items were developed to answer the question.

In this thesis, I will first introduce the motivation, context and background for the study. In the theory chapter the field of game-based language learning will be presented from different, relevant areas of study. Common European Framework of Reference that is used as the basis of the survey of the empirical part will also be discussed in more detail in the theory chapter. Before moving to analysing the data, the material and methods are discussed. The results of the two parts of the study are then analysed and presented in chronological order. Lastly, I will consider their significance in a broader scope and in relation to the theoretical background while framing questions for future research.

This study has been conducted as a part of two different university projects funded by TEKES - the Finnish Funding Agency for Innovations. First, the Active Learning Spaces Project (2012-2013) (see Pihkala-Posti 2013) and second, FUN: A Finland-U.S. Network for Engagement and STEM Learning in Games (2013-2014). I have previously published articles as part of the above projects and about the progress of this study (for examples, see Uusi-Mäkelä 2013, 2014, Pihkala-Posti & Uusi-Mäkelä 2014). During parts of the research process, I was also employed as a learning designer by TeacherGaming LLC, the company that creates MinecraftEdu.

2 Background

This chapter will provide the context and motivation for the study. My generation, born in the late 20th century, grew up with video games. Anecdotal evidence of how kids learn English from games has been present before research on the field had even begun. My own experiences with games also reinforce this notion and have served as the motivation for the present study.

Learning that takes place outside the walls of educational institutions is referred to as informal learning. It has piqued the interests of scholars and teachers for decades (for earliest discussions, see Dewey 1900). Children learn their first language by listening to their parents, they experiment with bits and pieces, adapt their output based on the feedback they receive and finally start producing language on their own. This learning process is not very structured nor is its pace set by someone else. Indeed, we do not even speak of learning: a child's first language is *acquired*. The child is immersed in an environment where the learning takes place.

This demonstrates humans' inherent capabilities of learning. Along this "natural way of learning" we have developed formal institutions that aim to teach efficiently. The existence of these institutions has given birth to the terms *formal* and *informal learning*. Whenever we struggle with formal learning, we are piqued to borrow elements of informal learning. Indeed, there are many initiatives to recognise, certify and acknowledge informal learning (e.g. Werquin 2010, Cedefop 2009). Thus, the untapped potential of informal learning is acknowledged and yet we cannot seem to be able to agree on how to apply it to formal contexts.

These days, one of the important forms of informal learning happens in games. Already 73.6% of Finns report playing digital games and 52.5 % do so actively

(Mäyrä & Ermi 2014, 15). In addition to learning how to play the games, players can learn a number of things on the side, including improved comprehension of visual information, splitting attention between multiple targets more efficiently and finding and recognising patterns and rules through trial and error, just to name a few examples (Ermi, Heliö & Mäyrä 2004, 63). Prensky points out that the current generation has never known a world without games, and compares teaching them without games to talking to them in an odd accent (2001, 8). To expand on the idea, games require mastery of sometimes-complex rules and employ various ways to convey them to players. Players, usually voluntarily, learn these rules in order to play the game. They are used to digesting difficult concepts in the context of games (Gee 2007, 122). Games seek to strike a perfect balance between being boringly easy and frustratingly difficult inducing a state of flow in their players (see Nakamura & Csíkszentmihályi 2002). High skill combined with high challenge make players lose themselves in the task at hand, being totally immersed. As low student engagement and motivation are major problems in our school systems, using games offers a tempting solution (as suggested by Shernoff, Csikszentmihalyi, Schneider & Steele Shernoff 2003).

However, when it comes to integrating these elements of informal learning in games to formal education, we seem to struggle (Egenfeldt-Nielsen 2007, 276). The recognition of the potential games hold for learning has resulted in a new genre of games that are designed especially for learning. Digital gaming as a field has grown to a 72 billion dollar industry and games aimed at education already encompass two billions of the figure (Greer 2013, 5-7). The vast majority of existing games are simple games that aim to teach very specific content, such as irregular verbs or vocabulary. These are what Egenfeldt-Nielsen calls the first generation of learning games (2007, 265-266). Their progenitors have existed since the 1980's and they have

resurfaced mainly because of the gaming trend. Their resurgence may be one of the reasons educational games have failed to live up to the hype: there is a stark contrast between commercial games that children in the above statistics play and their educational counterparts used in formal education. These so called learning games often lack the visual grandeur of their commercial counterparts and the gameplay is often restricted (ibid. 267-268). More importantly, literature recognises a number of things that can be learned from games, as listed above, but the learning goals of learning games are often set to more mechanical things such as rote learning of calculus or irregular verbs.

This is especially true of language teaching. A survey of ICT development in schools revealed that English teachers were among the most reluctant to integrate games into their teaching (Opeka 2015). However, the results from the same survey seem to suggest the trend is turning and more games are beginning to find their way into language classrooms as well. Despite the low adoption rate, playing games has been shown to increase confidence and reduce anxiety (Sundqvist & Syrén 2014, 14-15) and positively correlate with English grades at the end of upper secondary school (Uuskoski 2011, see full discussion in 3.1.3 below). However, these positive results stem from playing in the spare time. Moreover, they merely point to a correlation between the grades and the time spent playing games.

To bridge the gaps between informal and formal learning, learning games and educational games there are important questions that we need to address. Firstly, to warrant the use of games in the classroom, we need to know what areas of language are improved by playing games. We know that the more students play the better their English grades are. While the grades are supposed to indicate the proficiency in a foreign language, what do we mean by language proficiency? Are we counting how

many words they know or how close to native speaker their pronunciation is? Or are we assessing how well they can communicate with speakers of different cultures? Unanswered, these questions leave games as ambiguous tricks that seem to improve grades. There is a need to expose the mechanics behind the correlation and to identify what language competences they improve.

Secondly, there is a reason why the gap between commercial and educational games exists in the first place. Using commercial games in the classroom has its own hurdles: they are not initially designed to fit the structures of formal education and the learning that takes place in them is not necessarily aligned with the learning goals of formal education. In addition to the time restrictions referenced to above, commercial games are often cost prohibitive or beyond the scope of IT equipment in schools. The lack of resources (both time and money) has been identified as one of the problems in using games and other ICT in education (Pihkala-Posti, Uusi-Mäkelä, Viteli & Mustikkamäki 2013, 940-945).

3 Theory

Despite the emergence of some umbrella terms[1], the field of game-based language learning is still a relatively loosely defined area of study. It consists of (but is not restricted to) research conducted in the fields of education, game studies and linguistics. While the phenomenon itself is not new, with the rise of digital gaming it has resurfaced as a core area of implementation of educational technology.

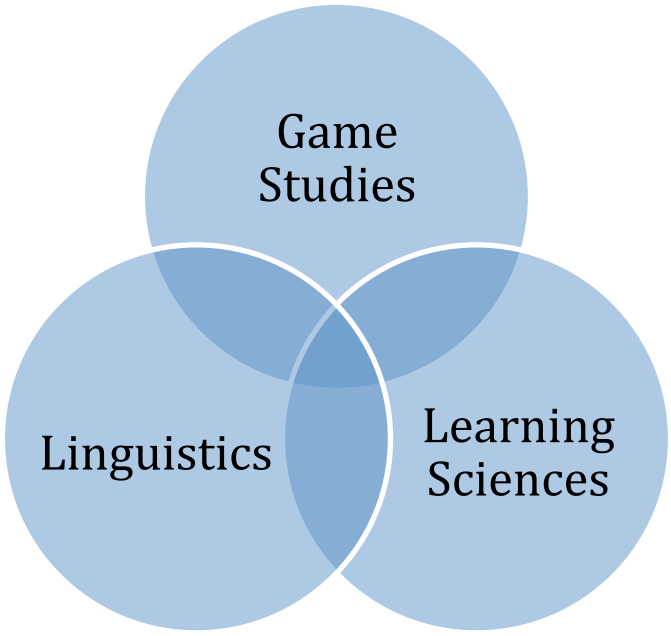

Illustration 1 Field of game-based language learning.

Thus, it makes sense to inspect the phenomenon from a variety of theoretical perspectives to better gain an overall understanding of the field. In this chapter, I will review literature, trying to offer different angles to game-based language learning

[1] Mainly Computer Assisted Language Learning. While the term has gained popularity since its inception in the late 1990s, its focus on computers as medium makes it inapplicable for the purposes of the current study.

from the point of view of educational theory, linguistics and game-studies that are the most relevant fields for the current study. First, I will discuss the mechanics and the problems of merging formal and informal learning and how problem-based learning can serve to introduce real problems to bridge the gap between the two. Secondly, games as a medium will be discussed from the point of view of learning, with special consideration given to the game used in the study, MinecraftEdu. Lastly, I will take a look at different models of language competences and describe Common European Framework of Reference in more detail.

3.1 Aspects of learning in games

Learning sciences is a multidisciplinary field itself and contributes to game-based language learning in many ways. Firstly, the relationship between formal and informal learning will be discussed. Bringing elements traditionally associated with informal learning into formal education is one of the present issues on the field. Secondly, if we are utilising games as more than the content of simple, rote memorisation tools, we need to consider them as learning environments. Third, I will describe a model of problem-based learning, an approach to learning that would seem to fit well with games that are often based on tasks and problem-solving themselves. Lastly, a well-known study on the effects of gaming on English grades will be discussed in detail.

3.1.1 Formal and informal learning

In educational terms, learning from games would be classified as informal learning, something that takes place outside (the control of) formal education. In modern western societies we often associate all learning with formal settings and forget that most of the learning takes place elsewhere (Rogers 2008, 133-135). The distinction

between the two settings is not polar; rather a continuum where on one end the goals and the pace are set for the learner and on the other end where they are set by the learner (or not set at all). There is also a third term, non-formal learning, that governs situations that clearly are focused on teaching and learning but lack the structure (curriculum, credentials etc.) of formal education.

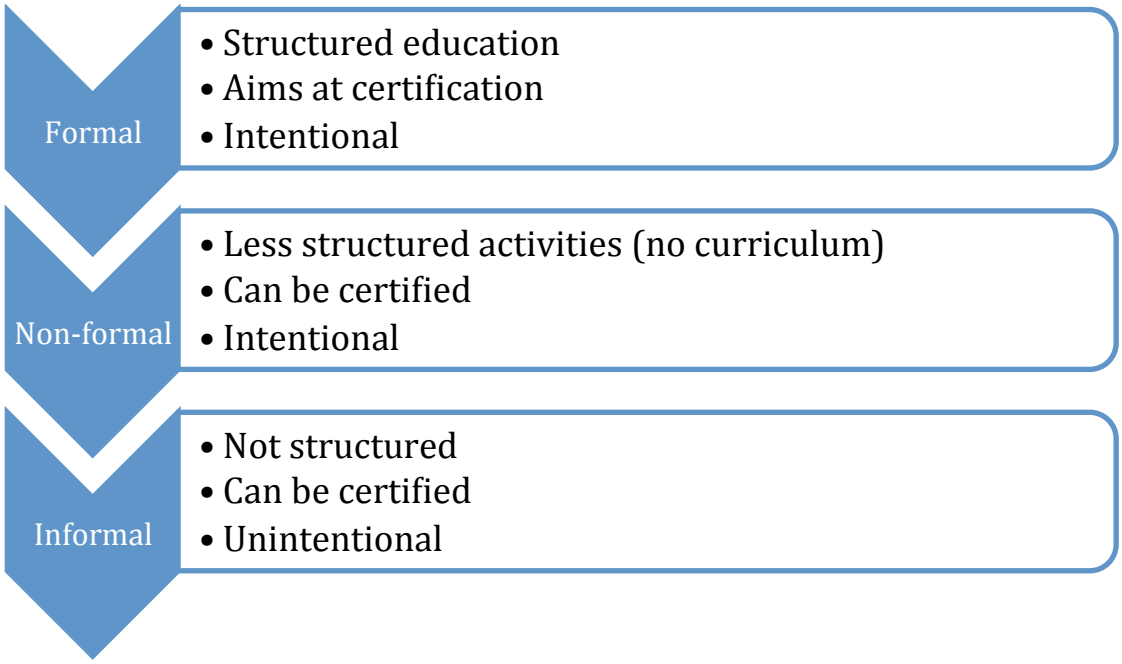

Illustration 2 Formality of learning from most structured to least structured (based on descriptions of Cedefop 2014)

The division between different stages of formality in learning has been a constant topic of discussion for decades. Even in the 1970s, Scribner and Cole asserted that

> if many of the demands of formal schooling are by their very nature discontinuous with those of everyday life, it seems unreasonable to expect masses of children to cope successfully with them so long as they perceive the school to be a hostile institution. (Scribner & Cole 1973, 558)

Their rather grim outlook of formal education is strongly juxtaposed by their learner centric view of informal learning. Krashen (1976) points out that the division need not

be hierarchical and we should not consider formality a question of hierarchy. Rather, he suggested informal and formal learning contribute to different aspects of language learning: formal learning settings can serve as "a formal linguistic environment, providing rule isolation and feedback" whereas informal settings provide the necessary input for language development. (Krashen 1976, 167.) Indeed, contemporary discussion focuses less on the merits of formal and informal learning than how they can both be utilised in language learning.

3.1.2 Problem-based learning

Problem-based learning (PBL) emphasises the process of learning rather than the outcomes. The learning theory has its roots in medical education, where it is indeed vital to solve the problems rather than learn about them. The need for such method arose, as the students were "frustrated with some aspects of traditional education … bored and disenchanted when medical education should've been exciting" (Barrows 2000, vii). An early classic characterisation by Barrows and Tamblyn (in Savin-Baden 2007, 18) identifies following features in PBL: complex, real world situations that have no one *right* answer. These closely reflect the list of John Dewey's principles of learning (discussed in detail in 3.2.2 below). This is not surprising, as Dewey and other pragmatists are often credited with laying the groundwork for PBL as well (Barrows 2000, vii-viii).

The use of PBL in games is not straightforward. According to Savin-Baden, games break the pattern of real-world problems and multiple right answers (or no right answer at all) (2007, 22). I would like to argue, though, that Savin-Baden's view is based on different kinds of games than the one used here. Minecraft's open-ended gameplay fits the description of PBL in most areas: the way the problems are solved is

not limited by the game designers, rather the game is an environment for problem-solving. Granted, the problems are not dealt with in the real-world but, the virtual spaces are rapidly expanding in many areas of life, and problem-solving in virtual space, if not virtual worlds per se, is going to be part of the world that students live in. And, through teacher's role as a facilitator or game-master, MinecraftEdu makes it possible to adjust how open-ended or scripted the problems are (see the description of MinecraftEdu in 3.2.4 below). Problem-based learning fits the basic mechanics of gameplay in a more general way as well: games present their challenges as problems the player needs to solve. In open-ended games such as Minecraft the challenges may be emergent and self-driven but they do exist. In the classroom context it is the role of the teacher to define the challenges and where their place is on the continuum between open-ended versus scripted challenges (see Pihkala-Posti 2014 and Pihkala-Posti manuscript spring 2015).

3.1.3 How games affect English grades

Olli Uuskoski's pro gradu thesis gained national recognition in 2011 in Finland: the story of how boys learn English from playing video games was featured in all major media (HS 2011; Yle 2011). The reason why a master's thesis was featured so prominently is that it presented inexorable quantitative evidence of the connection between language learning and time spent playing video games.

From the perspective of the current research, however, the interesting aspect of the results of the study is the exploration of different genres of games: it would seem reasonable to assume that there is a difference between playing such different games as Angry Birds with minimal language content and World of Warcraft where communication is an absolute prerequisite to succeed in the game. Also, the fact that

the study mapped what areas of language the students believed were improved by playing games, aligns well with my research questions.

Nearly 500 respondents took part in the survey. The sample was considered representative; it was collected from different schools around Southern Finland with fairly average admission-GPA and covering entire classes. (Uuskoski 2011, 26.) There were slightly more girls than boys in the sample (276 vs. 219) but the differences in their gaming-habits were drastic: where boys' playing habits followed Gaussian distribution, over two thirds of girls were in the least active categories (0-1 hours of gaming per week). (ibid. 42.)

The results revealed that there is a connection between certain genres of video games and good English grades: the strongest correlation was calculated for role-playing games and massively multiplayer online games (MMOs). (ibid., 32.) Both can be characterised as quite social: along other means of self-expression role-playing relies on communication to portray the character and large part of the appeal of MMOs is the promise of sociality in a shared virtual world (see description of traits of virtual worlds in 3.2.3 above). Conversely, in the case of some genres such as browser-based games (usually light, short games played in an internet browser, e.g. Farmville) and music games there was a negative correlation between playing them and good English grades. It is important to note that genres with both high and low correlation also went hand in hand with the time spent playing them: the respondents spent most time playing role-playing games and lowest time with browser-based games. It then follows that it is very difficult to say whether the high amount of time on task or the genre itself was the cause for good grades. Nevertheless there are genres, such as driving and sports games, that did not correlate with good grades despite the high playing times. Thus, it could be inferred that these genres are not the

cause for learning English or at least in order to master them, a good command of English is not necessary.

