



Development of learning environments from a student learning perspective

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2018 Laurea



Laurea University of Applied Sciences

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a student learning perspective**

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Hospitality Management
Bachelor's Thesis
November, 2018

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Year	2018	Pages	53
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The subject of this thesis project is the development of learning environments from a higher education perspective. The learning environments consist of social, physical and virtual environments. This thesis was done for Breda University of Applied Sciences, later referred as BUAS, located in the Netherlands. BUAS is a higher education institute that is currently busy with merging its four different campuses, including five different academies into one new campus. The aim of the thesis was to collect information on how the learning environments would better support the learning.

The theoretical framework used in this thesis consists of learning concepts, learning environments and 21st century skills (P21 2016). From learning concepts and learning environments the theory is based on their evolution, future predictions and their relation to each other. The 21st century skills are being used to reflect the future skills students need in the changing working life. In this thesis the focus is on how the learning environments could support the development of these skills.

The data was collected using three methods: benchmarking, interviewing and observation. Benchmarking was carried out on two different higher education institutes and the aim was to collect ideas concerning functional concepts and environments. The interviews were done as contextual interviews, and they were conducted on the premises of the institutes where the interviewees study. The aim was to gain insight into the learning experiences of the students and the effect that the learning environments have on those experiences. Observation was used as a supplementary method, by observing the atmosphere and the actions of the students during the benchmarking and interviews. The results were analysed using categorization and dividing the themes that were found from the results.

According to the results, the social environment was found to be important when it comes to the constructive learning concept and interactive learning. Virtual environment was seen increasing its importance through virtual platforms used in assignments and group work. From the physical environment, flexibility, accessibility and the efficient use of the spaces were found to be the most supportive aspects in student learning, according to the interviewed students.

The findings indicate that the individual needs of the environments need to be considered to increase the learning motivation of the students. Individual needs would also be a functional topic for further research to do internally for the students of BUAS.

Keywords: Learning environments, development, learning experiences, higher education

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Oppimisympäristöjen kehittäminen oppimisen näkökulmasta

Vuosi 2018 Sivumäärä 53

Tämän opinnäytetyön aiheena on oppimisympäristöjen kehittäminen korkeakoulujen näkökulmasta. Oppimisympäristöt koostuvat sosiaalisista, fyysisistä ja virtuaalisista ympäristöistä. Tämän opinnäytetyön toimeksiantajana on Breda ammattikorkeakoulu, myöhemmin BUAS, joka sijaitsee Hollannissa. BUAS on ammattikorkeakoulu joka käy läpi muutosta yhdistäen neljä kampusta ja viisi opinto-ohjelmaa yhdelle, uudelle kampukselle. Tämän opinnäytetyön tavoitteena on selvittää, miten oppimisympäristöt voisivat paremmin tukea oppimista.

Tietopohja muodostuu oppimiskäsityksistä, oppimisympäristöistä sekä tulevaisuuden taidoista. Tietopohja oppimiskäsityksistä ja oppimisympäristöistä perustuu niiden kehitykseen ja tulevaisuuden kartoitukseen sekä niiden suhteesta toisiinsa. Tulevaisuuden taidot on tuotu opinnäytetyöhön kuvaamaan niitä taitoja, joita opiskelijat tarvitsevat muuttuvassa työelämässä. Tulevaisuuden taitoja on tarkasteltu oppimisympäristöjen vaikutuksen kautta.

Tutkimusaineiston keräämiseen käytettiin kolmea eri menetelmää. Nämä olivat benchmarking, haastattelu sekä havainnointi. Benchmarking suoritettiin kahdessa eri korkeakoulussa keräten ideoita toimivista konsepteista ja ympäristöistä. Haastattelut tehtiin kontekstuaalisina haastatteluina niiden korkeakoulujen tiloissa joissa haastateltavat opiskelevat. Ideana oli saada tietoa oppimiskokemuksista ja oppimisympäristöjen vaikutuksesta niihin. Havainnointia käytettiin aiemmin mainittujen menetelmien tukena havainnoimalla ilmapiiriä ja opiskelijoiden käytöstä benchmarkingin sekä haastattelujen aikana. Tulokset analysoitiin kategorisoidulla ja jakamalla teemat, jotka tulivat tuloksissa esiin, eri kategorioihin.

Tulokset, pohdinta sekä johtopäätökset osoittavat eri näkökulmia jotka tulee ottaa huomioon oppimisympäristöjen kehittämisessä. Sosiaalinen ympäristö nousi tärkeäksi konstruktiivisen oppimiskäsityksen ja interaktiivisen oppimisen kannalta. Virtuaalisen ympäristön tärkeys on kasvussa virtuaalisten alustojen kautta, joita käytetään tehtävänannoissa sekä ryhmätöissä. Fyysisestä ympäristöstä joustavuus, saatavuus sekä tilojen tehokas käyttö nousivat eniten opiskelijakeskeistä oppimista tukeviksi näkökulmiksi.

Kehittäessä oppimisympäristöjä, yksilölliset tarpeet ympäristöille tulee ottaa huomioon kasvattaakseen opiskelijoiden motivaatiota oppimisessa. Yksilöllisten tarpeiden tutkiminen olisi myös toimiva aihe jatkotutkimukselle, joka voitaisiin toteuttaa sisäisesti Breda ammattikorkeakoulun opiskelijoille.

Asiasanat: Oppimisympäristö, kehitys, oppimiskokemus, korkeakoulu

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1 Introduction

Learning concepts have changed through the years in relation to the other changes in the world, like working life. From industrial time and routines, the digitalization has brought us into the globalized world of interactions and constructive learning. Just like the different concepts, the learning environments have changed over time and a relation can be seen between the evolution of the environments and the concepts. For example, classrooms, group work spaces and living laboratories are all meant to serve their own purpose and to develop a different set of skills. But it is important to research how the learning environments would better support the learning including the learning concepts, needed skills and learning experiences.

The 21st century skills (P21 2016), which will be explained more specifically in chapter 5, consist the framework used in this thesis to explain the future skills that are important for the students to learn. The framework of these skills is one of the aspects that need to be considered in developing the learning environments. The learning environments include social, virtual and physical environments that all have influence on the learning experiences and the efficiency of learning. These aspects are all equally important to consider in the development of the learning environments as well.

In this thesis, I took a look into the variety of learning concepts and learning environments to see how those have changed over time and what kind of change is expected in the future. I also went deeper into the learning concepts and environments by benchmarking my own higher education institute Laurea University of Applied Sciences, and the University of Helsinki, in Finland. The approach for this thesis is done from the higher education point of view, and I also used interviewing as a method by interviewing the students from different higher education institutes to find out the influence of the learning environments on the learning experiences of students. In both benchmarking, and interviews, observation was used as a supplementary research method.

1.1 Background of the thesis

The idea for the research and theme of learning environments and learning concepts came from an EuroFM Summerschool course which I attended in Breda University of Applied Sciences (BUAS), in the Netherlands from 27 August to 7 September 2018. The idea behind the two-week intensive course was to think about the educational needs the students will have in the future in order to act in a proactive manner towards the development of these learning environments. In this course there were students from different universities, and the course was part of the facility management program in the newly renovated campus of BUAS. Students who attended this Summerschool came from different learning environments in the Netherlands, Finland and Austria.

The theme of the course was developed around the concepts of Imagineering and design thinking. Imagineering is a word that comes from imagination and engineering. It practically means implementing creative ideas into a practical form. Design thinking is a strategy making process that focuses on the human behavior. It is based on defining the needs of the target group and then prototyping and testing the ideas. (Brown 2008.) In groups of three, we used the golden circle model (Sinek 2009) to figure out why, how and what would be needed in the future to develop the learning environments to the right direction. In the ideation we used multiple design thinking tools, like personas and customer journeys. The themes that popped out on the assignment, have been dived deeper into in this thesis as well.

The most common themes that came out during the course, were globalization, collaboration, technology and need of multitasking and expanding knowledge outside of one field. With a group of different lecturers, we got a good insight of current problems at the new campus from different points of views and an insight to the current situation of the learning environments in BUAS, including the changes they have already made. It gave a good picture of ideas that students have for the future improvement, and for me it gave an idea to take it further by making my thesis about the subject.

1.2 Purpose of the thesis

In the figure below, the aim of the thesis is presented with the research questions that are chosen to support and attain the aim. There are multiple factors that influence our learning experiences in a higher education institute, for example the main subjects used in the literature review of this thesis: learning concepts, learning environments and 21st century learning skills (P21 2016). I have focused on these objects by researching the evolution of the learning concepts and learning environments and the meaning that the learning environments have in supporting the learning concepts and the development of 21st century skills (P21 2016) which were chosen as an important aspect in the learning of students.

