LAPPEENRANTA-LAHTI UNIVERSITY OF TECHNOLOGY LUT
School of Engineering Science
Degree Programme in Industrial Engineering and Management

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SERVICE DESIGN OF A COOPERATION MODEL TOWARDS EDUCATION EXPORT

Master's Thesis

Examiners: Professor Ville Ojanen
D.Sc. (Tech.) Nina Tura

ABSTRACT

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Service design of a cooperation model towards education export

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Keywords: education export, education export model, Lappeenranta Junior University, LUT Junior University, LUT University, service design, service design process, service model, standardized service module, transnational education, Uniori

LUT University has been developing cooperation related to the activities of children and young people with various partners over the past years. This has led to the launching of the collaboration model Lappeenranta Junior University, Uniori, together with the city of Lappeenranta. The purpose of Uniori is to create an equal path for children from preschool to higher education regardless of the backgrounds of the children or their parents. As a result, Uniori's activities are recorded as part of the local supplementary curriculum. Uniori promotes interest in science and technology while integrating sustainable development themes into education. Through various international awards, LUT has received global attention for its work on sustainable development with Uniori.

Service design and education export are constantly evolving as their importance in business and in society grows. By interviewing Uniori collaboration partners from the university, the city, and the school teaching staff, a clear concept of the operation has been formed by this thesis. Utilizing service design and education export themes with the research conducted through the interviews, it has been possible for the author to create a new service model (NSM) from the basis of Uniori.

The purpose of the NSM is to enable similar activities to Uniori in the rest of the world, as the model can become an education export model for LUT. The NSM leads a customer, such as a foreign primary school, to collaborate with a local university partner and a network of local businesses. Together, they form a new collaborative network that sustains the operation of the model. The NSM consists of standardized or customizable modules that support the objectives of the model. Through the cooperation, the customer can develop the local community on a more sustainable basis creating equal opportunities for all children, now and in the future.

TIIVISTELMÄ

Lappeenrannan-Lahden teknillinen yliopisto LUT
School of Engineering Science
Tuotantotalouden koulutusohjelma

Aino-Maria Hakamäki

Yhteistyömallin palvelumuotoilu kohti koulutusvientiä

Diplomityö
2021
98 sivua, 24 kuvaa ja 12 taulukkoa
Tarkastajat: Professori Ville Ojanen ja TkT Nina Tura

Hakusanat: kansainvälinen koulutus, koulutusvienti, koulutusvientimalli, Lappeenranta Junior University, LUT Junior University, LUT-yliopisto, palvelumuotoilu, palvelumuotoiluprosessi, palvelumalli, standardoitu palvelumoduuli, Uniori

LUT-yliopisto on viime vuosina kehittänyt lasten ja nuorten toimintaan liittyvää yhteistyötä eri kumppaneiden kanssa. Tämä on johtanut yhteistyömallin Lappeenranta Junior University, Uniori, käynnistämiseen yhdessä Lappeenrannan kaupungin kanssa. Uniorin tarkoituksena on luoda tasapuolinen polku lapsille esikoulusta korkeakouluopintoihin riippumatta lasten tai heidän vanhempiensa taustoista. Tästä johtuen Uniorin toiminta on kirjattu osaksi paikallista täydentävää opetussuunnitelmaa. Uniori edistää kiinnostusta tieteeseen ja teknologiaan ja integroi kestävän kehityksen teemoja koulutukseen. LUT on saanut kansainvälisten palkintojen avulla maailmanlaajuista huomiota Uniorin kanssa tekemästään työstä kestävän kehityksen hyväksi.

Palvelumuotoilu ja koulutusvienti kehittyvät jatkuvasti, sillä niiden merkitys liiketoiminnassa ja yhteiskunnassa kasvaa. Haastattelemalla Uniorin yhteistyökumppaneita yliopistolta ja kaupungilta sekä koulujen opetushenkilöstöä, on tämän diplomityön myötä muodostettu selkeä käsitys Uniorin toiminnasta. Hyödyntämällä palvelumuotoilua ja koulutuksen vientiteemoja, olen haastattelujen kautta tehdyn tutkimuksen avulla voinut luoda uuden palvelumallin (NSM) Unioriin perustuen.

NSM-mallin tarkoituksena on mahdollistaa Uniorin kaltainen toiminta muualla maailmassa, sillä mallista voi tulla LUT:n koulutusvientimalli. NSM tukee asiakasta, kuten ulkomaista peruskoulua, tekemään yhteistyötä paikallisen yliopistokumppanin sekä yritysverkoston kanssa. Yhdessä ne muodostavat uuden yhteistyöverkoston, joka ylläpitää mallin toimintaa. NSM koostuu standardoiduista tai muokattavista moduuleista, jotka tukevat mallin tavoitteita. Yhteistyön avulla asiakas voi kehittää paikallisyhteisöä kestävämmin ja luoda yhtäläiset mahdollisuudet kaikille lapsille nyt ja tulevaisuudessa.

FOREWORDS

The start of the thesis included a lot of listening of more or less unusual music as friends and family came to notice. At first, the feeling was naive confident about the work ahead, and I couldn't expect how hard the work really was going to be. After that, I panicked with friends and family from whom I received support throughout the process.

Self-improvement has been a hot topic for me in the past year in the middle of a worldwide pandemic. This has centralized to improving learning and working methods to a whole new level. Writing the thesis and executing the research is a true test for anyone, but now the learned methods and improvements took on a new meaning. Keeping in the schedule for writing the thesis in about six months was the goal of the writing process. But as usual, life tends to mix things up and gladly the completion of the thesis did not stretch too much of the goals.

Over the past spring and summer, I learned a lot about myself, found new friends despite the corona situation, tried new hobbies like kayaking and got married. Much has been happened in such a short time, but every moment has been its own, from joys to exhaustion.

The process has required different levels of self-discipline at different stages. Getting started was a test of its own, as noted. I haven't conducted interviews before, so they brought new challenges from designing functional frame to analyzing the data in useful format. The last challenge was to return the thesis to the examiners, as I constantly felt that something significant was still missing. Now while I'm finalizing this text and trying to realize how to write a good and compact abstract, I'm already looking forward to leaving the thesis behind and finding those new challenges ahead.