Whereas this study employs a psychometric questionnaire to map the areas of language competence improved by gaming, Uuskoski asked the respondents directly to evaluate how playing games had affected vocabulary, listening, reading, writing, speaking and cultural knowledge. There were considerable differences in beliefs between respondents based on their gaming activity. Overall, 80% believed that gaming had improved their vocabulary, around 50% that their listening and reading skills had improved. The active skills (speaking and writing) received substantially lower scores: only a quarter of the respondents believed they had learned them from games. However, more of the students who spent the most time playing games believed that they had learned speaking and writing from games, maybe pointing to the connection between genres that garnered highest playing times (role-playing & MMOs). (Uuskoski 2011, 33-34.) These are, of course, self-reported learning outcomes and might not represent the actual learning.

3.2 Game studies

Research of games is a fairly recent phenomenon. Thus, it comes as no surprise that traditional games research is yet to form a comprehensive picture of games in education. That is not to say there are no studies, they are just few and detached from the field (Egenfeldt-Nielsen 2007, 272). To supplement this, a section is dedicated to how theories of learning sciences can be applied to game-based learning. However, research in games studies can help to identify the mechanics that make games powerful tools for learning. The definition of virtual worlds will also be explored

alongside their affordances for language learning. Finally, Minecraft & MinecraftEdu and examples of research and the ecosystem around them are described.

3.2.1 Education in games

Defining games as a medium seems surprisingly hard. Salen & Zimmerman boil down a multitude of definitions into a single sentence: "A *game* is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (2004, 80).

One common trait of gaming is frequent failure. Take a mobile game-hit Flappy Bird from early 2014. The simple game pits the player to fly a yellow bird through a series of obstacles. Most players do not make it past the first obstacle on their first try. However, in video games, this is not perceived as critical and players have come to expect it from the games. Salen & Zimmerman (2004, 57) point out that failure is an essential part of gaming, enhancing the feeling of accomplishment when you finally do manage to overcome the obstacles. Games seek to strike the perfect balance between frustration and success. If the first too should rise too high, it results in anxiety and, on the other hand, if the player succeeds too easily it will result in boredom. The middle ground between the two is called *flow*.

As Vygotsky put it: "To observe the rules of the play structure promises much greater pleasure from the game than the gratification of an immediate impulse" (1976, 17). In language learning, we perceive failure in different terms. Research shows that levels of anxiety and fear for wrong answers are high among language learners and that the level of anxiety affects learning (Huang, Eslami & Hu 2010, 35-36). The rationale of reducing this anxiety, then, by using games seems rather lucrative. Indeed, Sundqvist & Sylvén compared non-gamers, moderate gamers and frequent

gamers and found that almost 60% of the frequent gamers did not report to be afraid of making mistakes when speaking English, compared to around 30% of moderate gamers and just over 20% of non-gamers (2014, 15).

From the point of view of game studies, games in education post a challenge. Are we talking about a special instance of games or just another genre? *Learning games, serious games, edugames, edutainment, educational games* - the list of terms to describe games used for educational purposes goes on almost indefinitely. An umbrella term is yet to emerge as the concept itself remains largely undefined: do we only include games created specifically for school or any entertainment game a teacher decides to use in school? (see Egenfeldt-Nielsen 2007; Meyer and Sørensen 2009, 70-71; Ermi, Heliö and Mäyrä 2004, 62 for discussion on the terminology) There is no definitive answer but suffice to say games are a stable topic of discussion.

In the history of games and learning three generations of learning games can be distinguished (see illustration 3 below). They are overlapping and all still present in the contemporary learning games. The first generation of learning games is characterised by *simple behaviouristic models of stimuli and response*. First generation games rely on the number of repetitions to reach the learning goals and there is little difference between the experiences of two individuals. Games are seen as the extrinsic motivation for players to keep practising. (Egenfeld-Nielsen 2007, 273.)

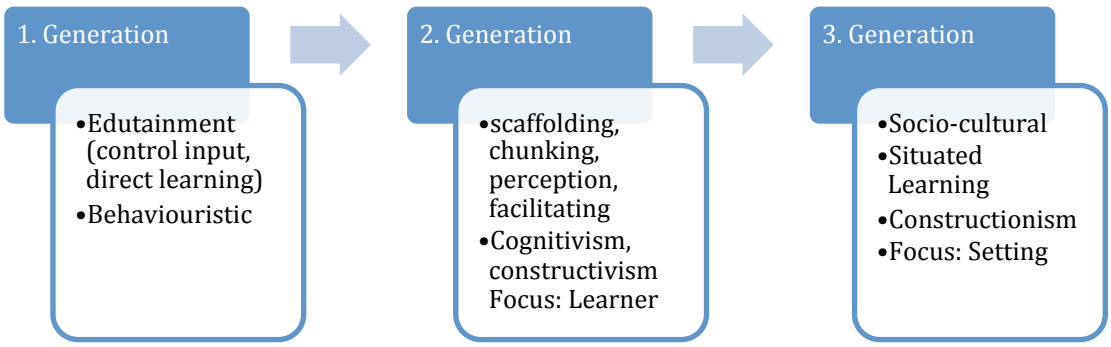

Illustration 3 Three generations of learning games according to Egenfeld-Nielsen (2007, 273)

The second generation of learning games emphasises the *uniqueness of each learner* and takes into account their different approaches to *solving challenges in the games*. Multimedia presentation and scaffolding both offer chances for personal experiences of learning. Lastly, the focus is no longer on memorisation of simple knowledge rather than broader skills such as solving problems and cognitive skills. (ibid.)

What separates third generation from the second is constructionism:

> The construction of knowledge, as meaningful through your orientation in a social context, becomes paramount in 3rd generation games. Instead of conceiving content, skills and attitudes as residing with the user, knowledge is transferred to culture, tools and communities. (Egenfeld-Nielsen 2007, 275)

This approach clearly views games more as the context than content: games are learning spaces (cf. 3.2.2 below, Pihkala-Posti & Uusi-Mäkelä 2013) and players learn new things by participating in them and the communities around the spaces. Therefore the generation of the game can also be defined by how they are used and presented. In this study, the aim is employ Minecraft as a learning space, like

described above, forming the context for communication in the game. In terms of generations, the interventions would be considered as third generation approaches.

3.2.2 Games as learning environments

From the point of view of learning, games can be perceived as one of these environments where informal learning takes place. The concept of learning environment is popular these days and is applied to a variety of solutions from content management systems (e.g. Moodle, Fronter) to physical spaces. Originally, the term was rather political: it was used to denote the distinction between *learning* and *teaching environments.* The notion that the proponents of the term held was that traditional school was designed for the teacher-centric pedagogy when the contemporary paradigm focused on the student perspective. Learning environments were defined as "a profusion of interesting, novel, and useful objects designed to be manipulated, smelled, measured, and arranged" (Sommer & Becker 1975, 75).

The idea of using games as an environment has its roots in constructivist pedagogy. The basis for the theory can already be seen in John Dewey's work, who was one of the founding fathers of modern pedagogy. Dewey's own perspective of school was born during the clash of two societies: the agrarian and industrial. (Rinne, Kivirauma & Lehtinen 2004, 170-174.) At the beginning of the 19th century a transition (both physical and psychological) took place when people moved from the countryside to the cities. The transition could also be seen in school. The silent, mass classrooms largely replaced the apprenticeship model of learning at work in the agrarian society. The transition was necessary to keep the children safe while their parents were working at the factories. (ibid.) According to Dewey, the separation of school and the surrounding environment was too drastic. The four basic human

interests, impulses if you will, of communication, exploration, construction and artistic expression were no longer present. (Dewey 1916, 31.) These basic interests guided children to explore their surroundings freely. In school, they were replaced by shallow imitation of the reality. Dewey believed something was lost in the process. (1916: 42-44, 47, 55.) He raised these questions at the beginning of the 20th century but their traces can be seen at the birth of the information society in the 21st century, forming the roots for the challenges of combining formal and informal learning. The idea of using games as environments, then, could revive the four basic interests Dewey thought were lost at the birth of modern, formal education.

Minecraft, the game that is used in this study, is a special type of game, a sandbox game that casts the player as a resident of a virtual world and gives them a free reign over the goals of the play (virtual worlds will be discussed in detail in 3.3.2) The notion of using open-ended sandbox-games as context for learning is nothing new. It was suggested by Papert already 30 years ago. He describes the strength of open-ended games: “No two people follow the same path of learnings, discoveries, and revelations. You learn in the deepest way when something happens that makes you fall in love with a particular piece of knowledge” (1984, 82). Unlike the traditional educational games based on drill-like repetition and memorisation, this approach focuses on the unique experiences players create and take part in. These experiences can directly be linked with Dewey’s natural instinct of exploration. It seems intriguing to use a contemporary game to evoke these experiences described almost a century apart.

In this study, games are treated as learning environments as discussed above. Rather than content, they provide the surroundings and context for experiences that are not present in traditional classrooms.

3.2.3 Virtual worlds

Minecraft, the game used in the study is labelled a virtual world. However, "Virtual worlds" as a term is used rather liberally to describe games, chat rooms and many more phenomena, both offline and online. There is not an agreed-upon definition for the term. Bell attempts to capture the multifaceted nature of virtual worlds in the following way: "A synchronous, persistent network of people, represented as avatars, facilitated by networked computers" (2008, 2). I will break the definition into a number of statements about virtual worlds to better demonstrate their characteristics. Alongside the characteristics of virtual worlds, I will try and show their relevance to language learning.

- *Synchronised*: Communication at its most natural is synchronous, that is when people communicate in real time. Asynchronous forms of language use have traditionally had a constant role (letters, newspapers) alongside synchronous usage. However, in schools asynchronous communication seems to be the rule rather than exception: we often practise skills by writing letters or emails or by listening to recordings. Thus, synchronous language use supplements teaching the variety of language use in schools (see Pihkala-Posti 2014).
- *Persistent*: The world is ever evolving and it does not depend on a single player's presence. That is different when we compare it to single-player games, for example, where the world usually vanishes after a player leaves. Persistence also comes with the notion of causality: actions the players take have consequences and are not wiped between gaming sessions. The players are, as a consequence, parts of a dynamic whole.
- *Avatars*: actions taken by the player are represented via their avatars. Classic example from playing children is a phrase like "my doll takes a sip of coffee", where although the child takes the action, the acting entity is the doll. In terms of language teaching, avatars provide a face-saving instrument for the students. Although not all virtual worlds utilise visible avatars (first person perspective) they always add a level of distance between the language user and the action. The threshold for communication is significantly lower, when the student acts behind a role.
- *Networked*: Networked here means that everything that you do in a virtual world has an effect on other players as well, because all the players connect to the same world. This correlates with the problem-based learning's notion of real world where solving the problems has consequences.

The description of virtual worlds further supports the idea of using games as the context rather than the content in education. They excel in providing a motivating context for using a language for an authentic or close to authentic purpose.

Virtual worlds are not without their challenges either: Warburton lists questions that need addressing before virtual worlds can fully be utilised in education. First we need to address how to manage our virtual identities (avatar vs. self) and second, to understand the connection of immersion, empathy and learning. Lastly, he stresses the importance of design skills when utilising virtual spaces in education. (Warburton 2009, 425.) From language learning perspective, these are all valid questions. Especially the latter two remain largely unanswered. Arguably, none of them are likely to be answered exhaustively ever, as they are more choices than questions with a correct answer.

3.2.4 Minecraft & MinecraftEdu

Minecraft is a popular multiplatform sandbox-game, published in 2009 by Mojang Ab, an independent Swedish studio. While originally Minecraft started as a one-man operation, in 2014 the studio employed 41 people and was sold for Microsoft for 2.5 billion dollars (YLE 2014, Mojang 2015). The game itself has retained its core mechanisms over the 5-year lifespan: the player appears in a randomly generated world made up of cubical, Lego-like blocks with no equipment or instructions. The goal is to survive by collecting materials, using them to build shelter and refining them into tools. Beyond that, all goals are set by the players themselves. The simple idea of an open sandbox leaves a lot of room for creativity and self-expression. Combined with multiplayer and the ability to modify the game, these features made Minecraft a unique game when it was first released. It also meets all the criteria for a

virtual world listed above in 3.2.3; the game is synchronised, the players are represented by avatars, the world is persistent and everything a player does has an effect on other players as well. Thanks to constant development and the active community, who have created wikis, videos and modified the game, the franchise has grown to one of the most successful entertainment games of all time with over 60 million copies sold to date (Mojang 2015).

Illustration 4 Students in multiplayer mode in MinecraftEdu (TeacherGaming LLC).

The uses of Minecraft have not been solely limited to entertainment. One illustrative example is Block by Block –project run by UN-Habitat, the United Nations' human settlement program that aims to use Minecraft as a medium for youth to participate in planning urban spaces. The three-year project has already been implemented in Kibera slums in Nairobi, Kenya and in Mumbai, India with the aim to transform 300 spaces by the end of the project. (Block by Block 2015.)

Another and perhaps the most visible example of non-entertainment use is utilising Minecraft for education. In 2010, two teachers on different sides of the world

had the idea of using Minecraft in schools. The two proceeded to create an educational version of the game they called MinecraftEdu, designed to meet the needs of teachers who want to introduce games to their classroom. (Goldberg 2014, 122.) They founded a company, TeacherGaming LLC, with the purpose of bringing Minecraft and later other entertainment games to classrooms. Nowadays there are over 6,000 schools around the world that use MinecraftEdu and the company released its second conversion of an entertainment game for educational purposes, KerbalEdu in late 2014 aimed at teaching STEM-subjects. (MinecraftEdu.com 2015.)

MinecraftEdu itself is very similar to the original game; the major changes to the game do not affect the players. Rather, it is the teacher that gets tools to manage a classroom in the virtual space. The educational version adds a host of tools for teachers (see illustration 5 below) ranging from giving assignments to controlling the world settings (day/night cycle, player versus player –combat etc.) to freezing the players. Additionally, it bypasses some major hurdles that schools have to cross such as setting up servers for multiplayer games. (MinecraftEdu-wiki 2015.)

Illustration 5 MinecraftEdu teacher menu - the world settings that teachers can control.

3.2.4.1 Research on Minecraft

Minecraft is fairly new as a research topic and the body of research is still scarce. However, there is a growing interest in the topic: for example, a Minecraft-research conference taking place in Montreal in February 2015 (IMMERSe 2015)

Most of the existing research is made up of case studies and interventions in the field of STEM-education (science, technology, engineering and mathematics). They have looked into teaching mathematics through Minecraft (Short 2012), using Minecraft in a library setting to build a community (Gauquier & Schneider 2013) and using it to empower disadvantaged students in the classroom (Elliott 2014). They are almost exclusively introductory studies that aim to highlight what is happening or what can be achieved with the game. Despite their lack of depth, they all end with a positive outlook; Short, for example concludes that

> The use of video games in the classroom can supplement the use of other media, educational programming, web based videos, etc. Video game use represents another tool in the teacher's toolkit. … Minecraft, is in my view, a game-changer in the field of science instruction. (Short 2012, 58)

Along with the journal articles there is a growing number of master's theses and articles published in non-peer-reviewed journals on topics ranging from digital citizenship to creative writing. Most notable among them from the perspective of the current study is perhaps Marklund's *Emergent Learning – Peer collaboration and learning in user driven environments* (2011) that explored what changes take place when collaboration is transferred from tête-à-tête situations to virtual surroundings with Lego-blocks and Minecraft as the respective media. The results showed differences in the types of play that emerged in different situations: the patterns of play were more predictable with Lego-blocks whereas in the Minecraft-exercise the patterns varied greatly based on for example the earlier proficiency in the game. What

was notable was the presence of emergent, player driven play patterns – the fact that gameplay is not limited to predefined patterns is promising from both game design and pedagogical point of view as the game has potential to provide novel experiences beyond the game designers' plans. (ibid., 23.)