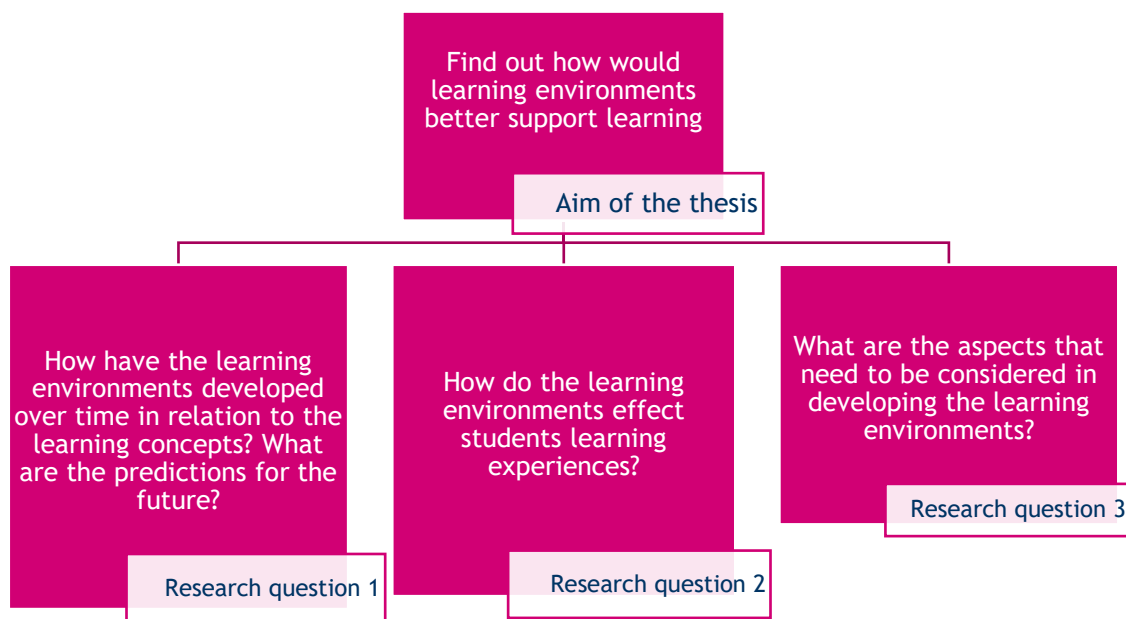


Figure 1: Aim of the thesis and research questions

It is not directly measurable how learning environments effect the students learning, so I have focused on the experiences of the students. With theme interviews and observation, it was possible to get an insight into how students experience the different spaces and how these environments support and facilitate their needs, considering all social, virtual and physical environments. The higher education institutes also want to provide more and more personalized study plans for the students, which leads to different needs of the environments. Students are also all individuals, with their own different needs, and in this thesis, it was taken into consideration by interviewing and observing different kind of students from different education fields and institutes to get a wider perspective.

Collaborative design, which means taking all the stakeholders and users to be part of the development process, has been acknowledged as an important aspect in designing learning environments (Mäkelä, Lundström & Mikkonen 2015). By predicting and mapping out the changes of the environments we can make them more functional, but it takes every stakeholders input. Collaborative design is more closely explained in chapter 4 from the environment development point of view. The purpose of this thesis is to provide the Breda University of Applied Sciences an insight of the development ideas gathered from the students learning point of view as a specific group of stakeholders. The research is made by finding out how the learning environments would better support the learning.

When studying becomes more student-centered, the student experience takes an important role and the influence of the environments need to be researched through those experiences. With the knowledge of the evolution and different predictions for the future we can predict

the changes in learning concepts and needed skills which helps us in developing the environments to be more future proof and functional. By analyzing the data collected for this thesis, the aim is to lead us to conclusions on how the learning concepts and learning environments have and will change in relation to one another, how the learning environments effect on the learning experiences and what are the aspects that need to be considered in developing the learning environments.

2 Breda University of Applied Sciences

As mentioned before, this thesis is written for Breda University of Applied Sciences, BUAS, to help them improve the learning environments. BUAS is located in the city of Breda, in the Netherlands. There are around 800 staff members working at BUAS and 7000 students from over 100 countries studying in this international higher education institute. BUAS offers different programs in the fields of games, media, hotel, facility, logistics, built environment, tourism, leisure and events. (BUAS n.d.). Altogether these fields form five different academies that are now in construction to be brought from four different locations into one big campus.

What comes to the environment change within this new campus, it will create more interaction between the different academies. Compared to the earlier situation with four different campuses, the decision to have only one library, one service desk and one meeting square, increases the inevitable interactions and make the offered services more efficient. Even though the interaction and efficiency are the intentions of the BUAS reformation, they need to create a new way to meet individual needs, when there is for example, only one library serving thousands of students (van Os & van Leeuwen 2018).

Overall the new campus should be ready by September 2019, but this is only the physical environment. One of the reasons behind this thesis is to think about what actions could be done to make the learning environments more future-proof and support better the learning. This has been already considered in the construction of the physical environment by making the spaces flexible and updating the equipment to improve sustainability. The need of constant development is still there, also after finishing the physical construction part of the environment.

The vision broad outlines of BUAS are created in different categories. Concerning this thesis, the most important ones are the key qualifications as an objective, the strategic themes as the content and the vision of the learning environment. The key qualifications that make up the profile of BUAS graduates are self-managing, expertise, creative and innovative that are also linked to the 21st century skills (P21 2016). The strategic themes are entrepreneurship, Imagineering, cross-cultural understanding and social responsibility. The vision of learning environment of BUAS is to be motivating and challenging. The learning environment is a mix of inspiring teaching methods, technology and e-learning as well as interaction and time and

place independent learning. The vision of the learning environment plays a vital role in relation to the vision of the student which is based on motivation and ambition by challenging own talents, making own choices and gaining international experiences. This is also supported by the vision of the staff, offering supervision and feedback, and facilitating the learning process. (Koens 2018.)

The mission of BUAS in a nutshell is to inspire the students and staff to develop and use their talents to their full potential and be meaningful to the global society. BUAS wants to prepare the students to become global citizens. With an open mind and commitment to continuous growth and development they will become responsible professionals. BUAS accomplishes this by maintaining close relations with the working life, social institutions and the quality of staff members. In their specific disciplines they are aiming to be a front-runner in developing and supplying knowledge. (Breda University of Applied Sciences 2017.) Considering this thesis, it is also important to know, that BUAS does not want to grow in the number of students, like most of the higher education institutions. The future strategy of BUAS is actually to decrease the overall number of students and to concentrate more on the quality of teaching and learning (van Os & van Leeuwen 2018).

The vision of BUAS is to be an internationally recognized leading institute by 2030 with a strong industry and society-oriented outlook. The vision to get there, is to keep the knowledge updated through different research projects for and with industry clients and through cooperation with international knowledge institutes. Companies are not just clients but also partners in delivering and developing education in terms of lifelong learning. This helps also in the vision of creating professional value in a professional environment. The key words to first phase of strategy 2018-2021 are accelerate and connect. The other two phases are international expert performance and the recognition. (Breda University of Applied Sciences 2017.)

3 Learning concept change

Learning concepts have changed over time and they keep on changing along with the changes of the world, human behavior and the working life. The relation with the learning concepts and the world situation can be seen in the skills that are taught and the methods used in teaching and studying. Also, the subjects have changed a lot over time which has automatically influenced the teaching methods and concepts of learning as well. Right now, we are living in the period of change in working life, especially when it comes to digitalization. There have been big upcoming phenomena in just a last few years, for example start ups, cloud computing and as the most recent, artificial intelligence (Lakkala 2018, 24-26). All these big changes and phenomena needs to be considered while thinking about the turning point, where the critical changes happen in working life and learning.

It is important to know the evolution of the learning concepts, but we also need to consider the changes in the future. What are the upcoming changes in the working life, what professions will disappear and become useless, what are the important skills we will need and what are the best ways of learning these skills. With different examples we can see the relation with the changing time and the ways of learning. The learning nowadays has already widened outside of the school walls, transferred from the books to the internet and become more interactive, but we need to start to think about the factors that will affect the current situation next.

All around the world the development and the relation between the concepts of learning and the time can be seen. These changes have been necessary and unavoidable throughout the time and they will change continuously and even more rapidly in the future. There is a necessity for the education to be on the same page with its time, or preferably predict it, to make sure that the graduating students have the best possible skills and knowledge when they enter the working life.

3.1 The evolution of learning concepts

As an example of a relation between the learning and the time and the situation of the society can be seen by looking at the history of University of Helsinki. When it was first founded in 1640 with the name of Royal academy of Turku, the topics that were taught were about the structure of the universe, the nature of matter, mechanics and the resources of the earth. During that time, the teaching and the research was connected to the religion, Lutheran theology, and European humanism. From 1809, when Finland became a part of Russia, the university started to use scientific methods to educate edification and science, and when Finland got its independence 1917 the members of the University community started to promote the international interaction and economic development. (University of Helsinki 2018.)

On the 1900s the industrial work was the most common and popular work which expected the education to be about learning to follow the routines and preparing for the tasks needed in industrial work. However, when the society developed more into problem solving and thinking, the learning concept turned into more cognitive learning styles. When we go further in the globalization, the constructive learning concept has taken its place based on the social learning and interactions. Considering the constructive learning concept, learning is not only collecting and providing information anymore, it has become also experience-based and social. Digitalization has played a vital role in the changes of learning concepts making the society to question some of the old concepts and to create new ones. (Airo & Flemming 2017, 41-43.)

When we take a look into the history of the last 30 years, which does not sound like a long time, a lot has changed when it comes to the variety of different kind of students and their

behavior. That is why there is a need to take a closer look into the understanding of learner concept, stances and experiences, but also expectations and assumptions that might occur about students. There has been a tendency in higher education to consider the students to have the same needs, wants and approaches to learning. This has often been called the one-size-fits all approach. The problems nowadays are in assumptions like this, giving out the same reading and questions expecting the students to know how to think, read and write in a specific way, or an assumption that an essay feedback which refers to argument or structure could be transparent or self-explanatory. (Savin-Baden 2008, 11.)

3.2 Current situation of learning concept

Currently the mostly used learning concept is constructive which means building the knowledge rather than just transferring it. When students build knowledge by themselves, their earlier experiences and concepts influence on how they observe and construe information. This also means that the learning comes from the students themselves and shows that the knowledge can be handled and construed in different ways. (Jyväskylän ammattikorkeakoulu 2018.) Even though the social interactions play a vital role in constructive learning, the digitalization has brought us the method that can be called blended learning (Bonk & Graham 2006). This means that we use both, physical and virtual learning, doing some of the work in school, in actual classes, and some of the work in a virtual platform using a lot of internet and writing with a computer. The definition of blended learning comes from blending the virtual and face-to-face learning in education. The expansion of technologies has made it possible to distribute learning environments. Face-to-face interaction has earlier been more separate from the virtual learning environment, and the face-to-face tended to place the priority on the human to human interaction while the distributed learning focused on the learner-material interaction. With the fidelity of current communication technologies, we can now have face-to-face interaction through distributed environments as well. (Bonk & Graham 2006.)