4.8.2021

Aino-Maria Hakamäki

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ABBREVIATIONS

OECD	Organization for Economic Co-operation and Development
PISA	the Programme for International Student Assessment
LUT	LUT University
TNE	Transnational education
TUAS	Turku University of Applied Sciences
Uniori	Lappeenranta Junior University
Universoma	Imatra Junior University

1 INTRODUCTION

In recent years, the importance of service design and concepting in service research has grown (Oertzen et al. 2018). While many organizations develop services around their products to promote them better, others focus purely on service production with the main emphasis on developing services even further. One form of service that attracts growing attention is education export. Researchers have started studying the topic more since the mid-2000s when universities' interest in various global opportunities, like transnational education, has been changing (Juusola & Räihä 2018). Various studies focus mainly on the export of university education to foreign universities. This thesis focuses on a new kind of concept: export of university education to comprehensive education via cooperation model.

To facilitate the understanding of the terminology of the thesis, the vocabulary of the Finnish education system is reviewed here shortly. Preschool (*esikoulu*) takes place before the actual school on the year a child turns 6 years old. Comprehensive school education (*perusaste*) or primary education (*peruskoulu*) includes primary school (*ala-aste*) and lower secondary school (*yläaste*). Primary school includes grades from one to six and lower secondary school grades from seven to nine. For upper secondary education (*toisen asteen koulutus*) there are mainly two options: high school (*lukio*) or vocational school (*ammattikoulu*). (Ministry of Education and Culture 2018)

1.1 Background

One target of Finnish education is making it equal and open for everyone e.g., society offers free educational options, and any education can lead to an upper level of education. However, one major challenge is the so-called inheritance of education: children often choose the same level of education as their parents have. For example, on average 21 percent of Finnish girls complete a master's degree or higher level of education. If their mother has only primary education, only 12 percent of girls complete a master's degree or higher. Not only the level is inherited but also the field of work e.g., if their mother

works in the female-majority sector, children more commonly choose the same sector. (Keski-Petäjä & Witting 2016)

Although Finland is a pioneer of equal education compared to many other countries, the number of higher education degrees (master's degree or higher) does not yet appear positively in the statistics. Organization for Economic Co-operation and Development (OECD) reported that the share of the highly educated population is lower than the average in EU countries or OECD member countries. The Finnish government has constantly increased the potential intake positions of higher education so that 50 percent of the population (aged 25 to 34) will have a master's degree or higher by the year 2030. (Pantsu 2019) Between the years 2020 and 2022 there will be 10 200 new potential intake positions of which 25 percent will be in the technical field (Ministry of Education and Culture 2020). Such changes will support higher education institutions such as LUT University (henceforth LUT), as it is not enough to consider supporting children and young people towards higher education if the number of students admitted to the university is too limited. Different actions have an impact on the overall picture and adding intake positions is one of them.

In addition to the topics mentioned above, sustainable development plays an important role for society at the present and in the future, so its integration into education plays a significant role in every level of education. Sustainable development is recorded as part of the LUT's Trailblazer 2030 strategy, which includes some of the United Nations' Sustainable Development Goals. These goals are presented in Figure 1. In addition to these goals, LUT is involved in numerous international and local cooperation networks aimed at supporting sustainable development. (LUT University n.d.a)

Figure 1 LUT's sustainable development goals of UN (LUT University n.d.a; United Nations n.d.)

When these themes are brought together and the education of children and young people is considered, there has been a need for a new model of cooperation. LUT has been developing collaboration with local schools for over twenty years. This has led to the launching of LUT Junior University which includes all LUT's cooperation activities with children and young people. In close collaboration with the city of Lappeenranta, LUT has been developing a new cooperation model: Lappeenranta Junior University (henceforth Uniori). This collaboration has gained worldwide attention e.g., in 2020 LUT Junior University won the International Sustainable Campus Network award and pointed out its contribution towards this cooperation model (LUT-yliopisto 2020). With Uniori, it has been possible to support children's orientation towards higher education by integrating it into the curriculum of local schools. When offering university teaching from preschool through comprehensive school education, it is easier for children to choose a path that differs from their parents' education as university education will also become familiar to those children whose parents do not have an academic background. This also strengthens the retention of local people in their original domicile, which will ensure a long-term skilled workforce for companies in the area, if they offer attractive job opportunities.

Science Education Development Working Group (*Tiedekasvatuksen kehittämistyöryhmä*) noted these issues and suggested that the aim of different science education environments should be to develop new types of learning environments to address the challenges of

children's and young people's interest in science by supporting equality in teaching and learning (Ministry of Education and Culture 2014). LUT is not the only Finnish university that supports the interest of children and young people. Aalto Junior and Juniversity of Tampere are examples of universities cooperating with local schools. In contrast to them, Uniori's activities are not leisure club activities and therefore not dependent on the own interests of the children or their parents. Uniori program is strongly tied into the local curriculum, so that teaching reaches the entire age group, and it is also not dependent on the interests of an individual teacher.

1.2 Objectives and scope

The thesis aims for gathering a better overall picture of the status of Uniori program and to apply theories found to start concepting Uniori by using service design methods. The preliminary service model then operates as the basis for creating education export activities based on the concept of Uniori. As Morelli (2009) put it: *"The result of a development process for a service is never perfectly defined, but it should rather be a system of components (or modules) that can be joined together in different configurations."* The purpose of the thesis is not to create a finished end product but to gather initial data for further research purposes, while the optimal result would be a framework for a new service model.

The Finnish education system is unique and different, as it reflects the values and know-how of Finns. People have come around the world to study and embrace these skills and knowledge as part of their own teaching culture. Uniori program does not directly depict the whole of Finland but is itself a unique part of it. Combining the two and exporting them abroad makes it possible to commercialize a completely new kind of experiential service product. Research questions and objectives set for the thesis have been gathered in Table 1.

Table 1 Research questions and their objectives

Research question	Objective
RQ 1. How a service concept should be formed based on Uniori?	Obtain an overall picture of Uniori's background, in what ways it has been developed over the years, and how it has been implemented, especially in Lappeenranta. Also, study why it should be conceptualized as a service for further research and how to concept these types of services
RQ 1.1. How Uniori has been implemented on Lappeenranta?	
RQ 1.2. Why Uniori should be conceptualized?	
RQ 2. How a new service model should be built for education export?	Expand knowledge of current options of education export activities and find the best solutions for this model. Acquire background knowledge of the desired benefits set for the model. Also, develop base guidelines for how this knowledge could be implemented in different schools and cultures by the model.
RQ 2.1. What are the education export options?	
RQ 2.2. Why develop a service model based on Uniori?	
RQ 2.3. Which are the best suitable guidelines for the implementation of the model?	