The research on Minecraft and language learning is almost non-existent[2]; the search of background literature only revealed one peer-reviewed example of using Minecraft to teach a foreign language. Hausrath (2012, 5) describes two scenarios for teaching a foreign language through Minecraft. Firstly, even simple construction tasks require student communication: what material to use, who should build what, who is going to gather the material, who is going to make the decisions, just to name a few questions that would arise. Hausrath (ibid.) argues that even such basic tasks require extensive verbal planning and collaboration and goes on to note that this is a prime example of authentic use of language in an authentic situation. Secondly, he notes that Minecraft can serve as the setting for multi-disciplinary project-based learning: he gives an example of researching Native American tribes and then applying that knowledge in the game-world to build structures typical for the tribe in question and infusing them with information about the tribe in forms of books or signs. This could then serve as an experiential, digital alternative to traditional group presentations that are usually delivered in front of the class and hung on the wall afterwards. (ibid., 6-7.) Hausrath concludes by remarking that in computer assisted language learning,

[2] There were examples of using Minecraft for first language instruction, mainly as a tool for creative writing or roleplay (e.g. Civica 2014). While some of them could be transferable to foreign language teaching, they are regarded beyond the scope of this study.

interaction is a key feature and games like Minecraft offer environments rich in interactive opportunity.

3.3 Language learning

From language learning point of view, games have some great assets: they provide authentic content and context for learning in multiplayer games. These affordances will be briefly discussed below. More importantly, we need to define the terms to describe language learning. As stated earlier, one of the shortcomings of previous studies has been the overly general vocabulary. What are the language skills we learn from games? Some popular models will be described along with a broader discussion on the model that makes most sense for the present study.

3.3.1 Authenticity in language learning

Focus on authenticity in language teaching has been a topic of discussion for years, but so far the term has mainly referred to authentic materials (Wu et al. 2011, 86-87). However, as Gilmore argues, the scope of authenticity is much broader (2007, 101). In this context, authentic communication is understood through the learner's experience: meaningful contexts for communication provided by experiential and project-based learning enable authentic communication to take place.

This also something games can provide. Perhaps the greatest asset modern digital games bring to language learning is the ability to play in a group. Games with multiplayer modes allow gamers to act jointly in a virtual world, often collaborating or competing with one another. As Oksanen states "In collaborative learning, members of the group are expected to join forces, with each member's views and resources contributing to a shared workspace in which to solve complex problems"

(2014, 21). This interaction between the players makes it possible to use language for an authentic purpose.

3.3.2 Language skills: different models

Earlier, the opaqueness of the mechanics behind learning languages from games was identified as one of the main hurdles of using games in education. I will use existing language policies to identify a framework that can be utilised to expose the areas of language that are affected by playing games. This framework will then be discussed in the light of existing linguistic research.

What do we mean when we talk about learning a language? What constituents are there? To better understand how games affect foreign language learning, we first need to define terms to describe language use. There are many ways to categorise language into different skills.

A very common approach is to think about the mode (sending, receiving) and channel (written, spoken) of communication, visualised in illustration 6 below (for fuller discussion see Clausen 2009, 8-9 and Laubach Literacy 1997, 13-16). While this model neatly captures the two dimensions of language, it obviously fails to recognise the extra-linguistic dimensions such as social context, cultural knowledge or pragmatics. Furthermore, the categories are very broad: reading encompasses skills such as reading comprehension, recognition of written forms of words, mechanical skill of reading and the ability to read different types of texts.

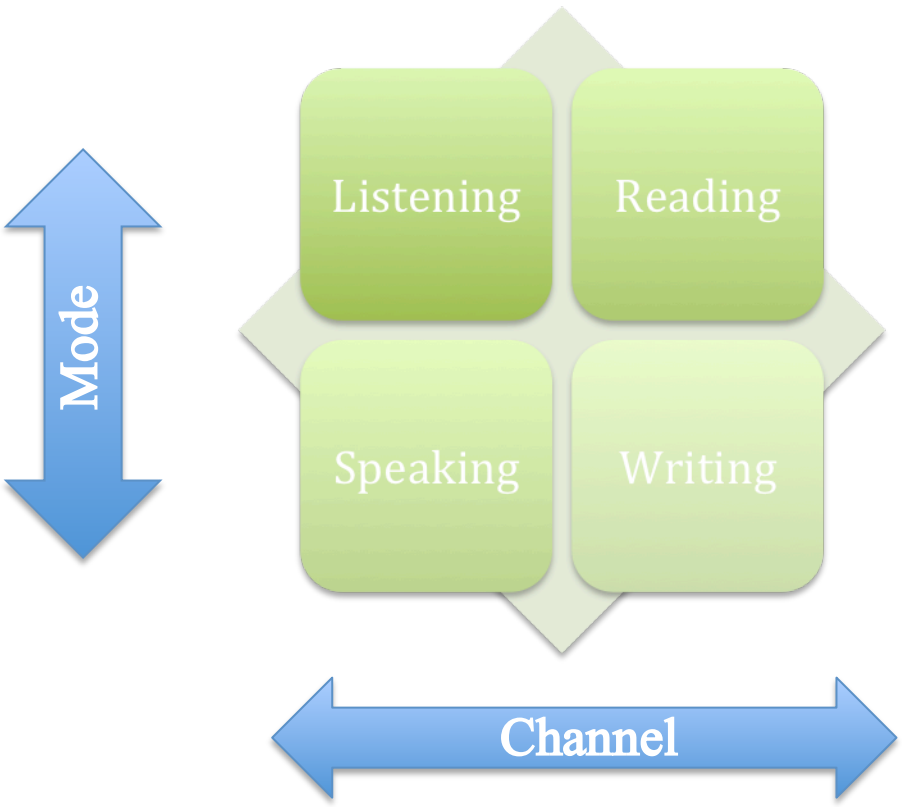

Illustration 6 Four-field mode/channel model of language.

At the other end of the scale is Assessment of basic language and learning skills (ABLLS) that divides 544 language skills into 25 skill areas. Each skill area progresses from simpler tasks to complex ones and profile can be constructed for an individual based on their placement within each area. The areas themselves are ordered into an alphabet and each subskill numbered (e.g. F1: "request by indicating"). (Partington & Sundberg 2009.) The staggering level of detail the model goes to seems impractical from the point of view of formal language learning. Moreover, the scope is very broad as can be seen from illustration 7: it encompasses skills like motor imitation and visual performance. Both skills are undoubtedly involved in communication and development of a child's first language but from the point of view of learning a foreign language they are assumed to be mastered.

	Title	Explanation/Remarks
A	Cooperation & Reinforcer Effectiveness	How well a child responds to motivation and others
B	Visual Performance	The ability to interpret things visually, such as pictures and puzzles.
C	Receptive Language	The ability to understand language.
D	Motor Imitation	Being able to mimic the physical actions of others.
E	Vocal Imitation	Being able to mimic the sounds and words others make. Also called *Echoic* in ABA
F	Requests	Also called *Manding* in ABA
G	Labelling	Naming objects, or their features, functions, or classes.

Illustration 7 Six first items of ABLLS.

3.3.3 Common European Framework of Reference

To strike a balance between over simplified descriptions and unfeasibly detailed models, we turn to a model somewhere between the two extremes. Common European Framework of Reference for Languages (CEF) is the guiding document for language teaching in the European Union and lately increasingly used in other continents as well (see for example CEFR in Canadian context: Council of Ministers of Education, Canada 2010). It aims to provide a common framework for discussion and development of foreign language proficiency (Council of Europe 2001, 1). Instead of translating it, the framework is written in all 24 of the official European languages, which means there is no hierarchy of the original version and the translation.

One of the aims of CEF is to promote equal recognition of different forms of language learning, for example informal language learning alongside the formal

certificates. CEF regards language learners as social agents who develop their skills in two different main categories, general and linguistic competences that are further divided into detailed subcategories (ibid.). The framework is also used as the basis for many national curricula in Europe, including Finland, and increasingly elsewhere as well (Opetushallitus 2014, 350). Its wide acceptance, recognition of both formal and informal learning and detailed description of skills makes it a suitable framework for the purposes of the current study as well.

CEF is not without its flaws and I deem it necessary to address them here as well. There are two main points of criticism: firstly, some of the language used in the framework is only loosely defined and leaves a lot of room for interpretation. For example, Alderson et al ask whether terms such as “look for” and “identify” refer to the same thing and are at loss without examples of what “long”, “short” and “familiar” mean (Alderson et al. 2006). However, as this criticism is mostly aimed at the level descriptors, not the language competences, it can be disregarded for the purposes of the present study. On the other hand, Figueras notes that CEF has been misunderstood and hence misused. Despite the open nature of the framework and the claims of adaptability, it has been criticised to have become institutionalised due to lack of understanding of the original goals of the document (2012, 478). That is to say, instead of familiarising themselves with the whole document, many teachers and policymakers focus only on the level descriptors. While these issues are important, they deal with the shortcomings in the use of the document, rather than the document itself. I do not consider the issues to have an impact for the use of competence descriptions in this study.

Although not perfect, there is no question CEF has been successful in many ways. Figueras attributes the success to the overarching, all-encompassing nature of

the document that made it “a common currency” to describe levels of attainment and terminology (2012, 479).

3.3.3.1 Language competences in CEF

CEF describes language in two different sets of competences. There are general competences and communicative language competences. The former, general competences consist of four sets of skills: declarative knowledge, skills and know-how, existential competence and ability to learn. The communicative language competences are in turn divided in to linguistic competence, sociolinguistic competence and pragmatic competence. CEF further divides the competences into sub-competences with an increasing level of detail. They will be described below under their respective parent competences.

The division into two categories serves to highlight the grounded approach to language learning. Language learning is not an isolated event nor is the learner a *tabula rasa.* The general competences are a set of skills and knowledge the language learner must draw upon to communicate in a foreign language. However, at the same time they are in no way restricted to the domain of foreign language or language learning at all. Consider, for example, intercultural knowledge that falls under declarative knowledge. Intercultural knowledge not only highlights the importance of knowledge of other cultures but how that information also raises awareness of learner’s own culture (Bailly et al. 2002, 26-27). This knowledge can then be applied to a communication situation between speakers from different cultures. By being aware of their own culture, a speaker can better take into account where their partner’s attitudes and assumptions arise from, serving to improve communication between

them. While intercultural knowledge is not necessarily part of the language use itself, in many cases it is a prerequisite for successful communication.

In contrast, the communicative language competences deal with the skills that are directly part of the language as a vehicle of communication. They might be described as what is commonly referred to as traditional language learning. At the heart of these skills is the linguistic competence. As Bailly et al. put it, "no-one can use what they do not have"; linguistic resources such as lexical, grammatical, semantic and phonological are the building blocks of every language and they form the basis for successful communication (2003, 20).

In the light of the above descriptions and regardless the criticism, the competence descriptions form a suitable basis for exploring the different areas that are practised when playing games. They will be formulated into survey items to fit the needs of the current study (see 4.2.1 and appendices III & IV below).

Next, I will describe the main categories of both sets of competence.

3.3.3.1.1 General Competences

As described above the general competences deal with skills that are not part of the language per se but necessary for successful communication. They are divided into four categories: *declarative knowledge, skills and know-how, existential competence* and *ability to learn.*

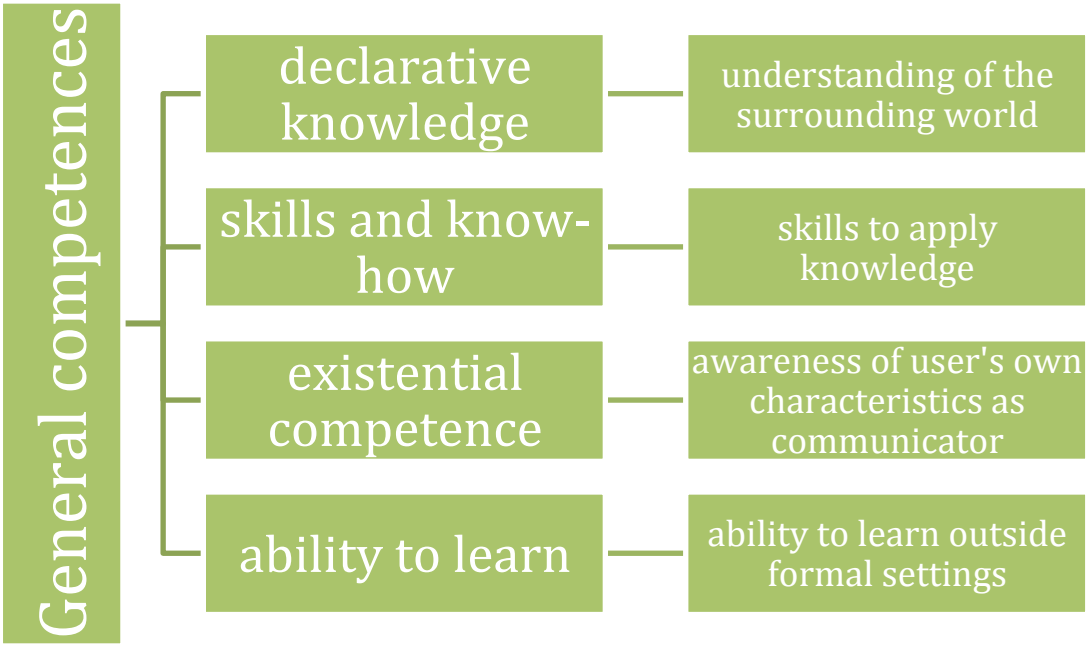

Illustration 8 General competences according to the CEF.

Declarative Knowledge (savoir)

The competences grouped under declarative knowledge all deal with factual information about the surrounding world and the understanding of its social and cultural situation.

Knowledge of the world is an important but often unrecognised requirement for language learning. It consists of knowledge about the environment surrounding the speaker. In order to succeed language teaching needs to take into account the maturity level and what kind of knowledge the student is familiar with. (Bailly et al. 2003, 26.)

Sociocultural knowledge could be classified as a special case of *knowledge of the world.* It is the knowledge about societies and different cultures and as such is important enough to communication to warrant its own category. (CEF 2001, 102.)

Being aware of foreign cultures alone does not guarantee successful communication between speakers of different cultures. Awareness the speaker's own

culture is as important: what things are considered normal and taken for granted might vary between cultures. CEF refers to this as *intercultural awareness*. (ibid., 103-104.)

Skills and Know-how (savoir-faire)

The framework is action-oriented; communication is considered a necessary tool to achieve goals in everyday life. *Skills and know-how* could simply be described as a set of skills that enable living as a member of a foreign culture, and consequently to effectively communicate in specific areas of life. (CEF 2001, 104.)

This orientation to everyday life is most evident in *practical skills and know-how*. They include the living skills such as carrying out most basic routines ranging from walking to cooking and changing clothes but also more socially oriented skills like vocational skills and leisure skills. They might include skills to carry out work or skills to take part in team sports or to pursue crafts and arts. (ibid., 104-105.)

Intercultural skills and know-how on the other hand are more abstract already; they are the skills that are necessary to effectively communicate between members of different cultures and the ability to sort out intercultural misunderstandings when they do arise. They aim to make the learner a cultural intermediary, capable of fluidly communicating between different cultures. (ibid., 105.)

Existential Competence (savoir-être)

The increasing of level of abstractness is evident in the category that encompasses the personal traits that affect the communicative activity of a learner. Simply put, our language use is greatly affected by our attitudes, motivation, values, beliefs, cognitive styles and personality factors.

The length and breadth of the above list alone should indicate the complexity of the existential competence – it also raises the question to what extent can these traits be considered a competence. The Framework addresses these questions by asking to what extent the development of personality can be considered the goal of education and in what ways these traits are to be taken into account in teaching. (CEF 2001, 105-106.)

Ability to Learn (savoir-apprendre)

The ability to learn languages might be considered innate; after all we have all acquired our mother tongue without a conscious effort. However, the skills we need in order to learn a new language can be practiced. They are developed in the course of the experience of learning.

The first language we acquire establishes the linguistic system and a framework to which subsequent languages are compared. Whether new languages are considered a threat or an enrichment to one's language system can greatly affect the ability to learn new languages. This *language and communication awareness* involves the knowledge and understanding of how languages are organised and used. (CEF 2001, 107.)

General phonetic awareness and skills tread very close to the communicative language competence. The reason they are categorised under the general skills is that they are not tied to a certain language; rather they are phonetic abilities such as the aptitude to distinguish between different sounds, to produce them and to catenate sentences into strings of separate phonological elements. (ibid., 107.)

Study skills, as the name suggests revolve around the learner's ability to effectively utilise opportunities to learn language. They can be as simple as

maintaining attention on task at hand or co-operative skills to work in groups. However, they include more reflective sets of skills such as the ability to recognise one's own strengths and weaknesses as a learner or the organization of learning strategies in a feasible way to accomplish one's goals. (ibid., 107.)

Heuristic skills are the abilities to incorporate new information and experiences to the existing knowledge. They are the skills to look for new information and to utilise the necessary, sometimes technical tools to do so. (ibid., 107.)