As an example of blended learning environment, I will use an intensive course of service design organized by Laurea University of Applied Sciences. While the course lasts a whole semester, there is only one week of intensive learning in the classroom. The course was based on a project done in groups, and the intensive week at school created the possibility to improve the team spirit by getting to know the persons in the group face-to-face. The rest of the semester was not time or place bound and gave the students the possibility to work where and whenever they wanted to. When the learning becomes less time and location related, the social environment becomes more important. This also develops the students' self-management and ability to be more responsible. (Airo & Flemming 2017, 41-49.)

One of the examples of blended learning is the flipped classroom. With the use of virtual environments, the students can watch the lectures at home, so that the class time can be used

for applying the knowledge by active learning practices like discussion or group work (Steelcase n.d. B). This creates a better supported environment on the problem set part by helping on the factors that a student might get stuck at home, while at school they can get feedback and support from the teachers and other students. This also leads to more collaborative and interactive learning. (Tucker 2012, 82-83.) Unfortunately, the flipped classroom does not take away the possible problems when it comes to students' engagement to the learning. They can skip the lecture at home, but they can also be not focusing in class, for example by playing with their phone. In this flipped classroom model, the pro is that at least they will do the problem solving, where most of the actual learning happens. This also helps the students to find out what they were missing, if they have been absent from a class, or if they have been present but want to review the material (Tucker 2012, 82-83). For the teaching point of view, the flipped classroom frees class time to work more individually with each student and make the learning more student-centered. It also gives a better knowledge on the different paces that different students are learning.

To make the learning more student-centered, the students need to have a possibility to learn in their own pace which allows transferring the responsibility of learning from the teacher to the student. This is possible for example when it comes to open-ended creative projects, without a one specific right solution, in which students are encouraged to be more open-minded. This is also why student-centered learning is often referred as project-based learning (Zmuda, Ullman & Curtis 2015). The idea is to use technology and the students' own abilities to achieve higher standards than the more traditional learning concepts. From the teaching point of view this means getting into more personal level and creating a relationship with the student.

3.3 Predictions for the future

When we think of the history and the current situation, we think of the possible changes that could take place in the future. For example, if the students would be learning in their own pace, it could be possible, that there is no necessity to separate the students by age into different groups anymore. There would also be a possibility to blend the different subjects to show the students the connection between them. (Khan n.d.) With the flipped classroom model, students are more able to find a way to learn on their own and to learn the way of structured self-teaching (Talbert n.d.).

One thing, that has been predicted for the future by Salman Khan (n.d.), the founder of Khan Academy, is to completely change the education from passive learning, where students traditionally sit in a lecture taking notes, to more active learning. This is also called the creative model since it changes the role of a student from learning what someone else has discovered to creating their own innovations. It doesn't mean that the traditional learning, lectures for

example, would disappear, but it would turn to be that type of learning which students can do in their own time and at their own pace.

While the technology goes forward, the more traditional jobs including physical labor are also getting more and more automatized. This frees more people into the creative and innovative sector. When we look at the predictions for 2060, there can be seen a possibility that most of the physical labor jobs are gone, which would mean that most people would be doing the creative work. (Khan n.d.) The future education will overall focus more on the skills and experiences that go further than just the content coverage. The teachers are no longer the knowledge keepers since the access to information will be available for everyone 24/7. (Talbert n.d.)

When shifting to a system where the students are allowed to learn at their own pace, the learning becomes also more achievement based. There are different kind of achievements in the core of education, but it should be up to the student to decide how they will learn them. When it comes to the achievements, it is not just the grade point average and the traditional ways the students are asked to prove their knowledge when they enter the working life. When we move on to more creative jobs, the employers will want the graduates to have concrete achievements on what they have built or created. (Khan n.d.)

Also, the concept of a teacher is predicted to change and become more of a coach or a mentor for the students. Since the concept of a classroom is changing, the students are learning in their own pace and the role of the teacher is more like a mentor. This can be emphasized with a decentralized classroom where the teacher is among the students (Steelcase n.d. A). It also gives the institute a possibility to remove the classroom walls. The point here is that for example the students from three different classrooms could be in the same space and get the mentoring or coaching from three different teachers. (Khan n.d.) This type of model would create more interaction between the teachers and the students.

4 Learning environments

Learning environments are the spaces where the learning happens. These consist of social, virtual and physical spaces. Already in the school premises there are multiple types of physical spaces like classrooms, group work spaces, and for example living laboratories that are seen as an emerging way to produce knowledge and to do research (Pulkkinen & Staffans 2015, 141). But even the physical environments of learning are no longer just the spaces inside the school walls but also other physical environments that can be used for learning such as libraries, co-working spaces and homes. While the learning concept is transferring into the constructive concept, needs for the learning environments are changing as well, and it is important that the environments accomplish to support the concept and the learning itself. Since the traditional classroom alone does not meet the demands of the learning concept and

learning methods anymore, the attention must be paid also to the social and virtual aspects (Salmisto 2015, 246).

Virtual spaces nowadays are seen to have as important role as physical spaces. The difficulty in the perception of virtual space is that they are often seen dislocated from the physical space, but they are not. Andrew Kim from Steelcase WorkSpace Futures has said that “What’s interesting is that as learning is becoming more virtual, the virtual activities are actually becoming more physical. One might say virtual and physical are meeting in the middle” (Steelcase n.d. B). The problem that some people see, is that virtual spaces might feel less organized than face to face learning, which leads to the need of reconstruction of the virtual space. (Savin-Baden 2008, 81.) When a course takes a place only in virtual form, as a virtual course, it gives the teacher less control towards the students and often leads to less motivated students since it is seen less mandatory to be present and meeting the deadlines. As an example, statistics of a virtual course about real estate management organized by Laurea, are presented. On this course 150 students signed up for the course. Around 50 students showed up in the first meeting and only 20 students executed the course on time. This means that around 90 percent of the students who signed up for this course, either quit it or pushed the deadlines further from the original timetable to the following semesters. (Airo & Fleming 2017, 47.)

The development of the learning environments to meet the users` needs is more crucial than ever. Even though the learning has expanded outside of the school walls, the facilities and buildings remain the most important places for learning and creating knowledge. In investments and renovations, the users` ways of using the premises need to be considered and the user perspective needs to be kept in the center of the design. Also, the development of the technology sets its own requirements for the learning environments in both collaborative and personal learning activities. To make the students learn and challenge themselves but also to enjoy the learning and going to the institution, both formal and informal environments need to be designed. Informal and social spaces are important when developing a higher education campus and they can include possibilities for organizing activities outside of the curriculum and allocated spaces. Informal spaces are also the ones that are not usually related to one academy or department, allowing us to seek for solutions that would benefit most of the students. (Poutanen 2015, 250.)

4.1 Learning spaces from history to future

Most of the physical environments and spaces have changed over the history as the needs of people have changed as well. This can be seen in architecture in both outside and inside spaces. When it comes to the education environments, those have changed in relation to the concept changes mentioned above. The changes in the needs of the people and the effect on the environments can also be seen in the everyday life. If we think for example homes, the

needs have changed from having big halls and maid rooms to including open concept kitchens and other practical solutions. The behavior of the people need to be considered in design to create smart and suitable spaces. (Airo 2018.) The role of the learning spaces will evolve along with pedagogy and technology. The spaces need to support collaboration and personalized learning that come from the constructive learning concept. Since there will be as many ways to interact as there are students and ideas, the spaces need to be designed to be flexible and adaptable. (Talbert n.d.)

By looking at the diversity of different kind of students, it shows that there is a need for very different kind of learning spaces. Instead of recommending a specific space for a specific assignment, the students should be encouraged to find what suites them personally. For example, suitable writing space usually has a relation to one's own lifestyle and for some students this could mean a quiet space with no distractions and for another student this could mean a noisy café - whatever suites the individual the best. It needs to be considered that it is not just the importance of the physical space, but also the psychological circumstances. For example, some people need to clean the space to keep focused on the writing and some might need to get away from home, to a library, or even to a vacation in a warm country to write more efficiently or creatively. (Savin-Baden 2008, 47.)

Living laboratories, that were mentioned briefly earlier, are emerging as a learning environment. They can also be seen as a mechanism to interact with and to serve the society. Living laboratories can collect different stakeholders to work together and that way create new communities of interest around emerging developments. They can also work as functional places for students from different academies and enable them to work together on a trending matter. (Pulkkinen & Staffans 2015, 143.) The restaurant for the staff and students in Laurea is a good example of a living lab. All the cooking and serving of the food is done by the students from the hospitality management program. The restaurant is open at lunch time for everyone, and this way serving the whole area and society around it. It is also, like living labs mostly are, focused on sustainability through using raw materials and the energy efficient ways of working.

4.2 Uses of the environments

In the learning environments, also attitudes have changed the needs for the spaces. For example, the hierarchy between teachers and students is a lot lower than it used to be. It used to be the normal situation, where teacher is teaching in the front of a long classroom full of students listening, and not questioning the topics that were being taught. Over time, learning environments have become more interactive and students can question the topics and methods as well. (Koens 2018.) This can be called dialogic learning, where students and staff can relate their own experiences to the topics to explain them more clearly and practically to ex-

plore further issues. Therefore, it creates an environment where critical thinking is encouraged and helps challenging the structures and boundaries within higher education, both in virtual and face to face situations. (Savin-Baden 2008, 54.) This has also changed the categorization and control of the spaces in terms of the users of the spaces. It has become necessary to create more neutralized spaces for teachers and students to meet and discuss in. The interaction between the students has also increased which leads to the need of spaces for them to meet each other as well.

Research has shown that the students learn more efficiently when they are learning in groups, instead of doing all the research individually. When they need to explain the collected information to others, they need to assimilate the information and make it clearer, which also gives the opportunity to connect the earlier knowledge into the topic and make the conceptual understanding stronger. Communal learning is about developing the social skills and creating the identity of a person related to the society. These types of skills cannot be learned alone or from the books. (Lakkala 2018.) In the constructive learning concept which is mostly being used nowadays, the social part of the learning has an important role, which also increases the need of functional spaces for interaction.