Uniori program consists of preschool, 3rd grade, 5th grade, 8th grade, and upper secondary school (high school). For the thesis, upper secondary school is excluded and the focus of the thesis is on preschool and comprehensive school education. In Finland, primary education and upper secondary education are mandatory education (*oppivelvollisuus*) while preschool is not mandatory although recommended. The obligation begins when a child turns seven years old and ends after a young completes mandatory education or turns 18 years old (Ministry of Education and Culture 2018; Ministry of Education and Culture 2021), but it is not specified whether the student should choose in high school or vocational school. In addition to this, Uniori has been developed specifically for basic education and the development of the high school is still in its infancy. For these reasons, it is reasonable for the new service model to be based on completed parts of Uniori.

LUT has also other activities under LUT Junior University. The LUMA Centre Saimaa is a joint organization with Saimaa University of Applied Sciences. The LUMA Centre Saimaa is part of the LUMA Centre Finland, and it focuses more on leisure activities while promoting natural sciences and mathematics. LUT Junior University centralizes on

Lappeenranta but has activities also in Imatra and Lahti. (LUT University n.d.b) The thesis focuses on how LUT Junior University works with the city of Lappeenranta through the collaboration model Uniori, in addition to which the thesis also examines lightly how the operation has been processed into the hands of the first customer, the city of Imatra as the form of Imatra Junior University (henceforth Universoma).

1.3 Execution of the study

The thesis is executed as process writing based on literature review and research data from interviews. Both service design processes and education export activities are topics that have been researched more in recent years, which means more up-to-date and fresh information is available. Many of the sources in the literature review contain empirical data that are been utilized in this thesis as well. As the first two main chapters after the introduction focus on the literature review, those chapters are built before conducting the empirical research but also reinforced with theories needed due to subsequent findings. Figure 2 shows in a way how the research process has progressed and it visualizes Fine's (1981, pp. 8-10, cited in Ojasalo 1999, pp. 35) thoughts of the reasoning process: *"a two-way movement from partial, fragmentary, and often confused facts to an idea and then back again to facts (not merely the original facts but also new particulars) -- With each circuit, the original facts and the inferred ideas are strengthened into premises and, in turn, into final beliefs or conclusions."*

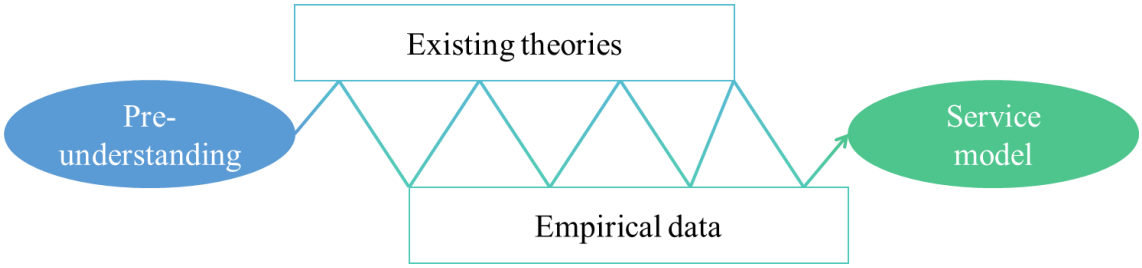

Figure 2 Visualization of the research process (adapted from Ojasalo 1999)

It is possible to build chapter *Service design* itself before the actual research, but it is reasonable to form chapter *Education export* together alongside the research, as the research data complements that chapter considerably more than the previous one.

Empirical research is based on the educational environment with a very strong focus on basic education through the form of interviews. In interviews, it is important to gather the interviewees' own experiences of both successfully implemented processes and thought-provoking challenges. Because of this, the semi-structured interviews are conducted both from individual and small group interviews – both of which are supported by their own strengths as interview methods.

1.4 Structure of the report

Input and output model is one way for visualizing the structure of the report, which is shown in Figure 3. The left parcel describes the input for the chapter which is then generated to the output of the chapter. This output knowledge is then utilized in the later chapters.

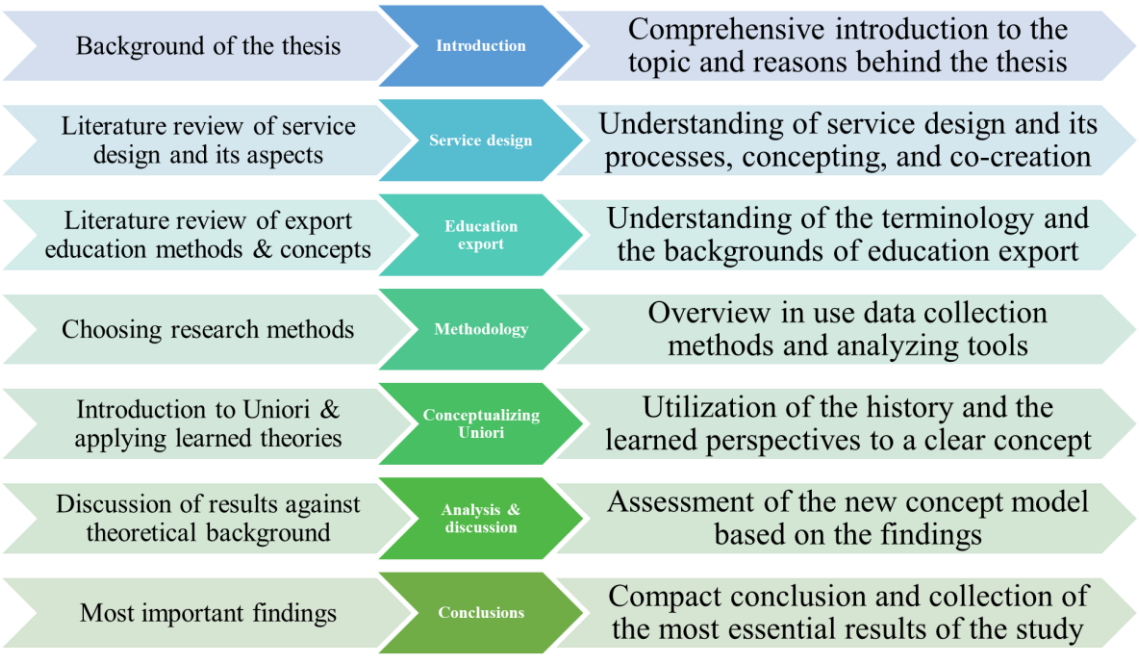

Figure 3 Input and output model of the thesis

The first chapter (*Introduction*) introduces the topic for the reader and clarifies the motive behind the topic. The second (*Service design*) and the third (*Education export*) chapters are performed as a literature review from versatile academic publications, books, and other sources. After these chapters, the reader understands the theories and studies which

form the basis for the research. Chapter 4 (*Methodology*) is an overview of the research and data collection methods for the applied research. Chapter 5 (*Conceptualizing Uniori*) unites the collected theories and the research data, and Uniori's concept model is reviewed. These results are then discussed and analyzed further in chapter 6 (*Analysis and discussion*) where a new service model based on Uniori will also be reviewed. Finally, conclusions and the most important aspects of the research are collected in the seventh chapter (*Conclusions*).