3.3.3.1.2 Communicative Language Competences

General competences above included the competences that are not directly linked with the language itself, while communicative language competences could be described as the tools to realise the language user's communicative intentions. They are not only the traditional vocabulary and grammar - as the name suggests they derive from Hymes' notion of communicative competence. He aptly describes the importance of communicative aspects of language:

> A child who might produce any sentence whatever - such a child would be likely to be institutionalized: even more so if not only sentences, but also speech or silence was random, unpredictable. (Hymes 1972, 277)

The ability to produce grammatical sentences is clearly not enough. While Hymes was writing about first language acquisition, it governs many aspects of foreign language learning. However, as Byram put it, an intercultural setting that foreign language teaching prepares us for requires a more comprehensive set of skills (1997, 9). Successful and efficient transfer of messages is not enough. He labels the set of intercultural skills that are necessary to become a "sojourner", an intercultural mediary, as intercultural communicative competence (ibid., 32-33).

General competences are divided into three categories (see illustration 9): *linguistic competence, sociolinguistic competence* and *pragmatic competence.*

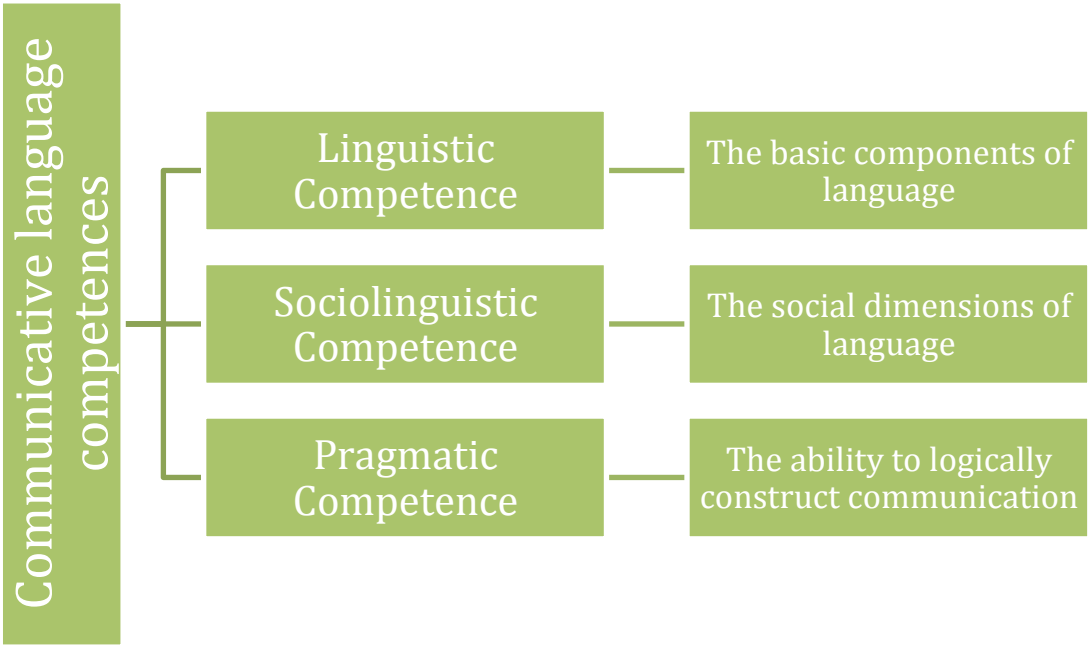

Illustration 9 Communicative language competences according to the CEF.

Linguistic competence

As described above, the backbone of producing language is formed by the linguistic competences. They include lexical competence, grammatical competence, semantic competence, phonological competence, orthographic competence and orthoepic competence.

Lexical competence, as the name suggests, covers the words of a given language. The CEF further divides them into categories and sub-categories. Sufficient level of detail here is the division into lexical elements and grammatical elements.

While the grammatical elements themselves were part of the lexical competence, the rules of their usage make up the *grammatical competence*. It may be surprising that the Framework itself does not subscribe to any theory of grammar, be it descriptive or prescriptive (CEF 2001, 112-113). While they do recognise the rise of descriptive linguistics, the writers point out that no model has been created that could directly facilitate language teaching (ibid. 108-109). Instead, they limit themselves to some very general and academically agreed-upon categorization. The main division of grammar is into morphology and syntax, i.e. into the rules governing the production of words and to the rules of forming sentences and phrases.

Semantics covers how the language conveys meaning through different processes. There is the meaning conveyed by words and phrases (lexical), the meaning conveyed by grammar and the meaning conveyed in the social interaction (pragmatic). The description of *semantic competence* in the Framework is careful to emphasise the dualistic articulation of language:

> Languages are based on an organisation of form and an organisation of meaning. The two kinds of organisation cut across each other in a largely arbitrary fashion. A description based on the organisation of the forms of expression atomises meaning, and that based on the organisation of meaning atomises form. Which is to be preferred by the user will depend on the purpose for which the description is produced. (CEF 2001, 116)

Phonetic competence is perhaps the most straightforward of the categories. It is the competence to produce the sounds necessary to communicate in a language, be it the pronunciation of a single syllable or word, or prosody (the stress and rhythm of a sentence). In a language with low spelling-pronunciation correspondence, such as English, the notion of *orthoepic competence* ties closely to the pronunciation. Orthoepic competence is the ability to transform the written forms into spoken language. It requires knowledge of spelling conventions, ability to consult different

sources of information to learn pronunciation of new words and phrases, how punctuation affects intonation and pronunciation and the ability to resolve ambiguity through context. (CEF 2001, 118.)

Sociolinguistic competence

The category of sociolinguistic competence is closely related to sociocultural competence. The division into two categories was made to separate between the skills of conveying social relations through language and the skills to understand language in its social context.

Linguistic markers of social relations include (but are not limited to) the choices of greetings, the use of address forms (Mr., Your Honor, darling, etc.) and conventions of turn-taking. (CEF 2001, 119.)

According to the CEF, *politeness conventions* are one the most common reasons for "inter-ethnic misunderstanding", i.e. cultural conflicts. This happens when politeness conventions divert the direct message between speakers. They include for example the use of hedges to lower the imposition of a message, showing interest in the other speaker or simply the appropriate use of politeness phrases such as "thank you" or "please". As above, politeness conventions are closely related to sociocultural competence or more specifically intercultural awareness and intercultural skills and know-how. They could be interpreted as the linguistic manifestations of the social relations. (CEF 2001, 119.)

Expressions of folk-wisdom display the knowledge of a shared culture. They are not limited to phrases or sayings; on the contrary, phrases and sayings form the basis for many cultural messages, word play, jokes and puns. (ibid., 120.)

Register differences manifest themselves in different social contexts: it may be appropriate to say "Hello old chap!" to a friend in a pub but addressing the judge in a court or a priest in a church in that manner would raise eyebrows. For language learners the importance is all the more significant if the target culture has more social hierarchy than their own. The Framework suggests the use of fairly neutral register in the early stages of language learning but notes that through exposure to the target culture the learners quickly become aware of the register differences. (ibid., 120.)

Closely related to the register is the *dialect and accent*. The learners should be aware of the connotations of the use of certain linguistic items. These items are associated with certain areas, occupations, social classes or levels of education. In terms of language teaching, there is a choice to be made here: what should be the default accent or dialect taught to the learners? The choice is political in nature and debatable. (ibid., 121.)

As evident, the line between sociolinguistic competence and sociocultural competence is all but clear, even arbitrary at some points. While it is argued that skills under sociolinguistic competence are especially related to language and not dealt with elsewhere, many of the underlying structures are derived from the surrounding society rather than language (CEF 2001, 118).

Pragmatic competence

Whereas grammatical competence dealt with the rules governing the production of sentences, pragmatics is the study of the conventions of ordering messages in a context-appropriate way to communicate ideas. It is, as Yule put it, "the study of what speakers mean", when we interpret meanings based on other factors than the meaning of words alone (112, 2006). To rephrase, grammar places words and phrases in an

order while pragmatics arranges the sentences into coherent messages to convey ideas. On a larger scale, pragmatics looks over the literal meaning of utterances to see how the meaning of a message is dependent on the speaker, listener and the context. (Thomas 1995, 12.)

Discourse competences are a set of criteria for arranging sentences, ranging from arranging them by temporal order, cause/effect, thematic organization or rhetorical effectiveness. They are governed by Grice's co-operative principle: "Make your contribution such as it is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged." (Grice 1975, 43). Even though phrased as an order, the principle seeks to describe how successful communication usually happens. Grice states that speakers follow four maxims to achieve this:

- *quality* (try to make your contribution one that is true);
- *quantity* (make your contribution as informative as necessary, but not more);
- *relevance* (do not say what is not relevant);
- *manner* (be brief and orderly, avoid obscurity and ambiguity).

While people generally abide these maxims, sometimes it is justified not to do so. One such example is expressions of politeness; both quality and manner maxims may often be violated when politeness conventions in English are followed.

Functional competence is the understanding of how language is used for a specific purpose. The functions of the language can operate on different levels: there are micro functions - functions of single, usually short utterances. They include socializing, expressing attitude, turn taking and suasion, to name a few examples. On a macro level, we talk about the function of a longer sequence of sentences, sometimes the whole conversation: is it a negotiation, a description, an explanation or

an instruction? Finally there are *interaction schemata*: a set of social patterns for different situations, ranging from simple question-answer patterns to the patterns of shopping for groceries. They are not to be confused with declarative knowledge of how shops and currency work: these are stereotypical conversation patterns and expectations that underlie a given situation. (CEF 2001, 131-136.)

3.4 The Field of Game-based Language Learning

At the beginning of the chapter the field of game-based learning was defined as the area at the crossroads of three separate fields: learning sciences, game studies and linguistics. What, then, are the special characteristics of the field?

From the point of view of learning sciences, learning a language through games mixes elements of formal and informal learning to produce an authentic learning environment. The outcomes of utilizing games that profoundly present informal learning in a formal setting such as school are among the most interesting questions in the field.

In game studies, game-based learning is mostly seen through its deviation from the familiar patterns of entertainment games (see Egenfeldt-Nielsen 2007). While the field can certainly be defined through what it is not, the emergence of games and learning as a business will need a new terminology, separate from or at least parallel to that of entertainment games. What games studies also provide is the terminology around games and virtual worlds. An existing terminology forms a basis for discussion about games as learning environments by exposing the mechanics of games as systems.

Finally, through linguistics we have the terminology to discuss what kind of language learning takes place in games. As noted above, a major drawback of

previous studies has been the lack of detail - they have either been content with assessing the motivation of the students or quantifying the learning in very broad terms (see 3.1.3 above). By investigating language learning through a both nationally and internationally recognised and established framework such as the competences of CEF, the results of the study can have direct applicability to both practice and research.

As stated earlier, the field still remains largely undefined. However, some essential questions arise from all the fields that can help us better understand game-based language learning as an area of study:

- What is the relationship between games used in language learning and their entertainment counterparts?
- What aspects of games are beneficial to learning languages?
- How can the informal nature of learning in games be integrated to language learning in formal educational settings?
- How can we determine and measure the aspects of language that are improved when playing games?

Overall, the overlapping field concentrates on the interactive environments games provide as authentic contexts for language learning. Naturally, this is just one interpretation of the field and its foci but it provides the angle and context for the basis of the current study. Indeed, some of these aspects are also unsurprisingly in the focus of this study (see research questions in chapter 1 above).

After laying the theoretical foundation for the field of game-based language learning from the perspective of the current study and describing the CEF in more detail, we next move to present the structure, material and methodology of the case study.

4 Research design, material and methods

In this chapter, the research process is described in more detail. First, an overview of the process and the research setting is presented. Next, I will describe how the material was collected and in what kind of settings the interventions took place, followed by more detailed description of methodology to collect and analyse the data.

4.1 Research design and material collection

At the beginning of the study, two research question were laid out to map the hurdles of using collaborative multiplayer games (such as MinecraftEdu) in formal educational settings and what areas of language are trained by playing games. To answer these questions, two interventions were carried out in schools by investigating how new ways of teaching work in an authentic context. Interventions are intentional changes of strategy and when used in research context, systematic studies of how those changes affect the studied phenomenon (Fraser & Galinsky 2010, 460). In this study, collecting the data from an authentic context was considered important and intervention was selected as an approach (cf. staging the research in a laboratory setting).

The first intervention took place in 2013 in a Finnish upper secondary school and the aim was to map what kinds of problems there are in using collaborative multiplayer games in language teaching (see research question one) and what kinds of activities the students would engage in, given a free choice. Eighteen students (except one, all male) chose to take part in an elective English course and they reported their activities in a course blog over a two-month period. The games that were used in the

intervention were MinecraftEdu (described in detail above in 3.2.4) and Civilization IV. Civilization IV (2005) is part of the long-running series of strategy games where the player takes control of an ancient civilization to guide them through ages. In this study I will concentrate on MinecraftEdu but some blog posts might refer to both games. The course was initiated by the school but the interventions themselves were planned in collaboration between the teacher and the researcher. While the course ran for almost two months, there were only three sets of two-hour contact lessons. The rationale behind this approach was to leverage the informal, voluntary aspect of games. The contact lessons took place at the beginning, in the middle and at the end of the course. During the course, most of the communication was done in the games and through a course blog, where the students reported their progress in both games (available online at http://pelikurssi.blogspot.fi/). The blog was used for developing, coordination of and reporting about the projects. On the blog, students proposed ideas for building projects, and, after a round of ideas, voted a city of their own design as the project. The only limitations given were collaborative building and the use of English as the communication language. Additional observation data from the contact lessons and the chat log for the whole duration of the course was collected as well. The data from these three sources was analysed to provide an answer for the first research question.

The second intervention was designed based on the feedback and observations of the first intervention. The points of iteration will be described in more detail in the next chapter (5.1.2). The second intervention took place a year later in another Finnish upper secondary school: the data of the second intervention were gathered between November and December 2014. The age of the students remained the same as in the first intervention (16-18). There were 10 respondents. Like in the first set, the gender

distribution was skewed: there were eight male and two female students. Given the uneven distribution, no feasible comparison based on gender can be made from the data. This time the focus was on improving the design of the course based on the first iteration and mapping the specific competences that could be trained in the game (research question two).

Like before, the activities were optional and took place during and after the school day as an English as a Foreign Language project. The course was advertised by one of the English teachers after which the interested students contacted the researcher. Each participant responded to a two-part survey. The first part of the survey mapped the gaming habits of the participants and the second asked the students to evaluate their stances to statements about what competences were trained when playing the game.

Based on the first intervention (see 5.1 below), it was hypothesised that a more authentic communication environment would make using a foreign language more meaningful to the students. Thus, a message was posted to the Minecraft Teachers-online forum, looking for interested collaborators to provide an authentic communication environment. There were multiple responses out of which a Norwegian teacher with his class was chosen. They were selected as the non-Finnish speaking participants for practical reasons: they already had the software, knew how to play the game and were looking for international collaboration as well.

During the study, the students prepared and worked on a project with a group of Norwegian students (who did not take part in the survey). The Norwegian students were younger (10-11-year olds) but more familiar with MinecraftEdu as their teacher uses the game actively as an educational tool. Together with the Norwegian teacher, a set of activities was planned around stereotypes between the two cultures. The Finns

began by constructing a Minecraft-world with Norwegian cultural items (e.g. a salmon, Thor, the god of thunder, an oil rig) that also introduced them to the game. Next, the Norwegians visited the map and the Finnish students explained the motivation behind their selected symbols of Norway. Afterwards, they proceeded to building more structures in the map. The lesson was designed to provide a low-threshold context for initial communication between the groups of students. They set the topics for conversation without limiting its course.

Illustration 10 Finnish students' Norwegian stereotypes in MinecraftEdu.

The next lesson revolved more around collaboration: the task was to begin building a village in groups of two Finns and three Norwegians. The outlines were loose: they had to assign duties and collect their own materials. The Finns were instructed to try to organise the group work, as they were older than their companions. The aim was again to give a context and reason for communicating, this time in the form of a task they collaboratively worked to complete. The teacher's role inside the game was mostly done by the beginning of the lesson (preparing the map, assigning groups) and what was left during the class was to observe and facilitate the group

work. After the second lesson, the students were administered a language competences survey (see 6.1 below).

Some problems arose during the interventions, mostly technical issues related to game installations and school network. However, the direr problem was the lack of voice chat. While the Finnish school was prepared with microphone headsets, the Norwegians did not have the capacity for a voice chat for each student. Thus, the communication took place through the game's internal text chat.