When we want to develop the spaces to better serve the users, all the users should be involved in the planning and developing. It is time consuming and complicated process, but it has been discovered that the traditional way of top-down planning is not as successful. All the stakeholders should be involved in the planning and problem solving as early on as possible through collaborative creation and design. Participatory co-design of the learning spaces can have a positive impact on learning. To increase the learning-centeredness the largest user group, students, need to be involved. (Tähtinen 2015, 170-179.) This does not mean forgetting the other important stakeholders, like teachers, staff and researchers, but in this thesis the research methods are chosen and used to get results from the student perspective.

Creating the living laboratories and other functional spaces for interactive learning and working, the spaces need to become places for the users. When the users experience a space as a place, they want to use it for gathering together. It becomes their own place to interact and collaboratively improve their knowledge and create new practices and innovations. The space should be flexible for different uses and include the latest technology available for the students to use. The meaning of these type of places is to increase the motivation and help all students from all academies to enjoy learning and create new knowledge and skills throughout their studies. (Lonka, Vaara & Sandström 2015, 223.)

5 Learning environments supporting the 21st century skills

21st century skills are the skills of the current time and future, needed in the working life, that should be developed through education. Therefore, these skills are chosen here to present the important aspect of future skills that need to be considered in developing the learning environments. There are a lot of frameworks done from the 21st century skills, but in this thesis, the framework used, is the one developed by the Partnership of 21st century skills (2016). These skills are divided into three main categories shown in the table 1 below. The learning and innovation skills are the ones to separate the students who are ready for the complexity of life and working environments and who are not. Information, media and technology skills are strictly working side by side with the rapid changes in technology and create the ability to make individual decisions and collaborate in the unpredictable environment. To be an efficient citizen and employee, students must learn into functional and critical thinking. The last category is life and career skills, which develop students thinking skills, knowledge and social and emotional competencies. The main skills under each category are shown in the Table 1 below. (P21 2016.) In developing these skills, also teaching methods should encourage the students to take the responsibility of their own learning.

<u>Learning and innovation skills</u>	<u>Information, media and technology skills</u>	<u>Career and life skills</u>
Creativity and innovation	Information literacy	Flexibility and adaptability
Critical thinking and problem solving	Media literacy	Initiative and self-direction
Communication	Information and communication technologies (ICT) literacy	Social and cross-cultural interaction
Collaboration		Productivity and accountability
		Leadership and responsibility

Table 1: 21st century skills categories (P21 2016)

The constant change of the society and the working life challenges us to update our knowledge and skills all the time. The people who will succeed in the future will need a good resistance of change as well as abilities of self-knowledge, empathy and interaction. It is

about holistic approach that combines the persons characteristic, knowledge, skills and the motivation for developing himself. To make it possible for the student to reach these competences, the education needs to help on finding students strengths and motivate them to find their ambitions and to reach their full potential. (Urpalainen 2015.)

In the subchapters I have taken a deeper look into each of the three main categories to see how the learning environments would better support the development of these skills and how the virtual, social and physical environments are related to them. In this chapter, it is important to keep in mind that the physical learning environments do not only consist of the classroom spaces. Hallways, corridors and even school yards can be nowadays seen as potential learning spaces when we redesign the educational spaces for different purposes. (Mäkelä, Lundström & Mikkonen 2015, 199.) When the students are encouraged to use different spaces that best suit their needs also outside of classroom, the entire campus becomes an immersive learning experience. With flexible furniture and variety of technological devices the students need to make choices to explore an ecosystem of spaces that fosters learning beyond the formal environment. (Steelcase n.d. A.)

5.1 Learning and innovation skills

When it comes to creativity and innovation, the environments also need to be creative and innovative in order to develop these skills of the students. When we think about project-based learning, creativity is often one of the criteria and gets support from critical thinking and problem solving. When projects are done in groups, the work becomes collaborative and improves the communication skills through interactions. To create learning environments that support the development of learning and innovation skills, we need to think about their functionality for interaction. The spaces should also offer a possibility to engage other stakeholders from the project into the collaborative work. Not just the physical and social space, but also the virtual platforms for the groups to use and communicate with are important.

The classrooms that support collaborative learning and interaction are not built as a traditional classroom, where a student walks in thinking that the teacher will do all the work. The classroom needs to be flexible and the furniture need to be able to move around for forming groups to interact with. There should also be more than just one front where all the chairs are facing. For example, on one side of the room can be a digital front with the projector, and on another side of the room can be a wall where to write. (Steelcase, 2018.) It creates a more creative and innovative mindset when the furniture and the classroom setup allow the students to turn and change the focus.

To prepare the students for working life, it is important that the students learn to take collective responsibility of shared goals through collaborative effort and evaluating the results. It can be seen, that the students take individual and collective responsibility easier when they

take part on a project that is meaningful for them. This way the learning also becomes more than just studying for the credits. Through the possibility of students getting to choose the target of the project, they are using technology more widely, interacting more intensively with the community and may even bring some changes to the real world. Collaborative work is not only challenging intellectually but also emotionally and motivationally, which leads to the fact that student engagement is crucial also when looking at it from the aspect of group dynamics. (Lonka et al. 2015, 219.)

When we seek for the student engagement in collaborative work, we need to design spaces that students want to use for learning in their free time. The challenge is often on linking the formal and informal learning environments. In the informal environments, there should be something to flourish the passion of the learners. Combining the formal and informal spaces creates also a possibility to balance the hectic and stressful environment. The informal space for free time learning could include elements from the students typical non-formal learning environments, like cafes or homes. (Lonka et al. 2015, 221.)

5.2 Information, media and technology skills

As mentioned earlier, the constructive learning concept is taking its place in the current education. Highlighting the social learning and the socio-digitality, the learning environment and activities are mediated by technological tools and applications. Socio-digital technologies and social media are also related to the forms of collaboration (Lonka et al. 2015, 218). This can also be called blended learning, which has been mentioned before as an emerging learning method. The increasing use of technology does not mean that face-to-face interaction is disappearing. The elements of information, media and technology skills, ICT, are tools used to support the live interaction and learning.

When it comes to social media, whether we use it or not, it is continuously changing the environment and ways of communication around us in the society. This type of societal and cultural changes, are automatically reflected also in the education. Currently, in the higher education, we are moving towards the time, when the “digital natives” enter the higher education institutes. There are still differences between these young students and their use of digital technology that needs to be acknowledged. When people are grown into the digital world, it can be assumed that they are not comfortable with taking the passive role of listening and receiving information. This means the increasing importance of engaging and including experiential and creative learning methods with lots of technology, such as social media and gamification. (Lonka et al. 2015, 219.)

When it comes to the learning environments, there is an increasing amount of digital equipment added and invested in. The accessibility and availability of the equipment plays a vital role when learning the ICT skills. Often in higher education institutes, there are specific

courses available in ICT skills and literacy. The equipment and platforms used in those courses should be available for the students to use also outside of the class time, and a support service for digital problems should be available as well. At current time, people use digital technologies every day at home, at work, and in third spaces, both virtual and physical. (Meyers, Erickson & Small 2013.) The need from the spaces comes mostly from the accessibility of internet and needed equipment, and the help the students may need in a case they face problems.

5.3 Career and life skills

The importance of the skills like flexibility, adaptability and social and cross-cultural interaction comes from the fact that we are rarely working in a company without other people. The social environment is important in getting along with the people and being able to work with all kind of individuals. These skills are well supported in constructive learning concept by valuing high the interactive learning and adding a lot of group work into the studies.

To help the development of cross-cultural interaction skills, adaptability and overall social skills, we need to create an international environment. To help the globalization and adapting into it, it is crucial to have a lot of interaction. In spaces, the signs should be in an international language, as well as all other information that is important. People from different classes and from different countries should be mixed with each other to increase the cross-cultural interaction that helps in developing these skills. Also, different opportunities like being an exchange student, are valuable experiences for students to develop their career and life skills through learning responsibility and self-direction.

Overall, applying to the development of all the categories of 21st century skills, flexible and multi-use spaces for learning have the best potential. The engaging learning is an active process that includes different activities that are supported by different tools and environments. The needs from the environments are not just the support to specific activity but also to foster the transition from one activity to another. This creates the need for variety of spaces that can support individual and group work, and both silent and interactive activities. This means that flexible spaces create the support for the whole engaging learning process without interrupting the process. (Lonka et al. 2015, 217.)

6 Methods

The methods used in this thesis were benchmarking, interviewing and observation. By using more than one method, the aim was to widen the perspective of the research and to increase the reliability of the research. These chosen methods are all flexible and they fit the problem solving based research of student experiences and functional learning environment solutions. A benefit of using multiple research methods is also in the reduction of inappropriate certainty, which can happen if there is only one research method and clear results are seen as

the “right” ones without any comparing to other results from other methods. (Hirsjärvi & Hurme 2006, 39.)

With a variety of methods, there was a possibility to get different kind of results and point of views from the same topic. The variety of results gave me the opportunity to compare them and analyze them from a wider perspective. These methods also worked as a support for the literature, when the findings were verified through the practicality (Hirsjärvi & Hurme 2006, 40).

These methods were chosen to support this qualitative research of finding out how learning environments would better support the learning. In benchmarking, and observation as its supplementary method, the idea was to find out how the evolution of learning concepts and environments can be seen. The interviews focused on the student experiences and the influence that the learning environments have to those experiences. Also in the interviews, observation was used as a supplementary method by observing the reactions and attitudes of the interviewees during the interviews. All these methods were also used for mapping out the aspects that need to be considered in developing the learning environments.

6.1 Benchmarking

Benchmarking is based on the interest into how others do and act. As a method it is open and flexible (Hämäläinen & Kaartinen-Koutaniemi 2002, 10). In creative benchmarking, the deepest mission is to develop one’s own competences by exploiting the ideas learned from others. Creative benchmarking can be seen as a human’s natural interest of finding out others’ competences. The usual five steps in benchmarking are: 1. Defining the developing process by self-evaluation. 2. Finding a comparing party. 3. Visiting and comparing. 4. Analyzation and presenting the findings. 5. Interpreting the results, applying and transferring them into practical work. (Hämäläinen & Kaartinen-Koutaniemi 2002, 103.) In this thesis, I went through the steps 2 to 4 by finding the higher education institutes to benchmark, visiting them, comparing them and at the end analyzing the results and findings.