2 SERVICE DESIGN

One definition for a **product** is that it is either tangible or intangible output: either a good or service (Vargo & Lusch 2008). In this thesis, the final product is a service model. As the term **service** is commonly used for describing an intangible product, it does not correctly describe the final product this thesis is delivering. One other view for describing service is from Foglieni, Villari & Maffei (2018, pp. 6): *"If we search for the word service in any dictionary, the first definition reads, 'the action of helping or doing work for someone' or similar.*" Textbook example directs more to helping someone with their problem or performing things for someone. A closer look at the service business reveals various descriptions of the word service that do not directly correspond to the general concepts. In Table 2 is collected four distinct descriptions of the term service which are direct quotations from the reference materials. The rightmost column contains terms that are repeated in at least two quotations. From these, we can see that not every definition contains a 'customer' perspective. Based on these excerpt examples, the term service could mean *'activities with customers through a process'*.

Table 2 Definitions for 'service'

Reference	Citation for the term service	Similarities
Tekes 2010	Activity or combination of activities carried out by a service provider interactively with a customer to fulfil a need of the ladder.	Activities Customer
Vargo & Lusch 2008b	The singular term, "service," which reflects the process of doing something beneficial for and in conjunction with some entity, rather than units of output—immaterial goods—as implied by the plural "services."	Goods Process
Grönroos 2000, pp. 46	A service is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.	Customer Goods Physical Process
Zeithaml et al. 1985, cited in Foglieni et al. 2018, pp. 6	Intangibility, because services are activities or performances rather than physical objects and there is no transfer of possession when they are sold; Heterogeneity, because every performance is unique since it depends on the behavior of the provider and the customer, and of other contextual aspects characterizing their interaction; Inseparability of consumption and production; Perishability or inability to inventory. *(IHIP paradigm)*	Activities Customer Physical

From these descriptions, Foglieni et al. (2018, pp. 6) did not want to define the term precisely but guide people to understand service business and develop better services, as a result, they did not create their own description on the subject. While looking at the service from the perspective of **service design**, they brought in a description that combines the perception of many authors on the subject. Other reference descriptions are compiled in Table 3 with similarities on the rightmost column. All these quotations included 'experience' although not everyone had the term 'user'. From these excerpt examples, we could assume that service design means *'a holistic interactive user-centered innovation process'*.

Table 3 Definitions for 'service design'

Reference	Citation for the term service	Similarities
Mager 2008, cited in Steen 2011	The process of planning and organizing people, infrastructure, communication and material components of a service, with the goal of improving the service's quality, the interactions between a provider and its customers, and the customers' experiences.	Interaction Process
Ostrom et al. 2010, pp. 17, cited in Trischler & Scott 2016	Service design as 'the orchestration of clues, places, processes, and interactions that together create holistic service experiences for customers, clients, employees, business partners, or citizens'. This definition emphasizes two central aspects, namely a user-centered design and service systems aspect of service design.	Holistic Interaction Process User-centered
*Tuulaniemi 2011, pp. 10-11**	Service design is a systematic way to approach services development and innovation simultaneously, both analytically and intuitively. An analytical approach refers to information related to a logical chain of reasoning, facts, customer research, and data. Intuitive means the skill and experience to see what might be possible in the future; seeing what does not yet exist. *(*original text is in Finnish)*	Innovation
Foglieni et al. 2018, pp. 30	Service design is a holistic, user-centered approach focused on the relation between provider and user; The service user is at the center of the experience over time, i.e. before, during and after the effective use of the service; The user experience is made available by actors, processes and activities provided by or connected to the service provider; The application of service design competencies within an organization can result in solutions that bring increased user satisfaction, more compelling brands, and the acceleration of new ideas to market, establishing improved or new processes for service creation and development that more effectively support innovation.	Holistic Innovation Process User-centered

2.1 General view and examples

As we can see from previous tables, the content of the terms varies. This can easily lead to confusion, which is why different authors have started working on common terminology. An international network for studying service design was created in 2004; research on the subject has begun more widely after the 2010s and new programs have been added to university offerings in different countries. The research does not only include manufacturing and technology fields but also more traditional service fields such as health services, banking, and education. As people's needs and desires shift faster than organizations' offerings and impacts, it is very important to research service design from current aspects. In this way, companies can respond to altering customer expectations and ensure customer satisfaction, even though every customer cannot be satisfied similarly, but the general idea remains the same. (Foglieni et al. 2018, pp. 17-18, 21; Grönroos 2000, pp. 315; Komulainen, Kokkonen & Ojanen 2020; Oertzen et al. 2018)