Material was collected again in the form of a chat log and observing the lessons. In addition, a survey model for describing language learning in games was developed based on the CEF competences (see 3.3.3 above) to answer the second research question.

Next, the methods use for collecting and analysing data will be discussed in more detail.

4.2 Methods

The present case study employs a mix of quantitative and qualitative methods to analyse the data and to answer the research questions. Qualitative research is often defined in its relation to quantitative research; the focus is on the words rather than their numbers. Beyond this barest rudiments-definition there is an epistemological difference, i.e. how we perceive knowledge. Qualitative research involves a level of interpretation; unlike the natural scientific model that observes phenomena through direct sensory experiences, interpretive approach focuses on "understanding the social world through an examination of the interpretation of that world by its participants" (Bryman 2012, 380). According to Mason, the strength of qualitative research lies in the ability to answering the question *how things work in particular contexts?* Whereas

quantitative research often disregards context and complexity as inconvenience, qualitative research aims to look at specific questions to answer more general ones. (2002, 1.)

Instead of just relying on a single, specific method to gather data, multiple outlets are employed (i.e. observation, blog posts, chat logs and survey data). This approach is referred to as *material* and *method triangulation*. In essence, the aim is to improve the confidence in the findings. For example, if the observing researcher is unsure of their interpretation of a situation, they can use interviews to validate their hypothesis. In the first intervention, blog posts form the main data that is supplemented using the chat logs and observation data. In the second part, the main data consist of survey data that are supplemented with observation data from the interventions.

4.2.1 Survey and Likert-scale

Two surveys form the backbone of exploring the language competences in the second intervention: the first one dealing with the competences that are trained when playing games and the second to investigate the gaming practices of the respondents. Surveys and questionnaires, as Denscombe describes them, are economical and easy to arrange and supply answers in a standardised format (2010, 169). They are economical in the sense that they require little time to administer and produce relatively large amounts of data. Answering a survey also takes less time and less effort to organise (compared to an interview). The fact that all the respondents answer the exact same questions ensures that wording or personality issues with the interviewer will not have an effect on the outcomes. In the case of multiple-choice questions, they also answer in the same format, making data processing easier. However, limiting the choices can also

be a disadvantage; respondents may feel restricted or frustrated by their choices being narrowed to a small number of options. (Denscombe 2010, 170.)

Both surveys are structured as statements and participants' responses are measured on a Likert-type scale. A psychometric tool, Likert-scale tasks the respondents to evaluate their stance to the statements on a five point scale: they need to decide whether they disagree strongly, disagree, nor agree nor disagree, agree or strongly agree. The responses are scored, ranging from strongly disagree (1) to strongly agree (5).

There are many ways to visualise a Likert-scale. Out of the available choices, Robbins et al. recommend using stacked bar charts (2011, 1060). For the purposes of the present study, a 100% stacked bar chart was selected as it offers an at-a-glance impression of the dispersion of responses between the categories. A stacked bar chart was for example selected over grouped bar charts because it makes it easier to make comparisons between different items whereas grouped bar charts draw the attention to the distribution of answers within a single item. One of the reasons to select the horizontally stacked bar charts is that they also portray well the original survey form, where, after each item, the scale is portrait as spots on a line disagreeing items on the left and agreeing on the right.

The Likert-items are usually presented as statements. While designing the statements follows most basic rules of survey questions, there are some points that should be considered especially with Likert-items. First *double-barrelled statements* should be avoided. This kind of statements actually survey two attitudes and it might not be clear which one the respondent is replying to (Johns 2010, 3). One such item might be "I learned how to be polite and made new friends". With this kind of statement, it would be impossible to know whether the respondent agreed with being

polite or making new friends, both or neither. Secondly, *quantitative statements* can significantly lower the validity of the responses. Quantitative terms such as *always* or *too much* may cause ambiguity (ibid., 4). Consider the statement: "I always knew what phrase to use". What if the respondent had one moment during the course when they did not know the appropriate phrase? Should they disagree with the statement? Lastly, it needs to be considered how *leading the questions are.* By nature, Likert-statements are leading; they present a statement to the respondent who then expresses their opinion. The problem here is that people have a tendency to respond positively to questions. It is referred to as *acquiescence bias*. To counter the bias, some items can be presented as negative, opposite statements. Rather than stating "playing the game was exciting" the reversed statement can be used: "I was bored when playing the game." These *negatively keyed* items need to be reversed when analysing the results. (ibid., 4-6.) These guidelines were followed when designing the statement for this survey as well.

The items for the survey were formulated based on the descriptions of language competences (see 3.3.3 above). Each sub-competence was expressed in layman terms to show how they would be manifested in everyday classrooms. All of the competences and their corresponding survey items can be seen in Appendice III and IV for easier comparison. Even though CEF claims to be not only aimed at professionals, many of the descriptions use at least a level of jargon beyond the comprehension of an upper secondary school student. That is why it was deemed necessary to paraphrase them into easy-to-understand statements the participants could relate to. For example,

Politeness conventions

- I had to consider how polite I was to other players.

Intercultural skills and know-how

- I had to take into account the other person's culture.

Of course it needs to be addressed that creating the statements add a level of interpretation from the original competence descriptions. All of the statements are the researcher's interpretation of the competences and, despite the intention and care taken, may emphasise different aspects than some other researcher would have. However, the compromise between intelligible statements and fidelity to the original description was judged necessary to produce more valid data (so participants understand what they are replying to). Four competences were left out either because they very closely resembled some other category or because they were unlikely to occur during the gameplay. The exluded competences are *knowledge of the world, semantic competence, linguistic markers of social relations* and *register differences*. At the end, there were 19 survey items, that the participants answered at the end of the second intervention after playing with the Norwegian students.

In the analysis chapter, the results of the Likert-survey are graphed to stacked bar charts, summing the response by statements. Later, a sum score is calculated for the groups of competences.

4.2.2 Observation

> I once observed a French lesson, part of which was taught entirely in French, with plenty of rapid-fire interaction between teacher and pupils. I was studying individual pupils in the class, so I kept note of who answered the teacher's questions. After the lesson I asked the teacher to say roughly how many pupils had given an oral answer to her questions. 'Oh, I don't know, there were lots of hands in the air,' she replied, 'I think most of them did. About twenty to twentyfive, was it?' The answer was eight. (Wragg 1999, vii)

Whereas interviews and surveys rely on self-reporting for their material, observation as a method can overcome problems associated with them, like Wragg's quote above aptly demonstrates. Subjective self-reporting can be biased and inaccurate, while external observation may provide complementary data (Borg & Call 1983, 466). In the present study, observation is used to supplement the data gathered from other sources in order to create a more holistic view of the phenomenon studied.

Literature makes a difference between two kinds of observation: structured and unstructured. Structured observation is often associated with quantitative research, as it aims to define structured categories for observation. (Kothari 2004, 96.) This notion aligns the method in positivist worldview; knowledge about the world can be gathered through direct sensory experiences. On the other hand, the unstructured observation is more interpretive, as the researcher makes inferences based on their experiences. (ibid., 97.) However, the categorization between structured and unstructured observation is linear rather than polar. The continuum between the two ends can be measured on a scale of inference of the observed categories, i.e. how much interpretation or evaluation is required to make the observation.

When using observation as a method, the effects of the observation on the situation must be considered. Do the students or teacher behave differently when they know they are being observed? The phenomenon, referred to as observer effect, should be considered and its effects reduced as well as possible. Borg & Call (1983, 481) list a number of steps to that effect:

- No observations should be made immediately after entering the room. The underlying hypothesis is that over time, the students and the teacher will pay less attention to the observer.
- Prepare the students for the observation. If the students know about the study beforehand, their curiosity is likely to be lower.
- Observe the class multiple times. As stated before, the novelty of being observed should subside over time.

In addition, we need to address *the observer bias,* i.e. how the observations are affected by the observer. As opposed to "true errors" which appear randomly in the data, *biased observations* always skew the data in the same direction. (Goodwin 2009, 458-460.) They are impossible to avoid completely but they can be greatly reduced given that the observer takes proper precaution.

In the present study, an unstructured approach is adopted. As the function of observation here is to complement the surveys, blog and chat data, the observation is aligned to the main research questions. In the first interventions, chances for observation arose during the three contact lessons. The observation data was collected as notes that were later organised into categories. In the second intervention, observation was carried out through all the lessons. Here, the observation were made in the form of notes and will be used in conjunction with the survey data.

The next chapter will present the analysis of the data from both interventions that was collected as described above.

5 Analysis

In the analysis chapter, I will discuss the outcomes of both interventions in detail and point out the interesting details and patterns in the data. I will also explain the data in relation to the context in the classroom and to the research in general.

5.1 First intervention

Here, I will describe the first part of the study, analysing the students' experiences based on the blog posts and observation data. Parts of the analysis have been already published as part of the Active Learning Spaces project (in Uusi-Mäkelä 2013).

5.1.1 Blog posts and observation

After reading through the blog posts, five main topics for the posts emerged: presenting what the students had built, collaboration with someone else, describing the building process, learning something new and what kinds of problems they had had. All posts in the blog fit at least one of these categories, often multiple.

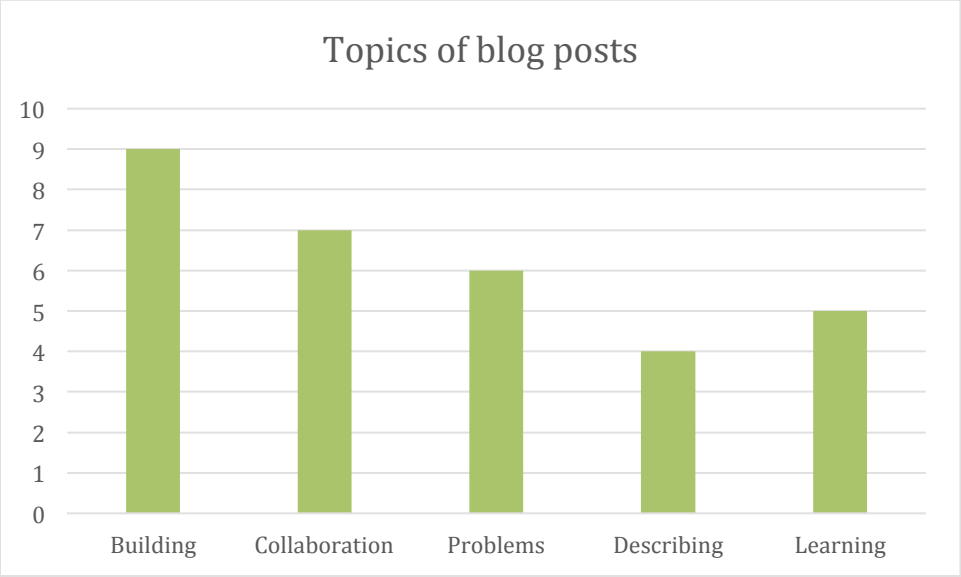

Illustration 11 Blog posts divided into different topic categories.

Perhaps unsurprisingly, most popular topic for the posts were the building projects. Posts that were categorised here either directly described the buildings or were accompanied by screenshots or videos about them. The building project varied greatly. The initial enthusiasm sparked novel buildings, such as lava-lamp building and ad-hoc Berlin Wall to separate two groups of players. However, while the teacher attempted to guide the building projects to a more coherent direction during the contact lessons, they were mostly built by single students or a small group of players.

Almost equally frequent were descriptions of collaboration with someone else. As an open virtual world, Minecraft did not enforce collaboration. Rather, the students organically came together to cooperate on a project together, as evident from example 1:

(1) It started when I thought about making a huge water fountain. When I had placed some pillars of wood Antti came and asked me what was I [sic] doing I told him I was building water fountain and he started to help me out. When the woodblocks were placed Joonas came up after problems with getting minecraft working and started working with us. After we got the water flowing correctly we thought that it looked bit dull so we decided to but glass around it so it would look more like a building. [student 4, post 2]

Figure 1 The lava-lamp house described by a student above.

What is notable is the emergent nature of collaboration - all communication and cooperation in the game was student-initiated. Considering the important role of authenticity in language learning (see 3.3.1 above) this is indeed something that could benefit teaching practises.

Problems were mentioned in six blog posts in total. Most of them concerned connectivity issues to the multiplayer server. The game world could not be accessed from outside the school. While this was a known issue at the beginning of the course, many students would have liked to play the game from home. Bearing in mind games are usually a spare time activity this is understandable - the logical place to play them from would be home. But since we are talking about bridge the gap between formal and informal learning the fact that the issue arises so often is interesting. We often attribute the low usage of games to teachers' reluctance (Opeka 2015) but it seems that a foreign environment might be an issue for the students as well. They are used to

playing games at home so transferring to playing them at school may be a change they need to adjust to as well.

One less frequent but all the same interesting aspect was students describing the building process itself in the blog posts. Writing them, students had to describe their own work using the target language. Having to describe one's actions and surroundings is an essential skill from the point of view of language learning (see Pihkala-Posti & Uusi-Mäkelä 2013). As importantly, writing the entries, students were coaxed to reflect on the gameplay and what they might have learned. This aspect of awareness might just be the key to tie the sporadic and dynamic nature of informal learning that happens in games with the settings of formal learning.

In five blog posts students described the learning process itself. Majority of them concerned learning new aspects of the game, for example how to craft new items in the game using the resources the player has gathered from the environment, like in example 2.

(2) […] in Minecraft I have been doing research on redstone and how it works. I have created many contraptions and hopefully in the future I'll get better at creating them. It's quite interesting since it's pretty similar to the way how electricity works. Hopefully I'll get past my baby steps and get on track by getting to play online.

[student 7, post 1]

While this might sound pointless or even counterproductive from language learning point of view, the students are actually practicing many important skills like information retrieval. Moreover, it is an aspect of informal learning - learning that happens freely within the game. Additionally, if you consider how they come across the information the ties to language learning become obvious: they either find the

information they are looking for online (usually using English) or by speaking with other students, encouraging them to communicate.

Some students also suggested how the course could be developed further. Most of them were happy with the selected games but wished there were more contact lessons. There were two kinds of reasons for this: firstly to facilitate the process of learning the games. Despite the common belief that the younger generation is naturally proficient with everything digital, it seems they still require some scaffolding like one students put it: "Another tip for the next year is that make up more meetings so people will get to know faster how to play the games." [student 2, post 4] Obviously, if more time spent on learning the game results in lower threshold for students to start playing and less frustration, it is something to consider when planning the use of games in school. Secondly, students thought more contact teaching would make the gameplay more collaborative and focused. Like Oksanen points out, there is a need for a teacher in game-based learning as well (2014, 16-18), not necessarily as the source of knowledge but as a facilitator. While the students might have the technical skills to build whatever they want, they do not possess the skills to organise a group to collaborate on a project. Perhaps when using games, the role of the teacher is transitioning from sage on the stage to guide on the side, as the common proverb has it.

Lastly, aside from the listed categories there were many expressions of excitement and engagement, like this student describing their constructions (see illustration 12 below):

(3) The woodhouse in front of picture is enchantmen [sic] room. The lava building behind the enchantment room is supposed to be a beacon but I think it should be little bit bigger to work. We have also our own ship where we can spend our time. The big tree in middle of picture is house, believe it or not! I found out that

> Minecraft is enjoyable game and I like it very much so we decided to spend our time in good way and do lots of homework because in this course homework was actually pretty fun!
> [student 1, post 6]

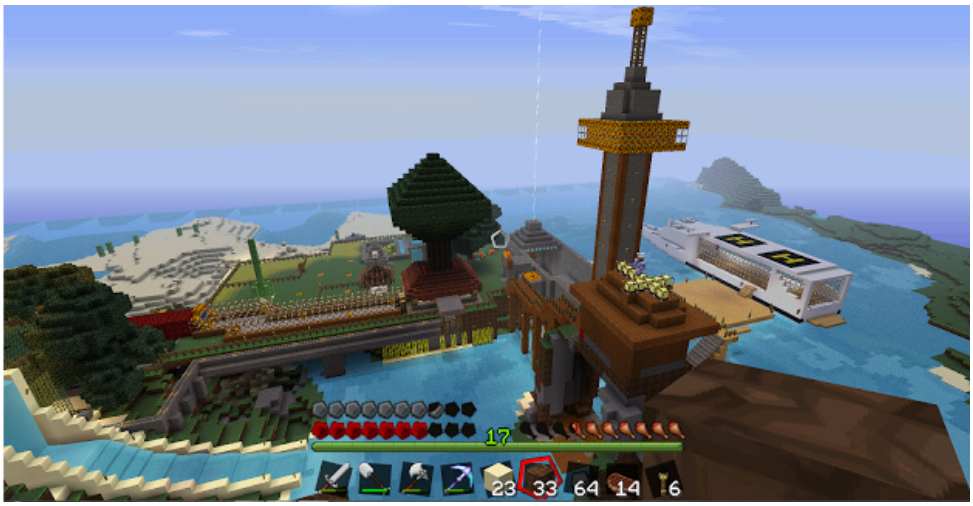

Illustration 12 The buildings student 1 is describing in MinecraftEdu.