The higher education institutes used for this benchmarking were Laurea University of Applied Sciences and University of Helsinki. The benchmarking is not done only to compare the pros and cons of the institutes, but to introduce the functional and variable solutions both in learning concepts and learning environments. These findings are later analyzed in the chapter of results. Both benchmarked institutes vary from BUAS. University of Helsinki is, as its name says, a university, so it is not strictly related to universities of applied sciences due to the differences in learning concepts. But, when it comes to the current and future environments of BUAS it is an excellent benchmarking object due to its long history in architecture and variability of different types of spaces. Laurea University of Applied Sciences is the other bench-

marking object, with more similarities in the learning concepts and similar values, and although it works on different campuses, every one of the campuses include a variety of academies that interact with each other on different projects and courses. When it comes to the number of students in these higher education institutes, BUAS lies in between Laurea and University of Helsinki.

The more specific targeted objectives that were benchmarked in this thesis, come both from learning environments, and learning concepts. The learning environments include the architecture of the buildings and the creative and innovative spaces they offer their students to use for learning. Examples of these spaces and architecture are illustrated with pictures in the subchapters and results. The usability and functionality of these spaces were further explored through the interviews relating the learning environments into student experiences and opinions of the students. In the interview part of this thesis, I interviewed students from different higher education institutes, including students from the institutes used in this benchmarking.

6.1.1 Laurea University of Applied Sciences

Laurea University of Applied Sciences has based its pedagogical actions on Learning by Developing model. The LbD model was developed in Laurea in the early 2000s and it has attracted a lot of interest both nationally and internationally. It has also gotten an award from the Finnish Ministry of Education and Culture from the academical year 2005-2006. The action model focuses on research, innovation and development reinforcing the regional and societal influence of Laurea. The competences improve in various development projects with different companies, communities and third sector actors. By learning through the LbD model, the learning takes place in individual learning, community learning and through building new knowledge. (Aholaa, Komulainen, Majakulma & Niinistö-Sivuranta 2016, 6-11.) According to Kallioinen (2008) the applicability can be examined through five dimensions: authenticity, an experiential nature, partnerships, a research-oriented approach and creativity.

Laurea University of Applied has also the living laboratories, mentioned in the chapter 4.1 that support the idea LbD. Support for the LbD comes from multiple aspects, from projects to student mobility and the living labs. The idea, of the students integrating into working life already during their studies, plays an important role of Laurea. This might be one of the reasons that in the statistics, Laurea holds the second place on the ranking of employment rates of the students from universities of applied sciences in Finland. The rates are based on the data collected one year after graduation. (Vipunen - Education Statistics Finland 2016). Integrating students into working life is one of Laureas' values along with internationality and entrepreneurship that are also supporting the LbD model.



Picture 1: Laurea University of Applied Sciences, campus Leppävaara, Espoo

Altogether Laurea of Applied Sciences has six different campuses in five different cities in Finland. For this thesis the physical learning environment was benchmarked in the Laurea campus in Leppävaara, Espoo, that is shown in the picture 1 above. Different academies located in this campus are hospitality management, offered both in English and in Finnish, and three different specializations in Business management, including business, IT and security. Also business management has English and Finnish degree programs. The purpose of the visits was to observe the different spaces that are available for the students to learn in, and see which spaces are being popular and how are they being used. This was done during more than just one visit, since it is the institute that I go myself. This way I was able to get a wider perspective and more realistic picture than just by one visit.

6.1.2 University of Helsinki

Compared to universities of applied sciences, University of Helsinki is different from a conceptual point of view since it is a university and more academic. The learning of the students is more conservative including different mass lectures and traditional exams in most of the studying fields. This kind of, more behavioristic concept of learning also creates different needs for the environments.

As already mentioned in the chapter 3.1 about the history of learning concepts, University of Helsinki has a long history that can be also seen in the architecture of its current buildings, both inside and outside. Examples of these buildings can be seen in the pictures 2 and 3 be-

low, that shows the facades that also reflect the dignity of the image and identity the university has. It is by far, the most difficult higher education institute in Finland to get in, and it has been very highly valued throughout the time. It is Finland's oldest and biggest higher education institute that works as an international scientific community of 40 000 students and researchers. It is also the only Finnish university that ranks into the top 100 in international university rankings. An interesting fact from a cultural perspective is that in 2017 from the 6055 degrees completed, 68,9% were completed by women. (University of Helsinki 2018.)



Pictures 2 & 3: Facades of University of Helsinki

For this thesis, and the benchmarking, University of Helsinki was visited during daytime on a normal Wednesday to get a natural, normal sense of the atmosphere and the uses of different spaces. Benchmarking was focused only on the campus area of the city center, which is the biggest area including various campus buildings close to each other. This was done by an observing walk through the premises, focusing on the differences of the buildings and spaces, and to see how the spaces were used. From the inner spaces, the main library was picked at a place to have a closer observation. The main library serves mostly the faculties of arts, law, theology, behavioral and social science that have their campus buildings located in the city center as well (University of Helsinki 2018). The library was chosen for closer observation due to its multicultural atmosphere as a space where different faculties meet and interact.

6.2 Interviewing

Interviewing as a method, is one of the most flexible research tools. It can be used in many phases of the research to gather information from different sources. With good interviews it is possible to get better insights into the experiences of the users and develop empathy with the audience that the development or designing is done for. Interviews are especially useful for getting information about the user experiences. There are three main types of interviews: structured, semi-structured and unstructured interviews. In the structured interview the script is fixed and followed throughout the interview. In the semi-structured interview, there is a combination between the fixed-script questions and open-ended questions, and in the unstructured interview there are only open-ended questions that give the interviewer the possibility to dive deeper into the topics that are being discussed about. (Tomitsch et al. 2018, 78.) In both semi-structured and unstructured interviews, it is also possible to change the order of the questions even though the questions would be the same (Hirsjärvi & Hurme 2006, 34).

In this thesis, the interview was made as a two-part interview. First, the demographic information and key attributes from the interviewees were collected and written in the background information tables, using a fixed table that can be seen in chapter 6.2.1 (table 2). This information helped to prepare the actual questions by dividing the students tentatively through their differences. When designing a service or a product, or in this case the environment, the design needs to fit different users. (Tomitsch et al. 2018, 130.) That is why in these interviews, the variability of the interviewees was a conscious decision and the interviewees were chosen from different higher education institutes, with different characteristics and different values and purposes for their studies. Even though this thesis does not specifically focus on, or include the evaluation of the cultural differences, it was seen useful to have interviewees from both, the Netherlands and Finland, since this thesis was made for a Dutch institute and conducted mostly in Finland. The background information was used as a way of mapping out this variation and it helped in understanding the experiences of the target group, in this case, the students.

The data for the background information tables was collected from the interviewees by phone or face-to-face. On the values and characteristics, the interviewees were given some examples to make it clearer, which type of information was looked for. For the unstructured interview done face-to-face, the interviewees were not given the questions beforehand, but they were given the opportunity to add something later if they thought about something specific that was missing after the interview. The decision not to give the questions to them earlier, was based on the wanted authenticity in answering and getting their real feelings by excluding the opportunity to give an answer based on what they thought that they “should” answer.

6.2.1 Background information tables

The information in the background information tables consists of the different demographics and key attributes that are shown in the table 2 below. These pieces of information were collected from all the interviewees and can be seen in appendix 2 as one table. The first questions are the general demographics but also the way of living, including the type of household and hobbies, or other activities. The values in learning and studying are used to map out the fact, that people go to higher education institutes, and choose their education field for different reasons. The reasons and values for studying can also change along the way. At last I wanted to find out how they would describe themselves as a student with a few words, to find out more about the characteristics, like the strengths and weaknesses when it comes to different ways of learning.

<p>Interviewee 1 Name: Gender: Age: School: Education field: Studying year: Type of household: Hobbies and other activities: Values in learning and studying: Characteristic as a student:</p>
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Table 2: Background information table

Creating these tables based on the attributes and demographic data, helped in seeing the differences and similarities in people's attitudes and opinions when it comes to certain experiences considering the learning environments. All the background information that was gathered for the tables was considered later when making the questions for the unstructured part of the interview.

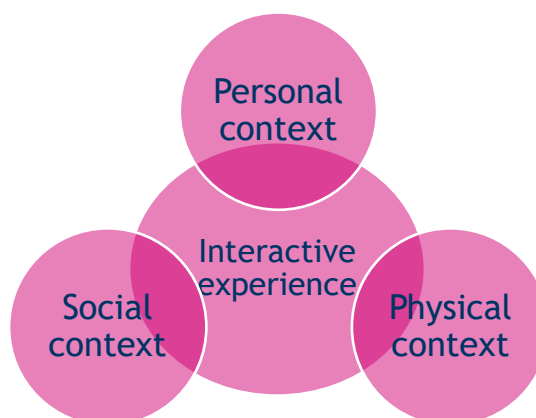


Figure 2: Interactive experience model (Dierking & Falk 1992)

When the information for the tables was gathered, I used open-ended questions to get deeper understanding about the experiences of studying. In the interactive experiences (Figure 2), there are three different contexts to focus on: social, personal and physical context (Dierking & Falk 1992). These are all part of the series of touchpoints in the experience. In the personal context it is important to find out why the person studies in a certain place, what are the desired goals for the studies and what are the needs and wants of the person considering the environments in different situations or assignments. This leads us into the physical space, the functionality, object, appearance and style of the space and the importance that the physical space has. The social context considers the facts of the social interactions, who are they studying with, who is serving them and who are they sharing the physical space with. (Smit 2018.) These contexts are tightly related to each other when we think about different kind of learning and studying and the physical spaces that the different learning environments have to offer.