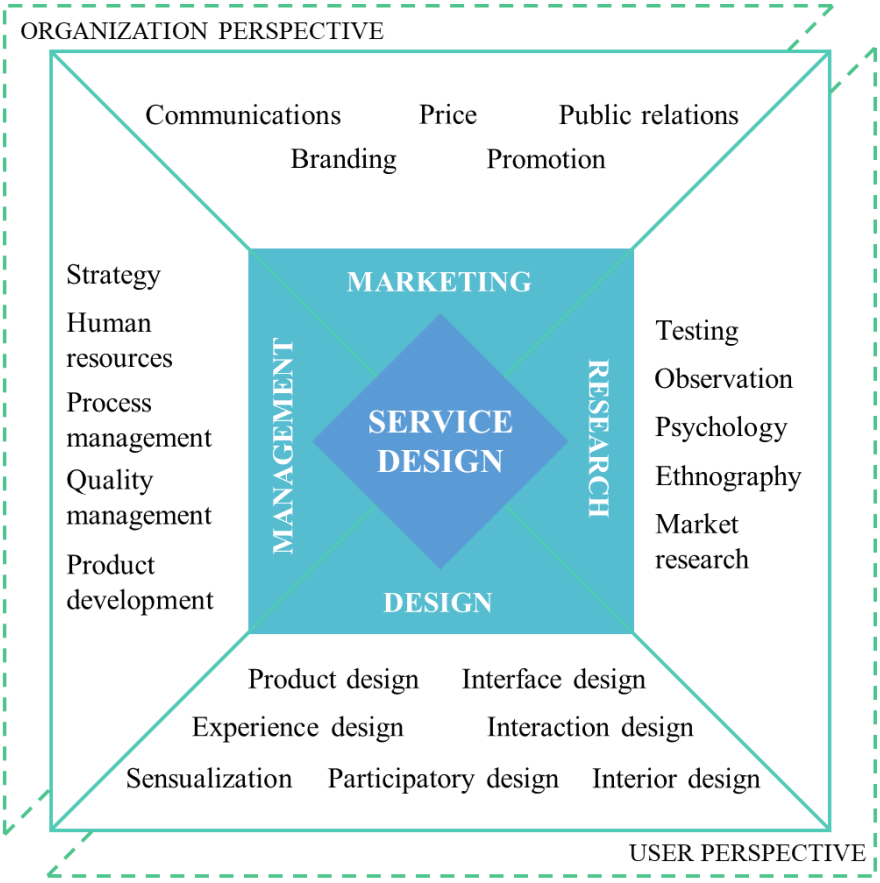

Figure 4 Multidimensionality of service design (Moritz 2005, adapted in Foglieni et al. 2018, pp. 17)

One example Foglieni et al. (2018, pp. 16-17) gathered for visualizing service design is shown in Figure 4 from multiple scholars. Service design consists of several areas from which management and marketing are divided under organization perspective, while design and research are under user perspective. As 'innovation' was mentioned earlier in Table 3, another way for visualizing service design is through service innovation shown in Figure 5.

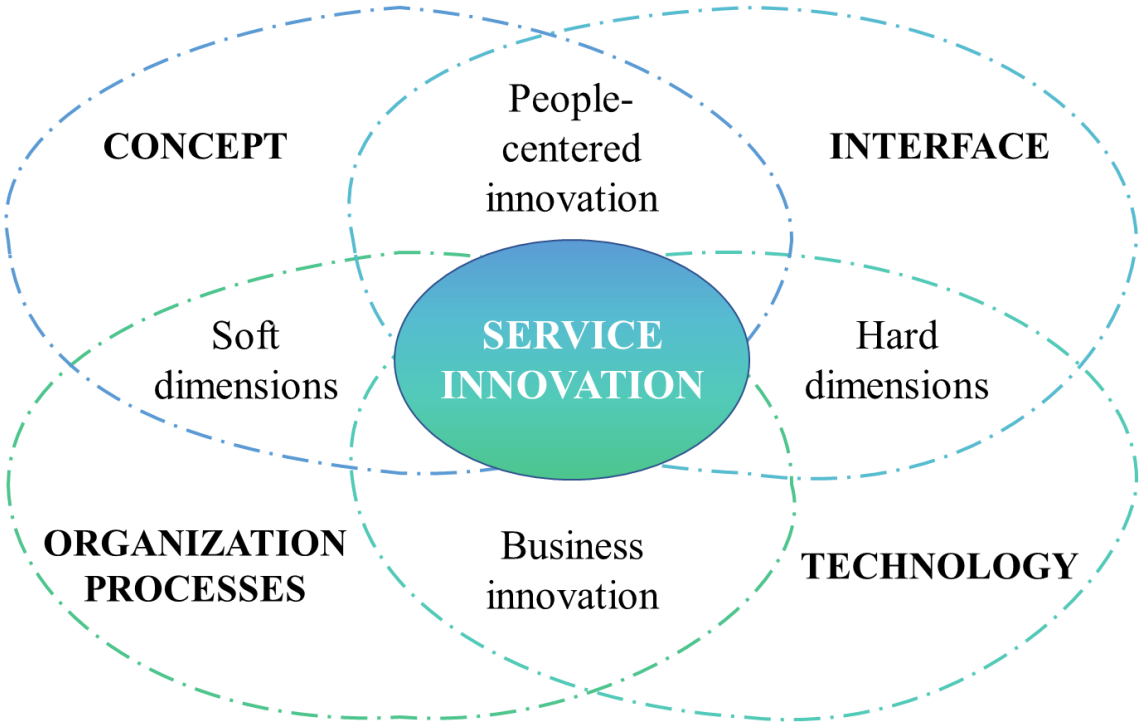

Figure 5 Aspects of service innovation (adapted from Foglieni et al. 2018, pp. 16)

Service design extends beyond just designing service as Foglieni et al. (2018, pp. 15) have put it: *"providing a new or a renewed offering to suppliers or customers, producing benefits for the provider organization, defining new business models, and designing new ways of interaction or valuable customer experiences."* Enquist, Edvardsson and Sebhatu (2007) agreed in their study that focusing on service innovation from a holistic perspective results in much higher quality services than focusing only on technical implementations.

Service is no longer necessarily its own sub-area but is increasingly being integrated directly into the product's life cycle. Services create and add value to the product as well

as the brand image as e.g., Apple and Nike have successfully done. Because of this, it is increasingly important to be able to design and develop services more than just a product-service perspective and move focus on solution businesses such as productized services. Research often aims to this: by developing different tools and techniques, it is easier for organizations to develop their activities further and it is easier for people at different levels to work together. (Foglieni et al. 2018, pp. 18-21; Komulainen et al. 2020; Tekes 2010)

Nowadays, technological development has brought both opportunities and challenges. Through advanced information technology and e.g., social media, new ways of working and developing services have emerged. Their downsides, such as personal privacy, are issues that need to be addressed and taken into account. Communication between people leaves a surprising amount of room for interpretation, causing misunderstandings and feelings of frustration between participants. However, particularly in the public sector, collaborative processes have gained popularity, making service design more citizen-centric. (Foglieni et al. 2018, pp. 21) In this context, it is also good to understand the public sector, public services, and their activities. According to Syversten (1999), public organizations and institutions are consisting of people who pursue a common goal and as a result, public services often strive for an effective equitable outcome. In the era of openness and to support the previous claim, Foglieni et al. (2018, pp. 21) point out a very important matter:

> *"Open and participative legislative processes, community-based initiatives and user-oriented performances constitute the core of efficient and effective public and private organizations."*

Table 4 Benefits and challenges of service design (adapted from Komulainen et al. 2020)