Putting aside the question of how much and what kind of learning took place, the engagement is something to consider on its own. If the students are so passionate about something it gives the educators a lot of leverage: if they can point out that the skills that the students learn in schools are useful in the game, there is an authentic motivation to learn them. Moreover, the findings suggest that the familiar features of gaming like engagement and excitement are not lost completely when transferred to a classroom environment.

5.1.2 Points of iteration

As a dynamic virtual world, the Minecraft server was open outside of lessons, too, and students were encouraged to play on their own time. However, this resulted in many players resorting to Finnish, at least occasionally (which is of course the case in

traditional language teaching classroom as well). Although the blog posts were written in English and provided a chance to practise the target language, the aim was to communicate *in the game*, not just *about the game*. Of course in hindsight, this is natural: there was no authentic need to communicate using the target language so the students switched over to Finnish. There are of course ways to remedy this. Unlike many learning games, MinecraftEdu allows for strong teacher presence in the game, and the lesson learned was that the teacher of the course should visit the world more often, as their presence seems to reduce the amount of non-target language use.

Alternatively, to provide environment for truly authentic communication, the use of target language should not be an enforced option but necessity arising from the context. To achieve this, the students should be playing with someone with whom they cannot resort to using their own language. Creating a multicultural setting for the game would then hypothetically improve target language usage. Still, this type of project, restricted to students' own classroom, can serve as a stepping-stone for cross-cultural projects in the future (see for example Pihkala-Posti 2014 and Pihkala-Posti manuscript 2015). As mentioned above, it also serves an important role in introducing the game as a medium and modes of operation therein, as their mastery cannot always be taken for granted.

Also, as the students pointed out, adequate time should be invested to learning how to play the game. Considering this was an elective course and many of the students were frequent players, this is even more important with a regular group of students.

The feedback and results of the first intervention were used as the basis for designing the second iteration of the course next year. The results of the second intervention are presented in the next section.

5.2 Second intervention

The second intervention took place November and December 2014. The students played with a group of Norwegian students and after playing they were administered a survey to chart what areas of language use are practised when playing games. They also answered a background survey about their gaming habits and history, especially with Minecraft.

In this section, I will first take a look at the results of the background survey and how the participants' gaming habits compare to population in general. Next, I will present the analysis of each language competence survey item, trying to understand, interpret and explain the answers all the while relating them to the observation data. The items are separated into general learner competences and communicative language competences and further into sub-categories. At the end of the section, the individual competences will be analysed in groups (e.g. *practical skills and know-how* and *intercultural skills* grouped together as *skills and know-how*).

5.2.1 Gaming background

Compared to general population, most of the participants were active gamers. The median time spent playing games weekly was 10 hours while the average was a little higher (14.75h). In comparison Finnish people play 4.86 hours per week on average while the median is two hours (Mäyrä & Ermi 2014, 24). That is not to say all of the participants spent as much time, there were some outliers: the least playing two played 0.5 and 5 hours per week where the most active gamers respectively played 28

and 30 hours. While not necessarily representative, the group most certainly was not homogenous.

The Minecraft experience of the players varied significantly, too. There were veterans of 400 hours and players with their own servers and experience of modifying the game. In contrast, a few people had only tried the game and some only played the single player mode (as opposed to the multiplayer mode). Interestingly, despite their different gaming backgrounds they all signed up for the course as an extracurricular activity. It suggests that games motivate more than just the enthusiastic gamers who spend their spare time with game already.

5.2.2 General learner competences

The first nine survey items dealt with the general learner competences; the skills that are not directly linked with language production (cf. 3.2.1.1 above). The results of the Likert-scale items were plotted into stacked bar charts to better present the results in a visual manner (illustration 13).

There are some interesting results in the first set. First of all, contrary to what might be expected, the students did not report to have learned about a foreign culture (70% disagreed to an extent with the statement). This might have to do with the short periods of play; the two groups only played together for two lessons. However, on a meta-level the reason might be more complicated. Often when people meet in games, the very first discussions often revolve around the game itself. Only after playing for a while do people start talking about topics unrelated to the game. A longitudinal survey is necessary to determine whether there would be a measurable change in the players' perception of cultural exchange.

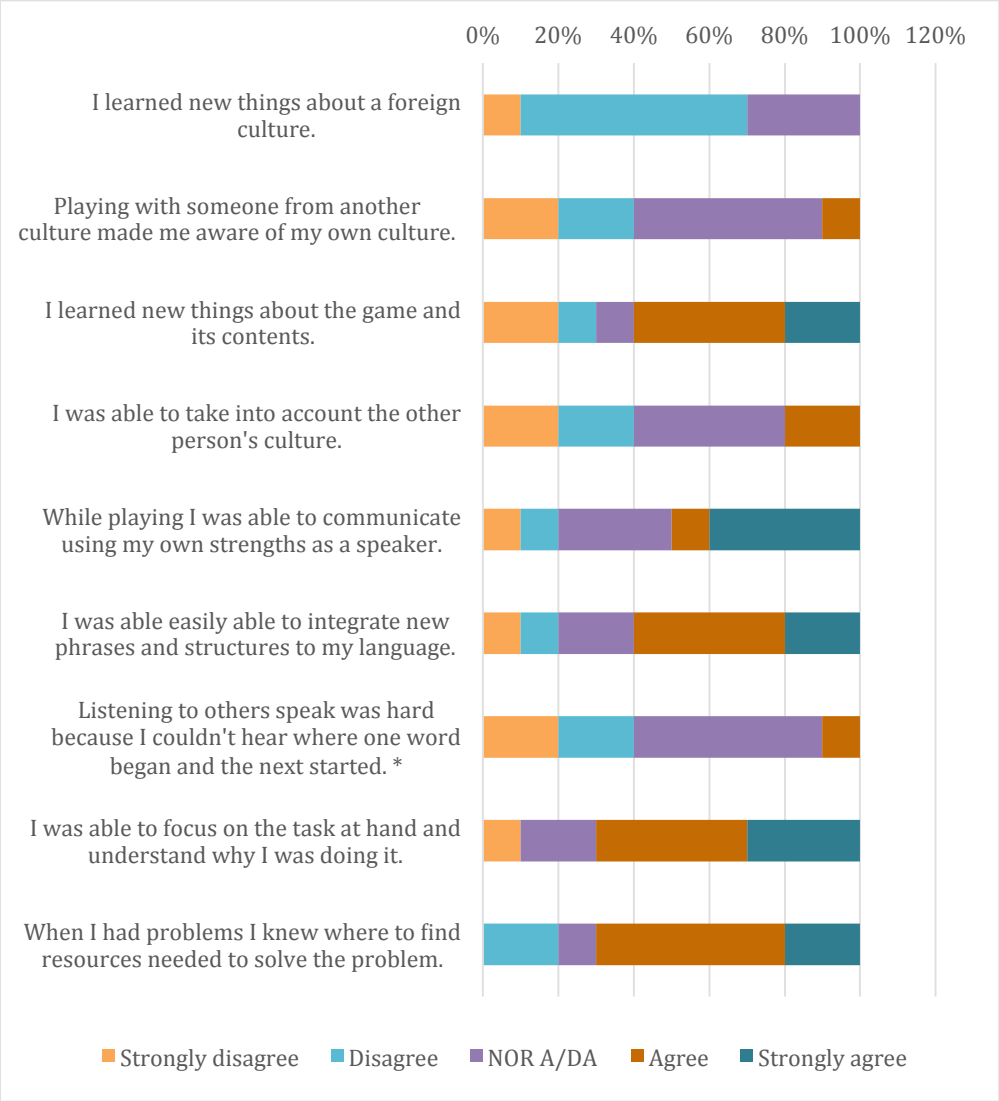

Illustration 13 Answers to General Competences. Negatively keyed items marked with *

While the response was less dramatic, more respondents disagreed than agreed with the statement that they had become aware of their own culture while playing with someone else here as well. The gaming sessions were structured around Norwegian culture so, were the Norwegians to be asked the same survey, they might have responded differently. Another noteworthy detail is the large number of unsure respondents (50%). As described above, the students played independently while the teacher's role was limited to structuring the gameplay. These facts raise the question would a more direct teacher role have made a difference. Additionally, it needs to be

stressed the answers are self-reports of cultural awareness; despite the fact the students did not feel they became more aware of their own culture, on a subconscious level they might now be more prepared to talk of their culture in the future. (see Kaikkonen 2001). This of course is a limitation of self-reporting and needs to be confirmed using other methods.

Not surprisingly 60% claimed that they learned new things about the game. While the fact itself appears insignificant from the point of view of language learning, the manner of learning is more interesting. As mentioned above, Minecraft itself provides next to none instructions and the players are left to their own devices to look for information. There are three possible sources where they can learn new things from: experimenting by trial and error, researching from online resources or by asking for assistance from someone else in the classroom or using the game chat. The observation reveals that majority of the cases fell into the last category: the student either asked someone in their own class or a foreign student in the game. In many cases they chose the latter; albeit younger, many of the Norwegian players were experienced in Minecraft and proved a valuable resource for the students. Indeed, a typical scenario began from an exclamation:

(4) "How did they do that?"
[followed by a prompt from the teacher]
"Why don't you ask them?"
[exchange between student and teacher, lesson 2]

The opinions were more evenly divided over whether the players were able to take into account the other players' culture when communicating with them. There fact that there was an age difference between the respondents (10 to 11 year olds and 16 to 18 year olds) may have forced the older students to take into account at what

level their younger co-players could communicate. While not answering the question per se, it may have affected the outcome.

More than not, respondents felt they were able to use their own strengths when communicating in the game. Because the game was an open environment for communication they could choose how to best use the language. This is important for the students' motivation; feelings of succeeding as a communicator set them up for future success. This does raise the question whether the game provides affordances for using their own strengths more than in usual classroom work. A virtual space does combine more modalities and options to use their strengths (text, movement, audio, see Pihkala-Posti 2014) than many other environments and materials but given the restrictions of the current study, this remains a question for future research.

Likewise, it seems to have been easy for the respondents to integrate new language items into their communication. In the context of a game, it seems likely these new phrases and structures were mostly related to the game, as evident from the following exchange (example 5) in the chat:

(5) "What do you call that thing where you combine things?"
"Workbench"
[exchange between students, lesson 2]

Then again, there were situations where the students asked one another how to express something in English before writing it in the game chat. A follow-up would be necessary to accurately determine what they were referring to.

As described (see 4.2 above), there were problems with the planned audio connection between players. Consequently half of the respondents chose the neutral option to being able to make out individual words from speech. There was an outlier who did think it was hard to distinguish between words but 40% did not have problems with understanding.

Concentrating on the task and understanding the reasons for playing was easy for 70% of the respondents. This aligns well with theoretical background; games are motivating tools in the classroom. Indeed, after playing with the foreign people, there were always a number of people remaining in the class who wanted to keep playing and asked if it was possible to continue at home. This further fortifies the motivating role of games as motivational tools.

The analysis of learning about the game and looking for information above is further reinforced by the 70% of respondents who knew where to look for advice when they needed it. As mentioned above, the typical patterns revolved around informal learning: in case of trouble most of the students asked other people whom they were playing with. However, there were cases where they looked for information online: most of these inquiries went through Google; in minority of the cases the students went directly for a specific resource, such as Minecraft-wiki.

5.2.3 Communicative language competences

There were ten statements about communicative language competences. Like above, they were plotted in the bar chart.

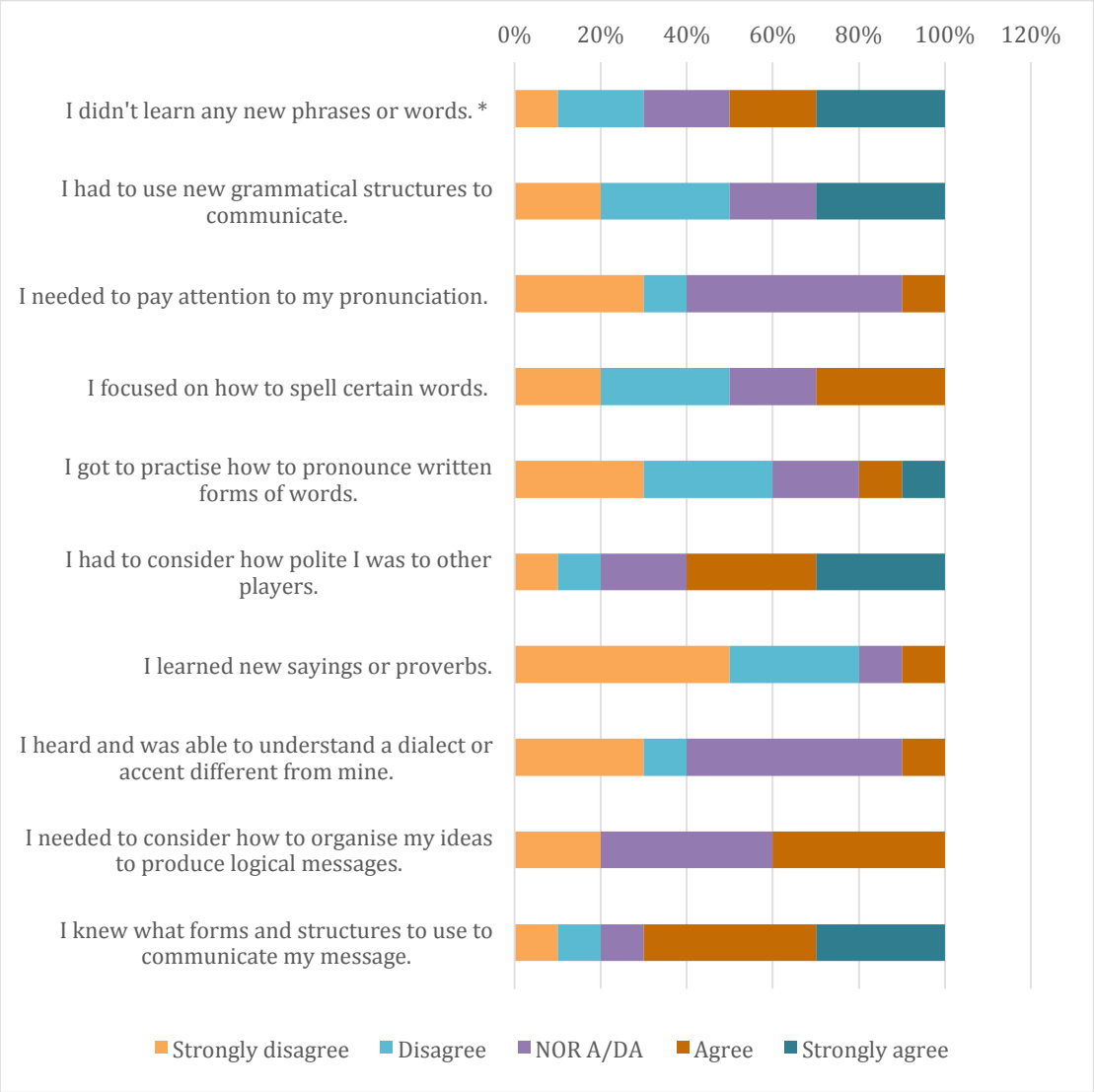

Illustration 14 Answers to Communicative Language Competences.

The statements in the second set were more directly connected to language use, as evident by the first statement about learning new lexical items. 30% of the students reported to have learned new terms and 50% that they had not. Again, we are discussing self-reported learning, so not everything they learned might necessarily be covered in the students' responses. Considering the straightforward nature of the question, it is somewhat surprising that 20% choose not to agree or disagree. It could be speculated that while they learned new game terminology they might not consider it proper enough language to warrant a positive answer. Research supports the claim,

at least partly: Bragg found that students greatly undervalue games as learning tools and their responses to surveys were in stark contrast with observation and interview data (2007, 40). This of course remains conjecture in the lack of subsequent data on the attitudes of the participants of the current study.

The answers were almost equally divided regarding the use of new grammatical structures. This time 30% agreed strongly compared to 50% who expressed at least some level of disagreement. While it seems reasonable to assume that players can acquire vocabulary from the game, picking up new grammatical structures appears a more complicated process. In the observation data, there were cases where students asked one another how to ask something. These exchanges may be the source of these "new" grammar forms, although it does seem likely that they were more reminders than actual incidents of novel forms. Despite the responses, they might have practised existing grammatical structures that would still be considered practising their grammatical competence.