6.2.2 Unstructured interview

The actual interview done face-to-face was unstructured. There are a lot of different names for this kind of open interview, but in a nutshell the main idea was to have an open-minded conversation revealing the real feelings and experiences that the interviewees have about the learning environments. During the interview, it is important that the interviewees are answering subjectively by giving them the opportunity to bring their own authentic experiences into the conversation. (Silverman 2004, 87.)

These interviews were executed as contextual interviews that took place in the learning environments. It made the situation more authentic and easier for the interviewees to relate and

consider the questions in the actual environment that was being discussed about. Even though the interviews were unstructured, they were all following the same theme. The aim was to find out how the learning environments influence the learning experiences and to find out the aspects that need to be considered in developing the environments. The questions were made after the first information data for the background information tables was collected, to get the most out of the interviewees considering their education field, key attributes and demographics.

The questions were designed with the help of an interview guide written by Hennink, Hutter and Bailey (2011, 112-120). With operationalization the theoretical concepts were removed from the questions by making them empirical and easier for the interviewees to understand. The first interview was done as a pilot-testing interview (Hennink et al. 2011, 120) to see if the questions are understandable, whether they need to be rephrased and to find out whether the interview is too long or short in relation to the outcome keeping its focus on the themes. Using an unstructured interview also gave the chance to add different type of follow-up questions depending on the interviewee and the discussion arising from the different topics. This was important since the interviewees basically only had in common the fact that they were studying in a higher education institute, but the other factors were variable. I decided to interview only students to get the results strictly from that one stakeholder group. The interviewees were picked from my social network to make it more casual and comfortable for the interviewees to tell their authentic opinions and experiences. All the students that I wanted to choose for the interviews had to be studying at least 3 years in a higher education institute. This criterion was chosen to make sure that the interviewees would have enough experience from different learning methods and environments. Longer time of studying has also shown them their own strengths and formed their opinions on the methods and environments that suit them the best.

The interviews were all recorded and transcribed. Also notes were taken during the interviews, and those were discussed with the interviewees straight after every interview, to avoid the possibility of misunderstanding. The length of the interviews was between 20 and 30 minutes. After the transcribe, the results were analyzed using qualitative content analysis. The text in the transcriptions was color coded according to the different topics that came up in the interviews. Single answers were categorized by the groups of codes. The categories were made to collectively represent the wider concepts that came from the answers. (Hennink et al. 2011, 245-247.) These categories form the subchapters in the results.

6.3 Observation

Observation is a common and basic method for research. It can even be said that all the known facts are based on the observation of reality. It has its benefits in research that is made about a rapidly changing and hardly predicted subject, like the change of learning and

working life. It is also a functional method when examining interactions. (Hirsjärvi, Remes & Sajavaara 2007, 208.) There are multiple different observation types. Observation is usually used in quantitative research but like in this thesis, it can also be used in qualitative research as a supplementary method. (Hirsjärvi & Hurme 2006, 37.) For example, the interviews done in this research created the possibility to use the interviewing situation for observation. The expressions, ways of talking and the actions of the interviewees in the situation reveals a lot about the attitudes the students have towards the different topics that are being discussed (Hirsjärvi et al. 2007, 199).

Different observation methods can be divided into two main categories, systematic observation and participating observation. In the systematic observation, the observation is strictly structured while the participating observation can be fully free and adaptive to the natural environment. Also, as the term itself says, in the participating observation the researcher is part of the observed group, not an external actor. This thesis is a qualitative research and therefore participating observation suits well to the research, and for me it was an obvious choice since I am a student myself. Participating observation can be sorted into smaller pieces by the comprehensiveness of the participation. In this thesis the observation was done by fully participating the researched group, students. This can be seen difficult from an ethical perspective and it is important that the observation is kept apart from own interpretations of the observation. (Hirsjärvi et al. 2007, 211-212.)

The observation done in this thesis was done during the benchmarking and the interviews. Contextual interviews, that took place in the higher education institutes where the interviewees studied, created a possibility to observe the environments also in the institutes that were not part of the benchmarking. During the interviews, I observed the attitudes towards the questions and the subjects as well as the actions on the campus area and institute premises. The notes that I wrote during the interviews also included the notes of the observation. When developing the learning environments including the students as a stakeholder group, I found it important to observe if they were really interested in the subject, and which themes caused the biggest reactions and most discussion. The benchmarking part added the possibility for more overall atmosphere observation in a larger perspective, for example observing the students that were using the institute premises for their free time studies.

7 Results

By going through the benchmarking in Laurea and University of Helsinki, the biggest difference between the institutes could be seen in the resources. The location of University of Helsinki, with many campus buildings located in the city centre of Helsinki, gives a very elegant and dignified feeling about the institute. The history can be seen in its oldest buildings and resources have not been spared when building the new modern ones. During the benchmarking, the whole area was bustling with students doing individual assignments, group work or

just hanging out. The feeling was energetic and busy. I could not get in to the lecture halls or classrooms, but observing the public spaces, like the library, gave a good insight on the use of the spaces.

Compared to the other benchmarking location, Laurea University of Applied Sciences, the University of Helsinki had livelier atmosphere. In Laurea University of Applied Sciences, the corridors, halls, library and all other public spaces were a lot less popular and seemed to be available at most of the times during the benchmarking. But there were also a lot of different spaces to use for different types of learning and the idea of flexibility was well considered in the furniture and the use of the spaces.

For the student experiences I interviewed in total four students studying in higher education institutes. The background information about the interviewees including the demographics and the key attributes can be seen in appendix 2. Even though there were big differences in the background information, there were also a lot of similarities when it comes to the experiences and opinions about studying and learning. As can be seen in the table (appendix 2), I interviewed one student from both institutes that were benchmarked in this thesis. The other two interviewees were both studying in the Netherlands. The two interviewees studying in the Netherlands were studying their master's degree and had received their bachelor's degree from a different institute. The interviewee 3 had studied earlier in another Dutch higher education institute while interviewee 4 had her earlier diploma from a Finnish institute. To cross the cultural aspect by one sentence, there was not seen a big difference culturally, considering the studying experiences nor the learning concepts and methods.

7.1 Efficient use of space

In the University of Helsinki, there were different types of areas for different kinds of studies from technology room full of computers, to isolated group work spaces and silent spaces where it was possible to work on your own computer. The library building was huge, and it offered spaces for all type of studying that are shown in the pictures 4,5 and 6 below. By the time I visited the location, there seemed to be plenty of room for everyone.



Pictures 4,5 & 6: Library working spaces of University of Helsinki

Also in other buildings the public spaces seemed to be used efficiently as studying places. For example, a campus building called Minerva, an old building entirely renovated from inside, had spaces that were flexible and suitable for group work as well as for individual assignments. It had both isolated rooms and bigger spaces with different kind of chairs and tables. Some of these spaces looked like they had been big halls that were turned into studying spaces. An example is presented in the picture 4 below, and it offers the students a flexible space that can be used for group work, also including a big screen that gives more variety for the uses of the space.



Picture 7: Flexible studying space in University of Helsinki, Minerva building



Pictures 8 & 9: Corridors turned into studying spaces (Laurea on the left, University of Helsinki on the right)

In both of, Laurea and University of Helsinki, the efficient use of space was well executed. With different kind of variations, the corridors and halls were taken advantage of by turning them into studying spaces. In the pictures 8 and 9 above, there are pictures from both institutes and their corridors where they have designed studying spaces. In the picture from Laurea, the chairs are designed to better isolate the distractions, and the space can be used for

both group work and individual studying. In the picture from University of Helsinki, the corridor is turned into more informal space with comfortable chairs that are easy to move around and rearrange into different forms, making them also suitable for groups or individuals.

7.2 Accessibility of studying spaces

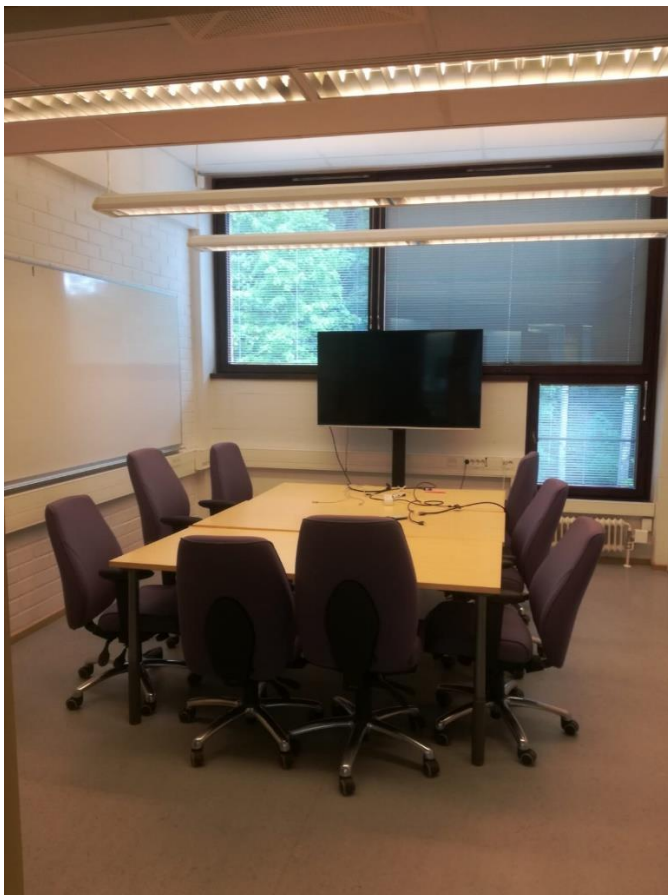
Like mentioned briefly in the earlier chapter, there are a good amount of different types of studying spaces in both Laurea University of Applied Sciences and University of Helsinki to serve the needs of the students whether they need a space individually or for a group. Both institutes have libraries with extra computers for students to use, as well as specific computer rooms where students can do their individual or group work if they don't own a computer or they are not carrying it with them. Also group work spaces can be found both in public areas and as isolated rooms with bigger tables and multiple chairs.