Benefits	Challenges
Benefits for customer	Service design as a concept
- Customer needs as starting point for planning - Deeper customer understanding - Facilitates in understanding the service entity - Active gathering of customer insight	- Obscurity of the concept - Internal disagreements in company - Different viewpoints of customer and company - Obscure benefits of service design
Improved communication and management	Resource and management challenges
- Visualization of a service helps in 'speaking the same language' - Internal collision in companies: forming of professional teams - Customer viewpoint is discussed more in service projects - Management and structuration service entities	- Challenging in pricing - Increased costs - Management of time schedule - Benefits are not experienced to be sufficient in relation to used time - Changes in thinking models: instead of traditional engineering, ideas should be launched in early phase
Financial benefits	Personnel and customers
- Increases in revenue - Early identification of good/bad development ideas - New business areas	- External service designer's insufficient knowhow on company's business area - Own personnel don't have experience on service design - Customers can get bored with excessive participation - Recognition of benefits from customers' viewpoint - Resistance for changes

Komulainen et al. (2020) identified in their research the benefits and challenges of service design as seen in Table 4. Service design helps to gather more systematic customer understanding as a key element of the company operations, however, customer-oriented approaches should not be taken for granted but rather integrate into the daily managing and monitoring (Komulainen et al. 2020).

2.2 Value creation and sustainability

When a company offers a product to its customers, it offers a value proposition. The service has no value until the customer defines it, because value creation takes place in the customer experience as the service generates a unique experience for every unique customer. As a result, the value of the service may vary from the original proposition. The value proposition can be modified to meet customer needs better, but then the

customer must participate in the process. In this way, changing customer needs can be met and thus the process benefits both parties while the end result is mutually satisfying. This is the basis for the service-centered view as it is always consumer-centric. The company builds relationships with its customers during this process and therefore the service-centered view is also relational, compared to the traditional goods-based view where the company and the customer are seen separated. (Tekes 2010; Vargo & Lusch 2004; 2008a; 2008b)

Value promises for products and services play their part in the customer's reflection on their buying behavior and related choices but nowadays the value promises of the company have risen to a critical role. Values such as nature and the environment have increased their interest, and this is partly reflected in the business of companies. Today, sustainability is seen as a combination of the ecological and business environment, which reflects ethics and responsibility thinking. Values-based services combine quality with sustainability aspects altogether. (Enquist et al. 2007) Based on the findings of their research, Enquist et al. (2007) formed a values-based service quality model for a sustainable service business as seen in Figure 6.

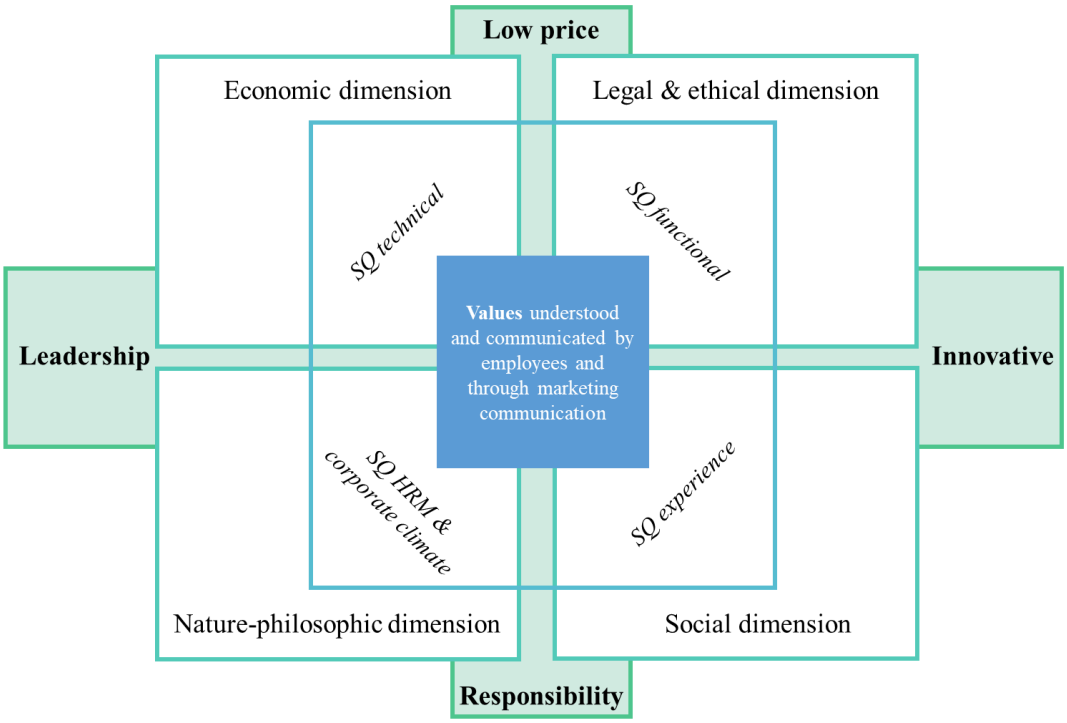

Figure 6 Values-based service quality for a sustainable service business (adapted from Enquist et al. 2007)

By adopting new sustainable values and by communicating them, the company can build a positive brand image, but this is not enough, the values must be integrated into the corporate culture to achieve the comprehensive advantage. In this way, when the customer shares the company's values, the value proposition of the service is also emphasized differently. However, it must be remembered that different values in different industries can be seen differently and they may affect the buying behavior differently. The values can also damage the brand image, as e.g. environmental violations are seen in a more negative light depending on the industry. If we look at the activities of universities, for example, sustainability must be constantly researched and brought in the public, to develop a more sustainable society. (Enquist et al. 2007; Sasson 2018) This is well summed up by Sasson (2018):

> *"Collaboration with school districts, state departments of education and other key institutions is needed to leverage the community. Universities should be the hub of professional learning networks, instrumental in shaping scholarly and effective professional learning."*

2.3 Service design processes

Service production results a service and it is an interactive process that has been under research and various scholars have been suggesting their representations of the different phases (Foglieni et al. 2018, pp. 31; Tekes 2010). There are a lot of similarities but also differences between process diagrams. As service design is not unambiguously phased, Figure 7 contains a compilation of different interpretations of the topic from commercial sources. The first step model (Belyh 2019) describes service design as an eight-step process, interpretation is made by an *"AI-driven jobboard"* site as a web article. The second model (LEAD n.d.) describes again a step process, this time only with five steps which includes the own training areas of this *"innovation partner"* site. The third model (Bradshaw 2019) is from a blog text written by a senior user experience designer from a digital agency, and it describes only four steps leaving for example the testing from the previous example out. The fourth and last model (Design Council 2015) is from *"an*

independent charity and the government's advisor on design" and it is a double diamond model.