Because of the problems with the voice chat, the vast majority chose they did not need to pay attention to their pronunciation or neither agreed or disagreed with the statement. The same applies to pronunciation of written forms of words. Similarly, although Finnish and Norwegian English are quite different from one another, only 10% responded to have heard and understood a dialect or accent different from theirs.

Apparently spelling words did not pose a problem to half of the students while 30% had to pay attention to their spelling. Spelling is often the theme of the first generation of learning games (see 3.2.1 above) but it does not mean spelling would not improve in the more advanced games. As text-chat is the default form of communication in Minecraft, it would seem feasible that over extended periods of time, spelling would improve as well. However, as Hausrath points out there is no

language feedback system in the game (2012, 8). Consequently there is nothing stopping a player from spelling a word incorrectly except the other players and the social setting (much like in real world, one might argue). Then again, this is something the teacher could address, but a challenge lies in making this unobtrusive to not interrupt gameplay at every incorrect spelling.

Sixty per cent of the respondents reported they had to consider how polite they were when communicating. The students made a lot of jokes beforehand about playing with Norwegians. When faced with the situation they actually had to communicate and play with them they concentrated much more.

The majority of the students reported that they had learned no new sayings and proverbs – only one reported having learned new ones. The results does not come as a surprise; there were not many potential sources of new sayings in the game as the Norwegian players were younger and less adept in English. Having said that, there is an instance in the observation notes where the students discussed would a Finnish saying work in English ("When hell freezes over") so perhaps a differently phrased item would have yielded different answers.

The statement that was constructed to measure pragmatic competence received a much divided response: 40% agreed that they needed to consider how to organise messages to produce a logical message while 40% neither agreed nor disagreed and 20% disagreed strongly. The different responses may reflect differences in skills but also the nature of communication: much of the exchanges were relatively short, usually giving directions or asking for confirmation.

Seventy per cent of the students reported that, to a degree, they knew what forms and structures to use to communicate their message.

5.3 Summary of categories

After looking at the general and linguistic competences and their implications in detail I will collate the individual competence statements together to represent the main level competences. The negatively keyed results were reversed to match the rest of the items.

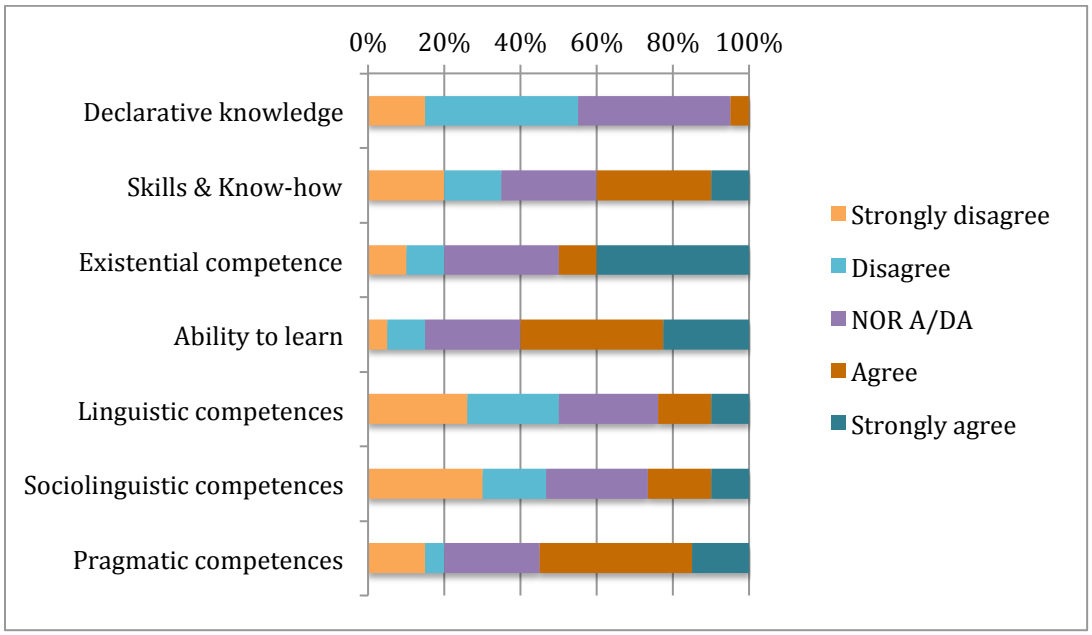

Illustration 11 Summary of competence categories

As was the case with individual competences, the main level competences are heavily divided. Whereas declarative knowledge garnered only 5% positive answers, 60% of the respondents agreed with the statements about the ability to learn. It needs to be pointed out that there are different numbers of competences in each category; in most categories there are two or three competences, existential competence just comprises of one competence and linguistic competence encompasses five. As such, the variation between individual categories within the main competences can muddle the results to an extent.

Aside from the low share of positive answers to statements about declarative knowledge, it is notable that there were only a few outliers. The extreme answers were scarce: three strongly disagreed, none agreed strongly and 40% of the answers were neither agreeing nor disagreeing with the statements. The high share of neutral answer can be interpreted in multiple ways: it could signify undecidedness, insufficient knowledge on the subject or simple treated as a point on the continuum from disagreement to agreement (Garland 1991, 66-67). Obviously the interpretation is context dependent and I will entertain all options here: undecidedness could stem from mixed positive and negative experiences. Insufficient knowledge here could be interpreted to mean that the respondents had too little experience to have a strong opinion for or against the statement. Perhaps in a longer term study they would present more polarised opinions. Lastly, a contrary view to both previous analyses is to treat the neutral category as another point on the continuum between total disagreement and agreement. As such, it is not neutral or undecided. Following this interpretation, respondents could be thought to have practised some declarative knowledge, not extensively but not absent either.

Forty per cent of the replies to skills and know-how were positive – 35% negative. This strong division is due to the very different reactions to the two statements comprising the category. What it demonstrates is the broad range of skills the competence encompasses. Practical skills and intercultural skills that fall under the category are quite dissimilar - other deals with daily skills and the other rather abstract concept of intercultural abilities. Thus, categories with few questions can produce dramatic results. Case in point: half of the responses to existential competence were positive. As stated above the category only includes one competence - the implications were already discussed above.

It seems the students were fairly confident in their abilities to learn: there were only six disagreeing responses to the four items under the category. It does make sense considering the nature of the game: as described above Minecraft relies heavily on the players' abilities to either find resources outside the game or learn things on their own. These skills are also at the core of the new national curriculum in Finland, the skill being integrated to multiple subjects from biology and mother tongue to foreign languages. In English as a foreign language, the students should be "actively encouraged to look for information in and using English". (Opetushallitus 2014, 398.)

In linguistic competences the answers were evenly divided into four sets: almost a quarter disagreed strongly, another quarter disagreed, another did not agree or disagree and the last fourth agreed or agreed strongly. The even division of answers going from one competence to another in linguistic competences would suggest that there is great individual variation among the respondents. For some of them, playing the game seems to train their linguistic competences whereas some do not feel they were practicing the skills. A deeper comparison between the individual answers and gaming background did not reveal any patterns: both beginners and experienced gamers responded both negatively and positively. The reason for the variation requires more detailed study.

Many of the students reported to have practiced their pragmatic competences; the skills that deal with the ability to arrange language into context appropriate order that conveys the intended meaning. Given the structure of the tasks this makes a lot of sense: the students were tasked to plan and build a project in the virtual world together with the foreign players. The type of communication these kinds of tasks require could be characterised as task- or goal-oriented communication that has traditionally been considered characteristic of computer mediated communication. Although more

recent research has shown that task-oriented communication is just one aspect of communication in games, it remains one of the obvious markers - after all, games themselves are structured around tasks. Returning to the case at hand that was a short-term intervention, majority of the communication revolved around the tasks themselves that seemingly explains the strong response to the category.

Conversely, the response to sociolinguistic competence was relatively low - only one in four answers was positive. To continue the idea of task-oriented communication, it would seem that, consequently, not a lot of energy was directed to the social aspects of the language; such as forms of address or folklore. Computer mediated communication is often characterised by a low level of hierarchy and sociolinguistic aspects of language might be less integral part of communication those contexts. Then again, games can be viewed as their own communities of practise with their own jargon and practices (Gee 2007). From the point of view of language learning it is of course necessary to acknowledge that the notion of sociolinguistic competence is culture specific; what is considered polite fluctuates from one culture to another. What, then, should be the stance to the social skills learned in games? If the politeness conventions of a culture or the cultural references are different in games, what kind of value is there in learning the sociolinguistic competences in games?

6 Discussion

After breaking down the results, we next move to discuss their implications to the research questions presented above. Before that, the restrictions set by the material and method need to be addressed as I discuss the validity and reliability of the study, taking into account the ethical principles of social studies.

6.1 Validity and reliability

First of all, it needs to be stressed that with such a small group, the study cannot offer definitive results of what areas of language learning games affect. Neither should they; the role of case studies is to pilot novel approaches and to raise questions for longer-term research. As such, the results can act as starting point for a discussion on the topic and whether this kind of self-reported survey approach is a feasible method for evaluating what competences are trained. For a case study such as the present thesis, discussion about validity and reliability is essential.

Validity by definition is the measurement of how well the methods measure or data represent what they are supposed to measure or represent (Newman & Benz 1998, 32). It can be further broken down[3] to internal and external validity. Internal validity measures how well the researcher is able to forge a causal link between the data and the conclusions they make. External validity on the other hand is the extent to which the results of the study can be generalised to other contexts.

When it comes to evaluating the internal validity of the current study, the validity of survey items needs to be addressed first. The survey items are the first step

3 There are other categorizations such as test validity and face validity. For the purposes of the current study the most important factors can be addressed under internal and external validity.

of abstraction between the respondents and the language competences that are being measured. How well do the items represent the competences they are meant to represent? The items were primarily formulated based on the descriptions of the competences in Common European Framework of Reference but also other sources that sought to interpret the document for practitioners (Bailly et al. 2002). As such, they aim to represent the items in layman terms that were intelligible for a high school student. Some of the descriptions were multifaceted or covered very broad concepts and consequently some compromises were made. Thus, instead of encompassing all aspects of a competence, they aim to represent an instance of the competence in the specific context of the study. Retrospectively, some of the statements might have been oriented differently: for example, the choice to ask students whether they learned new grammatical structures could have been positioned to ask whether they practised existing ones. Regardless, they measure different sides of the same competence and provide valuable information as such.

Another aspect to consider is the subjectivity of the answers; the participants may not recognise when they are practising a competence despite the simple statements in the survey. This was partly addressed by observation that sought to provide an additional point of view alongside the participants' self-reported learning.

Secondly, any inference made from the data (i.e. not directly observed) is threatening the internal validity of the study. Both the current and the analysis-chapter above have sought to understand and explain the results in their context. This is inherent to any study that seeks to explain phenomena and is best countered by addressing rivalling explanations (Yin 2013).

External validity of a case study is an interesting question. Denscombe grants that a case study can be generalised to an extent, given that it is conducted properly

(2010, 322). Obviously any generalizations need to be done cautiously; a study that is conducted with a small sample in a specific context can offer a perspective to the research questions but hardly conclusive evidence.

In general, the choice of method can create validity issues as well. Surveys, while productive and efficient, lack the dynamic interactivity of, say, interviews. If there are interesting trends or discrepancies in the responses there is no way to investigate them further. This point was acknowledged when designing the study setting and observation data was collected to facilitate interpretation of data. In hindsight, more structured observation (cf. freeform note-taking) may have benefitted the accuracy of the study. However, observation did prove useful and provided necessary context for many of the survey items. Methods such as individual interviews might have provided broader data but given the specificity of the topic survey items were deemed more practical. Indeed, researching informal learning that is often unconscious, more open approach might have yielded less accurate data. Still, given the opportunity, follow-up interviews could have provided clarification to some of the questions left open in the analysis.

Measurement of how accurate and replicable the study is determine the reliability of the study. This is sometimes considered problematic from the point of view of case study is deeply rooted in practise and in the given context and in the given time. It need not be: considering reliability from the point of view of replicability, if we can provide full descriptions of the procedure and the steps taken, the research setting can be repeated in other similar settings. (Yin, 2013.) Assuming case studies are admitted any level generalizability then the research settings should be transferable to other settings as well. Granted, no two settings will ever be identical when it comes to social studies, but as Riege points out “possible differences also can

provide a valuable additional source of information about cases investigated (2003, 81).

6.2 Ethics of the study

The current study has been conducted to comply with the ethical principles of social studies (Descombe 2010, 330-338). Utmost care has been taken to ensure that it

- protects the interests of the participants;
- ensures that participation is voluntary and based on informed consent;
- avoids deception and operates with scientific integrity;
- complies with the laws of the land.

These principles are also in line with (and in some points extend) the guidelines set by the Finnish Advisory Board on Research Integrity. The current research did not cause harm to the participants' personal safety and the questionnaire was collected using a secure, widely accepted tool. The data containing personal information were not handled outside this environment and exported data were anonymous. The participants also choose to take part in the study neither directly or indirectly; neither course was compulsory and was not graded (except pass/fail in the case of the first sample) to guarantee validity of the data. The participants also had the possibility to contact the researcher via phone and email for more information about the study. They had a clear idea what the goal of the research was and the point was discussed over research period repeatedly.

6.3 Research questions

At the beginning of this study we determined two research questions:

1. What problems are there in using collaborative multiplayer games in the classroom?

2. How can we determine what parts of language are trained in this kind of games?

To answer the questions, two interventions were designed. In both cases, upper secondary school students played MinecraftEdu as part of their English studies. In the first intervention, they reported their experiences on a blog and in the second one by answering a survey about language competences.

The first intervention provided an important point of view to the realities of using games in a classroom. It is worth pointing out that the results are specific to the particular course and game but provide valuable insights into using similar games in education in general.

The feedback highlighted the need to spend time to familiarise the students with the game as a medium. Even though they might have played games before, getting used to a new environment takes time, especially with a game like Minecraft where the game itself does little to scaffold learning the concepts and controls. However, when the game is familiar to at least some of the students, their expertise could be utilised to teach the beginners. This would also create a chance to use the target language to teach them how to play the game. Related to this, some blog posts highlighted the need for a more structured experience. While some emergent collaboration seems to arise from freeform building, there seems to be room for more structured projects as well. Perhaps they could be used as a starting point for collaboration while the subsequent activities could be less structured.

From language learning point of view, the results were two-fold. On one hand, the students were eager to write about their experiences on the blog and, since they were written in English, it provided an ample opportunity to practise describing their own actions, decisions and work - all of them important skills. On the other hand, the

communication language in the game often switched over to Finnish when playing outside of lessons. Perhaps the most important point that arises from the first intervention was the importance of creating an authentic communication environment for using target language. It seems like the gameplay experience suffered at times from the superficiality of target-language use in the game situation. Of course, there are other ways to approach language learning in the game (using gameplay for inspiration for creative writing, embedding target-language material in the game etc.) but if the focus is on leveraging the game as a communication environment it is important to provide an authentic motivation for using the target language.

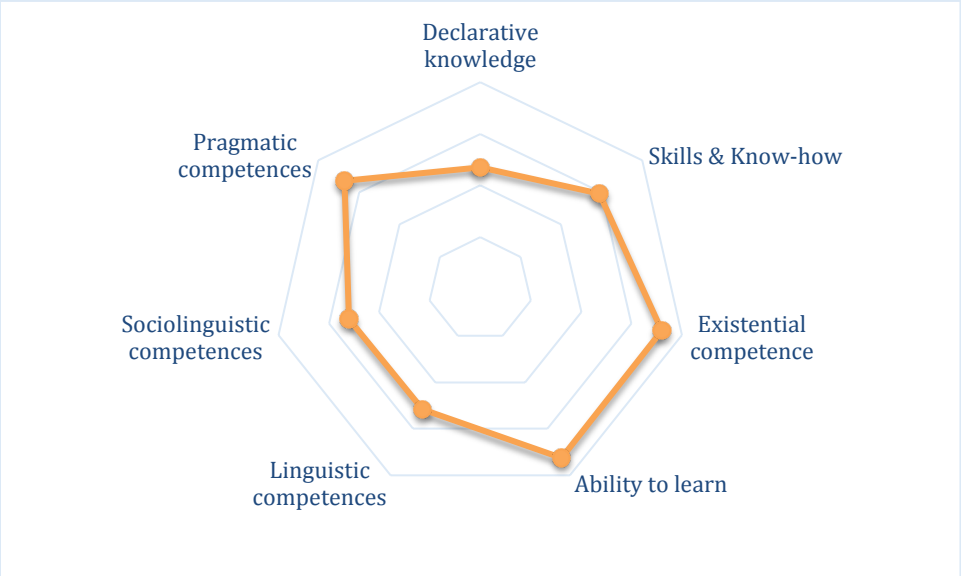

Illustration 15 Competence groups in a radar chart.