The problem seems to be that those are often occupied. Through the interviews I found out that for example in University of Groningen, there is a limited amount of times a student can reserve a room for group work, and that the reason for the limitation is that the rooms are so popular. This means that there is a consistent need for more group work spaces. In Hanze, on the other hand, there is a possibility to reserve a group work space or even a classroom for studying, but it is not possible to do it online. This means that a student needs to go all the way to the premises to find out if there is space. This decreases the motivation for the use of the school premises on free time, if you are often disappointed by the fact that there is no space available, according to interviewee 4 from Hanze University of Applied Sciences.

In Laurea, there is a possibility to reserve rooms for studying on free time. Some of the spaces are available for booking online, but not all of them. Actually, there is usually always a room available, which students can have for their use by asking from the janitors, but as it turned out in the interview, the interviewee 2, from Laurea, did not know about this possibility. Since I am also a student in Laurea myself, we discussed about this in the interview, and concluded that the marketing and communication about the use of these opportunities should be better. To get more efficient use of the capacity in the premises, and to support students learning better with the spaces, students should be better informed about the possibilities they have considering the use of the learning spaces. The disappointment was easily observed through the reaction of interviewee 2, who was studying her 4th year and said that this information would have been useful in different situations during the earlier studies.

At Laurea, there were also isolated group work spaces, but those were not that often occupied. Picture 10 below, shows an example of a group work space that is available for the students to reserve for their studies. Nevertheless, only a few students are taking advantage of this possibility, which is surprising considering the fact, that most of the courses include group assignments. Overall, walking around the premises of Laurea, including the library and

other public spaces, it became clear that not so many students are studying at the school premises on their free time. During the multiple moments when the benchmarking was conducted in this location, most of the students studying in the library were exchange students.



Picture 10: A group work space in Laurea University of Applied Sciences

Another important aspect to consider, is the accessibility. In addition to the possibility to reserve and the availability of the useful spaces, the location of the learning spaces also contributes to the extent to which they are used by students. Through the interviews, it seemed that the location has a lot to do with the motivation of the students to use the school premises for free time studying. Interviewee 3 had the strongest opinion in the sense that he would never go to study at the school on a day off. This also stood out with interviewees 2 and 3. If the location of the school is far away from the home of the student, it is frustrating to go there without an actual reason. This also includes the classes that are not seen useful or of which the students feel that they are not getting extra value for the learning. If a student already is at school for some reason, either a lecture, group work meeting or other, they more likely stay there to study their homework, but it is not the place to go without a reason if the location is not convenient. This also sets aside the University of Helsinki that is in the middle of the city centre, with good traffic connections, which might be the reason that only

interviewee 1 did not mention the location as a minus when it comes to studying on campus, and why University of Helsinki seemed to be a popular place for free time studying while visiting it for the benchmarking.

When it comes to virtual environment, accessibility also plays a vital role. The interviewees were happy with the fact that they can use all the needed platforms to work from home, or any other space that has internet access. But still, one minus was mentioned by all the interviewees considering all the institutes these interviewees came from, and it was the quality of the material existing in these platforms, and the lack of support given by the teachers when it comes to the virtual learning. All the interviewees mentioned that deficient briefing has a decreasing effect on the motivation of the student executing an assignment online. Whether the assignment is unclear, or the material is not available, it often leaves student in frustration and lacking the motivation needed for executing the assignment. For example, as most frustrated part of virtual studies and environments, interviewee 2 mentioned that if the assignment is unclear, and the teachers are not answering the questions in appropriate time, it leaves the feeling that you have no idea what you are supposed to do and that it is not worth trying.

7.3 Social environment

Through the interviews, social environment seemed to be an important aspect in all learning. For interviewees 2 and 4 it was important, that if you are doing an individual assignment, including reading or writing, there cannot be other people in the same space. It is not enough if the others are not talking, just their presence is found distracting when you need to stay focused on studying. For interviewee 3 it does not matter at all, who is in the space, since he is always listening to music and he finds it easy to concentrate on his own. However, for interviewee 1 it is better if there are other people in the same space, since she finds it hard to concentrate if it is too quiet. When it comes to individual assignments, interviewee 1 likes to study in the lobby of the student association place, not in the reading room, and interviewee 3 likes to study at home.

When the students were telling about their experiences on their favourite courses and how have those been implemented, two of them mentioned the project courses that were done in cooperation with working life. A presence of a person, representing the company and doing the project as a job was mentioned to bring more professional feeling into the project. The presence of a working life representative gave the students the feeling that they are doing something meaningful and practical. It was mentioned to make a big difference compared to the group work without a link to working life especially in Hanze and Laurea, where group assignments are included in most of the courses.

The most important aspect of social environments that was identified in all the interviews was its importance in the group work. Interviewee 2 expressed really strongly her opinion of including group work in too many courses. She felt that it is sometimes included even though it does not add any extra value to the learning and therefore does not feel meaningful or concrete. Even though interviewee 2 told that brainstorming and ideation in a group are her favourite methods of learning, she was agreed with all the other interviewees that more important than just the group work as a method, is the group dynamics. It seemed to be hard for the interviewees to trust in their studying colleagues, when it comes to the type of group work where everyone learns their own part individually and are then supposed to teach it to the others. Also, in execution of the assignments, trust issues were mentioned when it comes to the fact that the work of others influences your grades. Interviewee 1, studying law, mentioned that she feels like doing double the work, since she needs to teach the others, listen to them, and anyway read and learn others' parts afterwards to make sure that the taught facts were correct. All the other students, with a lot more experience from working in groups, had also positive experiences about group work. What came up from the negative experiences was that the negativity was mostly about the people in the group. To develop the methods in developing the social environment, all the interviewees support the idea of putting a lot more effort into forming the groups for group assignments, and to rethink the method of evaluation considering the group work. Interviewee 3 mentioned an evaluation of one course he had found functional, where the students got separated grades from individual and group work. All the interviewees also mentioned that the teacher evaluating the process should be more involved and aware of the process to see how the individuals in the group are doing their parts and how the parts are divided.

7.4 Physical space

The theme interviews were about learning environments considering all physical, social and virtual environments. The most concrete of these, that I got the most results from, was the physical environments. There is a variety of needs and wants when it comes to different type of students and learning methods. The physical environment is important for learning from many aspects. Like mentioned in the social environment part, two of the interviewees like to study mostly at home, but two of them had strong opinions on the fact that they felt too distracted at home. Interviewee 4 mentioned that it is also easier to divide the studying time and free time by going to another location, and it helps to work more efficiently when you are not just making time for your studies, but also using another space for it.

One aspect that matters for the interviewees in the physical space is the technology, and the usability of it. It is seen as a very important factor that there are enough plugs for all the devices needed, and that those are in convenient places in relation to the furniture. In group work spaces it is good to have a big screen or a tv where the group work, like a slide show,

can be reflected from a computer. This makes it easier to make all the group members involved in the working part. Another important factor mentioned by interviewee 2 is a functioning ventilation. A room that is too hot, too cold or has poor quality of air has a negative impact on focusing a task.



Picture 11: Flexible classroom in Laurea University of Applied Sciences

The furniture and the flexibility of the space was also found as an important factor by all the interviewees. Traditional class rooms are found to be passive and not inviting to active participation in the learning process. Interviewee 4 said that when the classroom is traditional, the teacher is in the front and all the chairs are in straight rows, it automatically gives the feeling that you are there to listen and to make notes. By at least rearranging the chairs into a circle keeps you more awake and ready to join the conversation and answer the questions asked, making the space more inviting for interaction. Wishes of the interviewed students were that the spaces, especially in group work, would have multiple options in the chairs and tables. The spaces should be more informal to create a more inviting atmosphere for interaction. The concrete examples that came from the interviews according to the flexibility of the spaces were that there should be a possibility to either sit or stand up, and maybe adding some couches or beanbags for a relaxed conversation when the assignment is focused mostly on discussion. The meaning of the interviewees was not to put all the options in one space, but to increase the variety of different spaces to study in, by making them more flexible and serving different purposes. For example, interviewee 2 from Laurea University of Applied Sciences mentioned that the smaller classrooms, that are not very convenient for serving a full-sized class, could be turned into more informal spaces. These could be used for relaxed discussion sessions, where students could for example go through their project plans or presentations.

There are some classrooms that are made flexible, but for example a classroom shown above in the picture 11, is a full-size classroom, but there should be more specific rules in this type of spaces, since most of the time the room is so messy that it does not serve the needs of anyone and it takes a lot of the efficient studying time to fix and clean it to serve the needs.

7.5 Increasing motivation and creativity with physical space

It was said in the interviews that the motivation plays a vital role in learning. In the contextual interview number 3, that took place in the campus area of University of Groningen, the interviewee mentioned how big difference it makes, that the building sets an example on the subject the students in it are studying. He mentioned as a good example a building serving the students studying sustainable energy. The whole building is covered up with solar panels and it produces 100 per cent of its own energy (Picture 12). The interviewee 3 was also doing his masters' thesis related to sustainability and energy efficiency, and said, that it gives a big amount of inspiration and increases the ambition to do something meaningful himself as well. He said that it works also as a good reminder of the development we have already achieved when it comes to sustainability and that it gives a creative and hopeful feeling about the future.



Picture 12: Campus building from University of Groningen

In the benchmarking, I also felt the influence that the physical space has on the motivated and ambitious feeling that I got from the students and the atmosphere. This of course has a lot to do with the social environment, but also the physical innovations are there. The entirety of the University of Helsinki includes attractions for visitors from museums to gardens

and an observatory. These attractions are just a small amount of the innovations that are being implemented by the University, but they give an example of the creativity and substance that prevails in the premises. It sets a motivating atmosphere for the students and helps them in finding out their own ambitions during their studies.

When it comes to the location of the physical space, it was mentioned in the interviews that being able to work in the premises of different companies felt inspiring and gave a more professional feeling to the students. Also other places, like the big buildings that bring together different innovative start up companies, often provide a creative and inspirational environment, according to the interviewees 3 and 4 who are studying in The Netherlands. Overall, based on the interviews, using company spaces even as a small part of a course or a project are experienced to increase the feeling of doing something concrete and to increase the students' creativity and motivation.