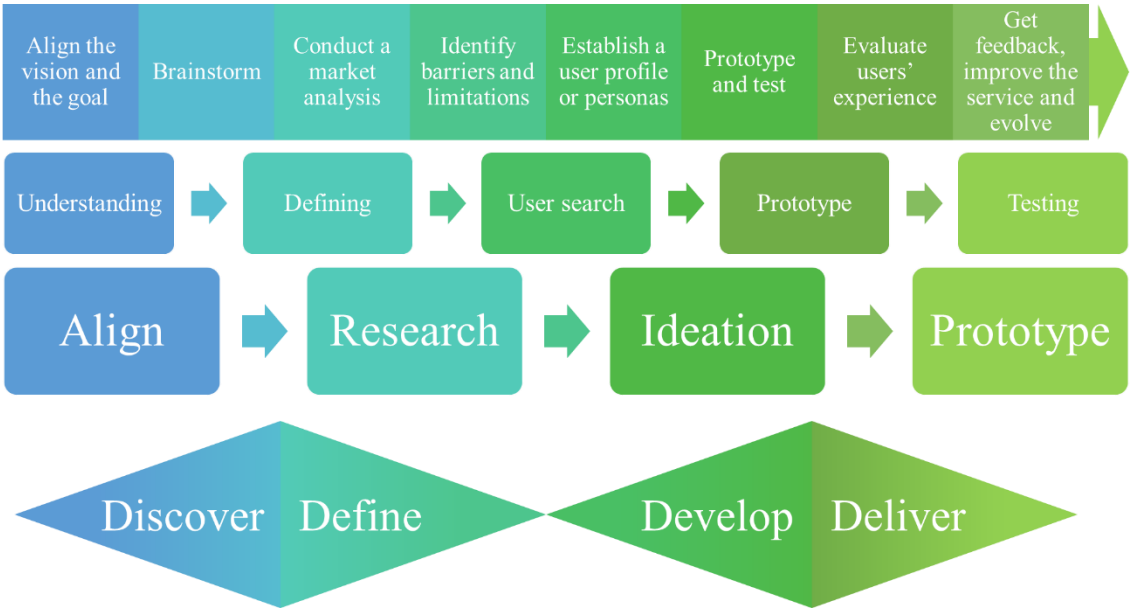

Figure 7 Phases of service design by commercial sources (Belyh 20019; Bradshaw 2019; Design Council 2015; LEAD n.d.)

Based on the study by Foglieni et al. (2018, pp. 31-33), it is common for commercial sources, like service design agencies, to visualize their step or phase model. Because agencies often come to the same conclusion as Vargo and Lusch (2004; 2008a; 2008b) about that service design is a customer-centric process, these processes also aim for this. The end result of the process is not just to create new ideas on how to do something better, but to aim at systems and platforms that benefit the organization as well as the customer. Although the service design process could be used for different processes within the company, it has still a service-oriented target. In their studies, Foglieni et al. (2018) noticed also differences and similarities between different models, so they suggested the development of a unified model such as in Figure 8.

Figure 8 Towards a common vision of service design (adapted from Foglieni et al. 2018, pp. 33)

Although the study of Foglieni et al. (2018) focused on different commercial sources than this thesis, it is good to note how close their process model is compared to Design Council's model. Both models follow creative problem solving, with the emphasis on divergence and convergence model (Tuulaniemi 2011, pp. 113). This model can also be called a diamond model due to the shape of the model. It should also be noted that in all these processes mentioned and visualized, the steps begin and end but have no actual interaction other than at the interface of the previous and the next step, unlike the loop model in Figure 9 where the same process is performed multiple times until the end result is refined close enough to what is desired.

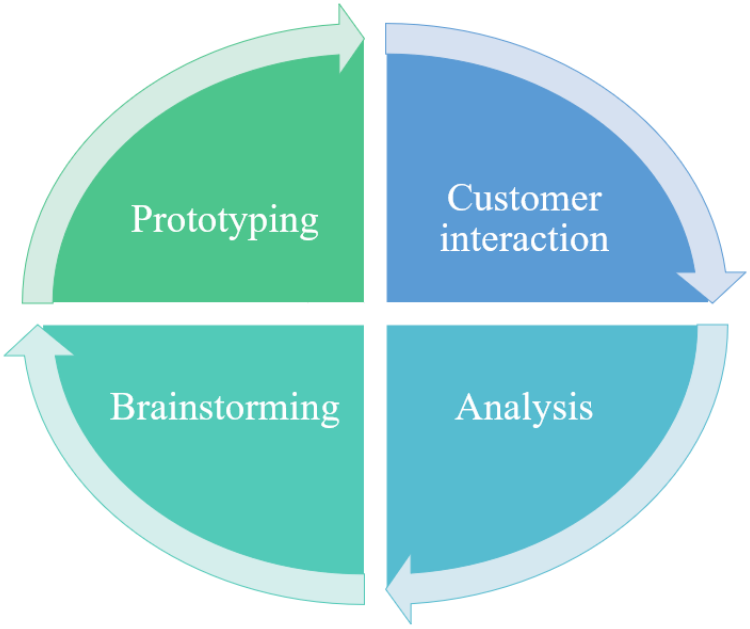

Figure 9 Phases of service design (Widmark & Patel 2013, s. 74-75; adapted in Komulainen 2018)

Tuulaniemi (2011, pp. 99, 112-115), on the other hand, has emphasized both iterative and incremental process: the process yields partial outputs along the processes, and by using repetitions they are ground towards the final output. The iterative cycle consists of 'development – result – evaluation – analysis – development'. In service design, it is worth focusing on the design of the entire service ecosystem to control the overall picture, and not providing the customer with a service that includes non-value-adding features. (Tuulaniemi 2011, pp. 99, 112-115) The entire service design process is described in Figure 10.