The aspects of language use that games train also determine how well they fit the context of language teaching. For example, if they train areas that are already covered, what is the point of using them? Thus, in answering the second research question, we will be partly answering the first one as well.

Based on the observations and the analysis of the survey we can address the second question with some confidence. A survey was developed based on the competence descriptions of the Common European Framework of Reference for Languages. The survey statements aimed to measure how much a particular competence was used during the interventions. As can be seen from the above radar chart (illustration 15 above) pragmatic competences, ability to learn and existential competence rise above the other competences in the students' answers. Almost as distinct is the low scores of declarative knowledge, linguistic competence and sociolinguistic competence. The fact that linguistic competences, the traditional bread and butter of language teaching, scored so low raises the question how well suited the game is for formal teaching. Of course, it needs to be emphasised that the results need to be taken in context and might be different in other cases. Also, there are educational settings where there are not as many restrictions such as extracurricular or after school activities where this kind of activities might find their place. These settings could be defined as non-formal, something between formal and informal education, as they are still organised activities but lack the restrictions of curriculum. However, much more interestingly, the new Finnish national curriculum emphasises project-based learning where two or more subjects are integrated into a single project (Opetushallitus 2014, 25). Perhaps, then, the future of formal learning could provide more opportunities to leverage games as well.

Conversely, it can be argued that playing the game supplemented areas that are traditionally not emphasised as heavily. Pragmatic, sociolinguistic and existential competences are all absent from the core areas that are usually trained in language teaching: communication skills and linguistic competences (Council of Europe 2012, 59).

Interestingly, neither sociolinguistic competence nor intercultural knowhow scored particularly high. I had expected the intercultural settings of the second intervention to have an impact on both categories. As suggested earlier this may be due to the short duration of the intervention and the restrictions of the communication media. However, it may also be symptomatic of the students' lack of awareness of their own culture and cultural differences. As Oksanen points out, teachers have an important role in facilitating the learning process and it might be the case here as well (2014, 18). A more structured activity could have yielded a more fruitful experience of the sociocultural encounters.

One fascinating aspect was that the students reported they practised a lot their ability to learn. Similar evidence was present in the blog posts of the first iteration. Information gathering and the skills to utilise different sources of information are important 21st century skills and they are emphasised in many national curricula as well. Perhaps games motivate the students to look for information like they would in their spare time. This of course would be an ample opportunity to hone those skills in formal education as well.

According to Egenfeldt-Nielsen "[t]he most serious flaw is, however, that the results [of studies of game-based learning] don't really measure computer games compared to other teaching, but rather as an extra supplement." (2007, 271). What if the setting he is describing is flawed? Why should games and traditional methods be

mutually exclusive? In the light of the findings of current study, games complement the shortcomings of traditional teaching in many ways. Where some might consider the term "supplemental" diminutive, it can be enriching existing ways of teaching instead of replacing them.

Of course, Egenfeld-Nielsen is right to demand rigorous studies on game-based learning. As he notes

> We need to raise the bar for educational use of computer games … It is hardly enough to establish that we learn from computer games, as this is essentially true for any activity we engage in. The real question is what computer games offer that set them aside from existing educational practice. (Egenfeld-Nielsen 2007, 272)

Keeping his question in mind, the results of the current study suggest that games in language teaching supplement the areas that traditional means of language teaching neglect.

An interesting question arises from how some of the survey statements were formulated. Both linguistic and grammatical competences were measured by asking whether the students learned new words or constructions. In hindsight, consideration should have been given to whether the game is assumed to teach new skills or practise existing ones. The statement for grammatical competence was formulated to measure whether the participants learned new constructions when playing. It would be interesting to see if the response was different had the question been about practising existing grammatical constructions and vocabulary.

Overall, the Likert-items used to measure competences seems like a useful tool and developing the method further could provide teachers and game makers with a tool to assess what language competences are trained. Obviously, there are always shortcomings when it comes to using self-reported data. The reports are always subjective and the students might not always be aware of when and where learning

takes place. Some of those deficiencies can however be overcome using additional methods like observation to supplement the data. The use of this kind of survey does not have to be limited to games either; it can be used to assess any tool, be they digital or analogue. After all, teaching a foreign language does not happen in isolation using one medium. Quite the opposite, by employing different tools language teachers can cater for different competences, including those usually neglected in by the traditional means of instruction.

7 Conclusion

At the beginning, we set out to explore how games can be utilised in language learning, what kind of challenges there are and what areas of language are trained while playing games. MinecraftEdu, an educational version of a popular sandbox game Minecraft, was selected as the game that was used as the platform for the study.

During the study, we covered the field of game-based language learning from the points of view of education, linguistics and game studies. Based on theoretical background, two interventions were designed where games were used as learning environments for authentic language use. In the first intervention students wrote blogs about their experiences, which were later analysed to provide the basis for designing the second intervention. To provide a more authentic communication environment in the second intervention, the students were playing with foreign students and communicating using a text chat. To describe what areas of language are trained while playing the game, a series of survey statements were formulated based on the competence descriptions of the Common European Framework of Reference for Languages. The students answered the survey after playing the game with the foreign students.

The first intervention revealed that the most significant hurdle for the use of games in this study was the lack of motivation to use the target language in the game. In an ideal situation, using the target language should be a necessity, not an imposed requirement. Fortunately, it was possible to remedy this by playing the game with foreign students. Another aspect that could benefit the use of games in classrooms is the balance of structured and open activities. Many building projects were built alone or in small groups. The students could possibly be encouraged to collaborate through

more structured tasks. Also, time should be allocated to learning how to play the game to alleviate frustration later on. Encouragingly, writing the blog posts was a valuable exercise itself. In the process the students had to reflect their activities and describe what they were doing. Lastly, there was a lot of excitement in the blog posts. For example, the students felt the game to be engaging and meaningful, as example six from a blog post aptly illustrates:

(6) Like I told you at my first post I have never before played Minecraft. I have died few times after I came from underground where I was mining and lost lot of iron and coal. But today I found my first diamonds! It may sound stupid but [sic] im proud I have found diamonds! Now i can do something fun with my diamonds. [student 1, post 2]

The analysis of the second intervention revealed that pragmatic competence, ability to learn and existential competence were trained the most. As the case study approached games as the environment rather than the content of learning, it was not surprising that linguistic competences were trained least, according to the students. However, it should be noted that the current study asked about learning new lexical items, rather than practising existing vocabulary. How the change of statements would affect the students' reactions remains a question for further research. What was surprising were the low scores of sociocultural competences that, in light of previous iterations and theory, were assumed to be among the obvious competences practised.

Concluding a case study is difficult; on one hand there are clear trends in the data, on the other hand the scope is relatively narrow and as discussed above, overgeneralisation should be avoided. However, as the purpose of the study was not to measure learning outcomes there is no need to be concerned with pre-post settings and how much a skill improved. Rather, the aim was to collect self-reported data of what areas of language the students practised while playing the game.

This study has provided insights to what kind of learning takes place when games are used as the authentic context for language learning. As a case study, the results themselves are not conclusive but rather provide starting points for further research. A longer-term study is required to determine whether the practise on different competences would be more evenly distributed over repeated, long-term use of the game. So, what implications are there for using collaborative multiplayer games and Minecraft in particular in language teaching? Certainly there is excitement but also some interesting glimpses to what areas of language use could be trained using this kind of games. In the context of this study, games seemed to supplement the areas of language use that some other approaches neglect. To further explore these possibilities remains a question for future research.

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Appendices

In the study, two surveys were administered online and for practical reasons the online HTML-layout was converted to a readable form for the appendices.

Appendix I - Survey form I: Language competences

This survey form was administered to the participants of the second intervention to chart what general and linguistic competences they were practising while playing games. The survey was created using the secure online service of University of Tampere (elomake3.uta.fi).

Kokemukset pelistä

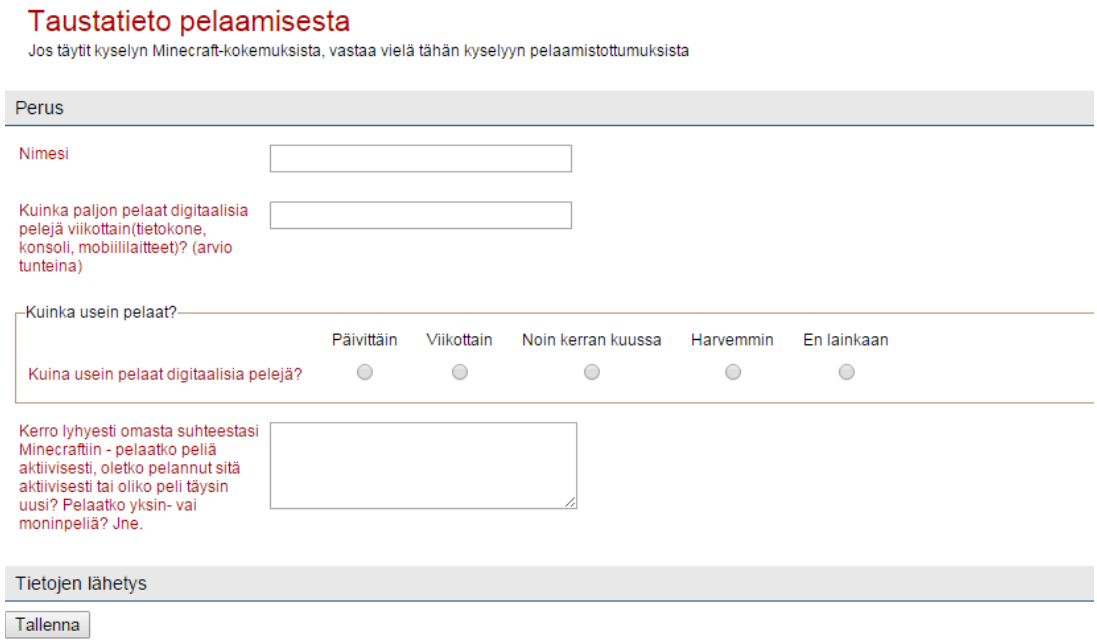
Nimi

Kokemukset pelistä

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I learned new things about a foreign culture.					
Playing with someone from another culture made me aware of my own culture.					
I learned new things about the game and its contents.					
I was able to take into account the other person's culture.					
While playing I was able to communicate using my own strengths as a speaker.					
I was able easily able to integrate new phrases and structures to my language.					
Listening to others speak was hard because I couldn't hear where one word began and the next started.					
I was able to focus on the task at hand and understand why I was doing it.					
When I had problems I knew where to find resources needed to solve the problem.					
I didn't learn any new phrases or words.					
I had to use new grammatical structures to communicate.					
I needed to pay attention to my pronunciation.					
I focused on how to spell certain words.					
I got to practise how to pronounce written forms of words.					
I had to consider how polite I was to other players.					
I learned new sayings or proverbs.					
I heard and was able to understand a dialect or accent different from mine.					
I needed to consider how to organise my ideas to produce logical messages.					
I knew what forms and structures to use to communicate my message.					

Appendix II - Survey form II: Gaming background

The second survey form asked the students about the history and habits of playing digital games and more specifically Minecraft. The survey was created using the secure online service of University of Tampere (elomake3.uta.fi).



Taustatieto pelaamisesta

Jos täytit kyselyn Minecraft-kokemuksista, vastaa vielä tähän kyselyyn pelaamistottumuksista

Perus

Nimesi

Kuinka paljon pelaat digitaalisia pelejä viikottain(tietokone, konsoli, mobiililaitteet)? (arvio tunteina)

Kuinka usein pelaat?

	Päivittäin	Viikottain	Noin kerran kuussa	Harvemmin	En lainkaan
Kuina usein pelaat digitaalisia pelejä?					

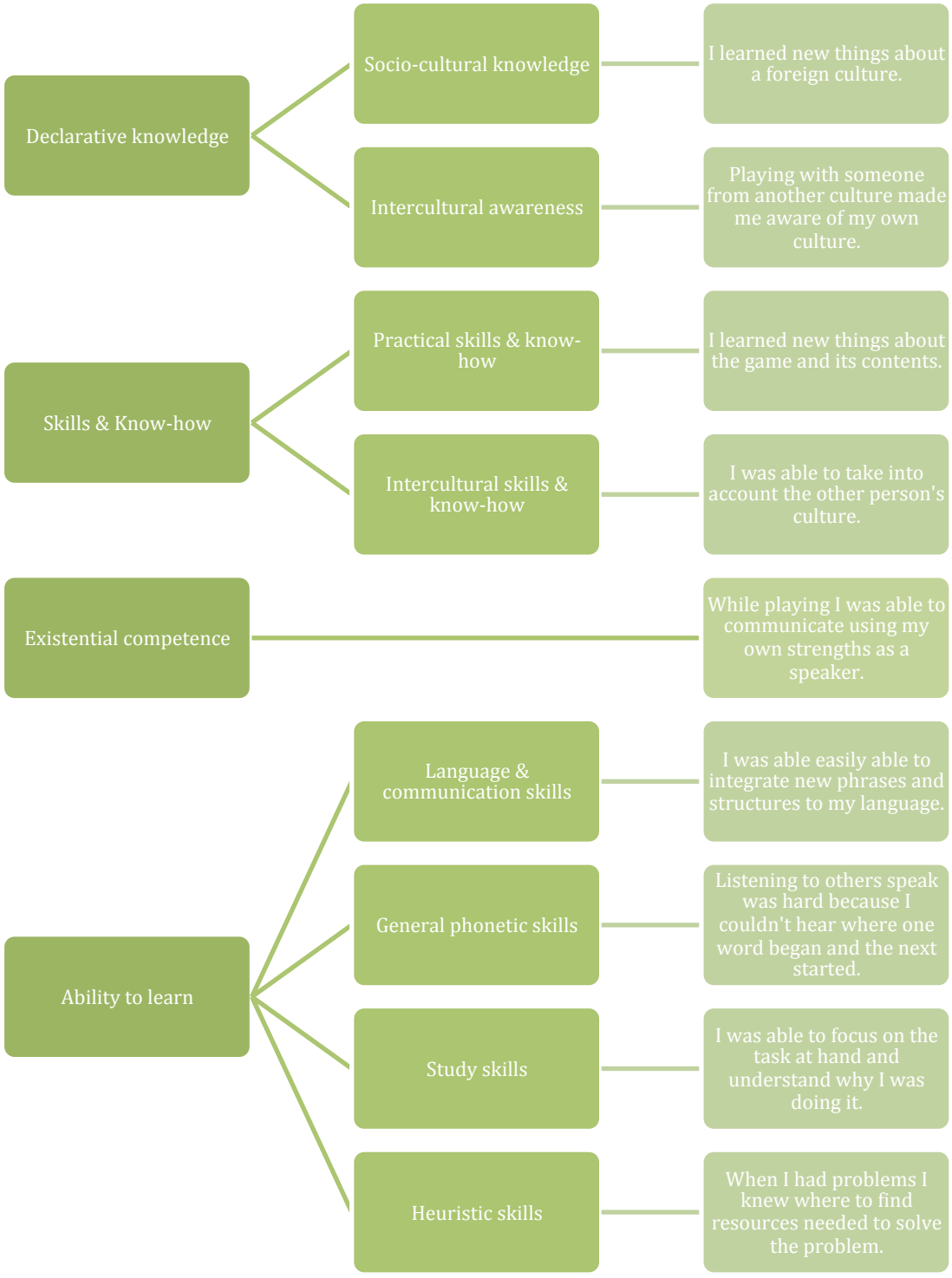
Kerro lyhyesti omasta suhteestasi Minecraftiin - pelaatko peliä aktiivisesti, oletko pelannut sitä aktiivisesti tai oliko peli täysin uusi? Pelaatko yksin- vai moninpeliä? Jne.

Tietojen lähetys

Tallenna

Appendix III - General Language competences to statements

The participants of the second intervention answered a survey on communicative language competences they practiced playing MinecraftEdu (appendix I). The survey statements were rephrased based on the descriptions of the CEF (described in 3.3.3). The chart below shows the statements and the corresponding competences.



Appendix IV - Communicative Language competences to statements

The participants of the second intervention answered a survey on communicative language competences they practiced playing MinecraftEdu (appendix I). The survey statements were rephrased based on the descriptions of the CEF (described in 3.3.3). The chart below shows the statements and the corresponding competences.