8 Discussion

It is easy to see both from the literature review, and the results, that the learning environments are important part of the learning. The results are supporting the literature review of this thesis with multiple similarities. To develop the learning environments better support the learning, the social, physical and virtual aspects should all be considered. The importance of considering these aspects is increasing through digitalization.

As the literature review shows, the learning is becoming more student-centred and already many of the higher education institutes are offering more personalized study plans. If the responsibility of the learning is transferred to the student, the student should also have the possibility to choose the best fitting learning method and environment for himself. This includes virtual studies, group learning and individual learning. If the institute wants to consider the individual needs, it should develop different kind of environments and make the existing ones more flexible to better meet the student's variable needs.

In order to support the constructive learning conception, the learning environments should encourage the interactions. The flexibility of the spaces was found to play a vital role when it comes to the support of different learning environments. The possibility to influence the furniture and atmosphere in different spaces, is important for the interactions. From the interviews it turned out that the formation of the furniture has a lot of influence into the feeling a student gets when entering the space. If the classroom is full of chairs, side by side, and behind one another, it sets the focus point on the teacher and the screen in the front. If the chairs are set in a circle or they are easy to move around, it gets a student to feel more active and gives the teacher the possibility to better interact and work with the students instead of lecturing and giving all the information from the front to a passive audience.

When it comes to flexible spaces in a physical sense, there needs to be both formal and informal spaces. It turned out both in interviews and literature review, that the students feel more comfortable studying in a place where they have the same possibilities as studying at home, like easily getting coffee or food when needed. Informal spaces are also the spaces that fit better for discussions with other students or teachers and helps in the creative work. This leads us into the future predictions, where the literature review showed that the creative jobs are increasing towards the future and as one of the most important 21st century skill, the creativity should be increased and encouraged in the learning and be supported by the learning environments.

One of the topics that can be found from the interview results was the practicality of the use of virtual and physical spaces. The virtual platforms need to be clear and functional to make the studying more motivating. Also, the introductions of the courses and assignments should be clear. It is not motivating to use a lot of time trying to find the right material or assignment from the platform, or trying to figure out what you are supposed to do, when the introduction of the assignment is unclear. In physical spaces, the practicality as a topic came mostly from accessibility and efficient use of spaces. Online booking and making more spaces available for studying supports the efficient use of the spaces. Like the interview results showed, there is a need for the spaces, but it is not motivating to use a lot of time to get to the school if a student is not sure that there is a space for that student to use. I think that one of the most practical development ideas for an institute is to invent an online booking system that would cover at least most of the studying spaces.

Some good examples of improving the flexibility, accessibility and efficient use of the spaces were found through benchmarking. The efficient use of the corridors, halls and a possibility to use an empty classroom for free time studies, like in Laurea, increases the opportunities that the students have for different type of studying using the institute premises. The flexible spaces seen in University of Helsinki, were made more creative and innovative with small things, like the colours of the red chairs, and adding technology, like the big screen into a big hall (picture 7).

As the interviews showed, the motivation is an important part of the learning experience. The motivation can be supported by providing meaningful and concrete projects with working life and adding more professional physical and social environments with the possibility to work with the working life representatives and to combine physical environments of the institute and the company. Also, when it comes to the motivation in project-based learning, it is important to focus on the formation of groups and evaluation of the group assignments. When it comes to the group assignments, the group dynamics had the most effect on motivation based on the results. This could be an interesting and useful subject for further research to develop functional systems for group formation.

This research showed that there are multiple individual needs and ways to learn. Most of the interviewees, despite their different preferences on learning, said that the mix of methods and environments is providing the most freedom and motivation to the studies. Therefore, it can be seen, that depending on the institutes resources, there should be a variety of options to conduct a course in order to provide most of the students an opportunity to learn the most efficiently according to their own needs and strengths. The same course could be provided as a traditional course, virtual course, intensive course or project-based course. This would increase the motivation of the students and give them the possibility to have more influence on their own learning.

Evaluation of the thesis

It is important to look at the research from a critical point of view. The subject of the thesis is wide, and it is a subject where all the components are changing and therefore the validity of this research is limited by time. The literature written about the subject includes multiple perspectives that are not possible to include in one thesis, but in this thesis the list of used sources is comprehensive, and the literature is used diversely. To improve the efficiency on the use of literature, the subject of the thesis could have been defined to be more specific in the beginning.

The structure of the thesis is simple and logical. In a nutshell, it includes the introduction, literature review, methods, results, discussion and conclusions. The validity of this qualitative research is increased by using more than one method. The methods, and the use of the methods is made transparent by describing all the phases from collecting the data to analysing the data and turning it into results. The pictures from the benchmarking add value to the validity and make the results easier to read. There could have also been more pictures from the contextual interviews, which would have made the results even easier to read and have a more visual look.

The benchmarking in this thesis could have been more well planned to be able to provide more specific outcomes. With more precise planning of the benchmarking, I could have also added the two Dutch higher education institutes where the other interviewees were studying, to the benchmarking. Although those institutes were not involved in the benchmarking, the contextual interviews gave a little insight on the school premises both by the interviewees and by observing the premises while interviewing. Observation gave a wider perspective into the benchmarking and the interviews by working well as a supplementary method. But also, the planning of the observation could have been more specific about the aim of the observation.

In the interviews, there was a good rapport with the interviewees since they were chosen from my own social network and there were no boundaries in discussing about the issues that

were discussed about. The validity of the interviews could have been better with more interviewees, but it was a good to have the interviewees from different countries and different institutes to get as wide perspective as possible despite that there were only four of them. With the interviewees that had very different backgrounds and studying fields I think I got a lot of results representing the variety of the students.

For the Breda University of Applied Sciences this research brought examples of interesting practices and systems that are used in other higher education learning environments. From the perspective of BUAS it is always interesting to see what other institutes are doing, to provide their students more optimal learning environments. Since the idea of this thesis came from the EuroFM Summerschool that I attended in BUAS, they also appreciated that I had used some of the same theoretical concepts that were used in the Summerschool.

9 Conclusions

The aim of the thesis was to find out how the learning environments would better support learning. Three research questions were made to support this aim. First research question was about the evolution and future predictions of learning concepts and learning environments, and their relation to each other. The second research question was about the learning environments effect on the learning experiences of students. The third one was to find out the different aspects that need to be considered in developing the learning environments.

Through a long history of changing learning concepts, currently the learning concept that is mostly used is constructive. This means that the social environment and interactions need to be considered in development of the learning environments. From the physical space point of view, the spaces need to be flexible and encouraging for interactions in order to support the constructive learning concept.

Individual students have different needs and preferences. The higher education institute premises should offer multiple different studying spaces and make them flexible to serve the majority of the students. Social, virtual and physical aspects have all influence on the learning experiences. The virtual platforms should be functional and the introductions for the virtual assignments should be clear. The physical spaces should be accessible, and they should be more efficiently used. This can be achieved with online reservation for the spaces and adding studying spaces to corridors, or turning an unfunctional classroom into flexible space for free time studies. The flexibility can be achieved with a variety of mobile furniture, and they can be formal or informal depending on the purpose.

21st century skills are one of the important aspects that need to be considered in development the learning environments. The key qualifications that BUAS wants their graduates to have, are also part of the 21st century skills. Development of these skills can be supported

with creative and collaborative spaces. The interviewees all thought that the possibility to choose the learning method and environment that suit them the best, would increase the motivation and make the learning more efficient. This also develops the self-direction and responsibility that are part of the career and life skills and supports the vision and mission of BUAS.

For BUAS to achieve the purpose of increasing interactions on the new campus and between the different academies they could develop more public spaces for all the students to use. Also, adding informal spaces would create more networking and discussion between the students. To serve better the individual needs, BUAS could do further research on the needs and preferences internally for the students on the campus. This thesis could be used as a base of different subjects to use in the further research.

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Appendix 1: Questions of the unstructured interview

1. What kind of courses have you liked the best? (example projects, virtual courses etc.) Tell about the favorite courses.
2. Why have you liked them?
3. What kind of courses have you liked the least? Why have you liked them the least?
4. Where have you studied on these courses?
5. How did the studying spaces effect on your studying experience? How did you feel?
6. How do you like to study the most? Why?
7. Where do you like to study the most? Why?
8. Which environments work the most efficient for you considering the learning? Why?
9. How do you think that the learning environments should be developed to be more useful?

Appendix 2: Demographic information and key attributes of the interviewees

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
Gender	female	female	male	female
Age	25	26	26	28
School	University of Helsinki	Laurea University of Applied Sciences	University of Groningen	Hanze University of Applied Sciences
Education field	Law	Hospitality management	International economics and business (master's degree)	Healthy ageing professional (master's degree)
Studying year	4	4	2	2
Type of household	living alone, 3 three cats	living alone, one cat	Living with a girlfriend	Living with a boyfriend
Hobbies and other activities	student organization activities, working in a bank, hanging out with friends	boxing, hanging out with friends, blogging	movies, reading, travelling, hanging out with friends	different kind of sports, reading, movies
Values in learning and studying	passion for law, networking, grades not so important, importance of educating herself	wanting to educate herself to a well-paid job, want to develop herself, grades not the most important	aim to get good grades, values the actual learning and developing knowledge	self-developing, curiosity in learning new thing, education opening up new opportunities for the future, wants to learn by doing something concrete and learn from that
Characteristic as a student	individual learner, likes reading and taking notes, easily stressed, always leaving everything to the last minute before deadline	passion for writing and reading, likes more individual assignments, wants to focus on theory before going to practical parts of assignments	starts assignments directly when given, doesn't like the "last minute" persons/lazy persons, in a group likes to be the one observing that everyone is doing their tasks and pushes them if needed	need for deadlines to get things done, works better under pressure, good at writing (in Finnish, English and Dutch), loves essays, observing person in a group, good listener, concentrates on one thing at a time
Additional information			earlier degree in human resource management from Windesheim University of Applied Sciences	earlier degree in physical therapy from Metropolia University of Applied Sciences (Finland)