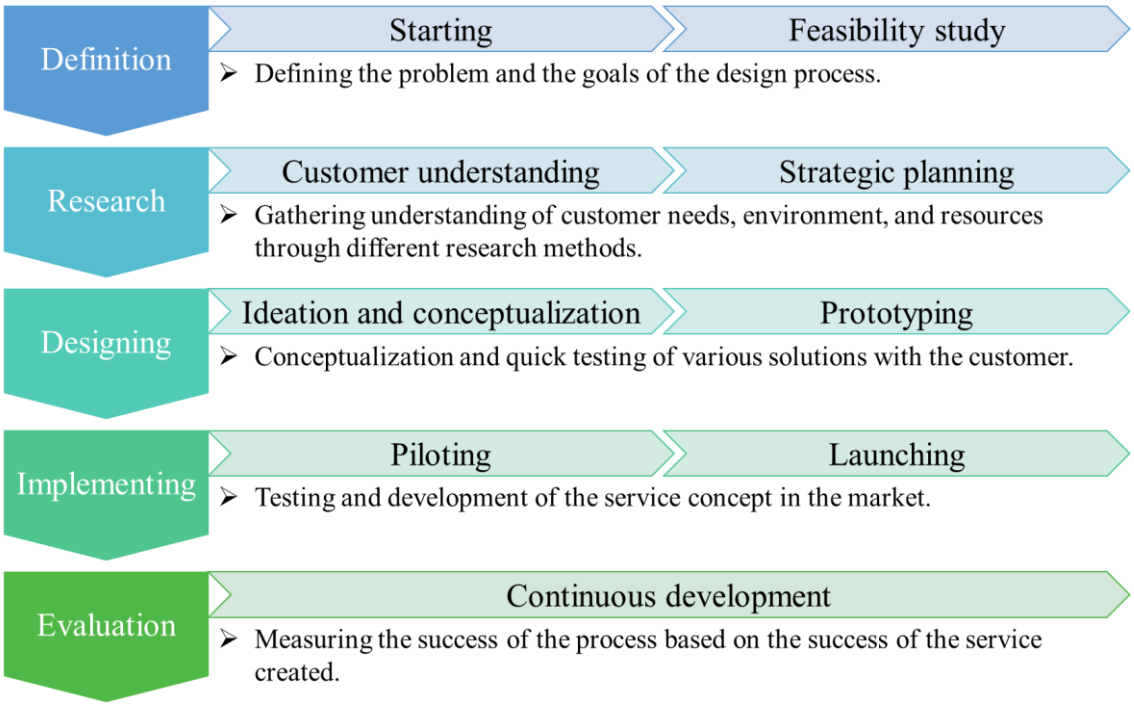

Figure 10 Iterative and incremental design process (adapted from Tuulaniemi 2011, pp. 130-131)

Definition and research phases gather knowledge about the project and help to model the service. Actual solutions are designed in phases from strategic planning to launching while specification and implementation of the service focus on phases from prototyping to continuous development. (Tuulaniemi 2011, pp. 130-131) From all the process diagrams discussed, this contains more than the others, which is partly also a reference material-dependent matter. It should be noted, however, that Tuulaniemi (2011, pp. 126) advocates the fact that there are many different models, some of the models resemble their authors, and that process models apply to different situations and projects.

Because service is an intangible product, it is produced and consumed at the same time. This leads to the fact that no matter how well the customer needs are considered, it is difficult to know for sure how well the service works in the end. Because of this, the iterative approach helps in this situation as well. The iterative approach helps to identify crucial moments in consumption, those moments that can lead to success or failure. By fine-tuning the solution towards the final, the service can be optimized closer to what is desired. (Tuulaniemi 2011, pp. 115-116) This is an important thing to consider when designing the final output, as the scope of the thesis only takes into account the

functionalities of the beginning of the design process. However according to Tuulaniemi (2011, pp. 116), when visualization and prototyping are done from the earliest point possible, the testing of the concept happens. This thesis visualizes the early-stage concepts to facilitate further work on the topic.

As a conclusion from all the different process alternatives, it can be stated that the research of this thesis is located at the beginning of the process, in Tuulaniemi's model to the definition and research phases. However, perceiving the overall picture of the process is beneficial when the service design process proceeds further, and the service model is being worked towards the final. The process alone, however, does not lead towards goals, but it is important to utilize different service design methods as part of the process steps as they can help seeing things from a different perspective (Komulainen et al. 2020).

2.4 Concepting and co-creation

Service concept can be defined as: *"description of a service idea and the principle to be followed in the production of a service product"* and it should include *"a revenue model as well as an idea of the most central properties of the service, the value created by the service for a customer, and the resources needed to produce the service"* (Tekes 2010). As the importance of value and its origin was pointed out earlier, it is good to define the possible value proposition already in the concept of the service, otherwise, the perception of the service becomes dim, which complicates many aspects in the process.

Based on the study by Grönroos (2000, pp. 111, 165, 170-171, 192-193), concepting is seen as problem-oriented and that the creation of a service concept should be customer-oriented and should guide the service design process. The concept describes the company's intentions of which customers' problem the company is trying to solve and what are the means for solving it with the service. The concept also includes how different parts of the service support or facilitate the aim of the service, with what resources, and how customers are integrated into the development process. Goldstein et al. (2002) have a similar view:

> *"However, unlike a product, service components are often not physical entities, but rather are a combination of processes, people skills, and materials that must be appropriately integrated to result in the 'planned' or 'designed' service. -- The service concept not only defines the how and the what of service design, but also ensures integration between the how and the what."*

The concept serves as a good interface and integration tool between the company and the customer, between the intends and the needs. It is important for cooperation and communication that the concept is clearly understood, and people have a shared perspective for working on the common goal. A clear concept serves as a solid foundation for the service design process and makes it possible to clarify strategic choices related to the service or the benefits it brings, and it helps the decision-making. (Goldstein et al. 2002) As mentioned earlier and noticed in these three examples, the terminology varies depending on the author. One representation about co-creation of services conceptualizations and the major aspects are collected in Table 5.

Table 5 Explanation of the seven themes in co-creation of services conceptualizations (Oertzen et al. 2018)

Theme	Explanation
Customer-provider emphasis	The conceptualization focuses on the collaborative act between the customer and the service provider and does not specifically name other actors.
Multi-actor emphasis	The conceptualization focuses specifically on more actors than just the customer and the service provider.
Emphasis on resource integration	The concept of resource integration is mentioned within the conceptualization.
Emphasis on joint creation	Co-creating services occurs on a joint interface through a collaborative act.
Emphasis on customer creation	Co-creating services occurs on the customer's side throughout the customer's own actions and implicates less direct collaboration with the service provider.
Entire service process	Co-creating services takes place during the entire service process, denoting all phases such as co-ideation, co-valuation, co-design, co-testing, co-launching, co-production and co-consumption of a service.
Selected phases of the service process	The conceptualization specifically mentions co-creating services taking place in a particular phase of the service process, for instance in the co-design or co-consumption phase

According to Tuulaniemi (2011, pp. 116-118, 129), co-development is usually the key principle of service design. It is not only the customers who should be extensively involved in the entire service design process, as the service includes other user groups

too. All parties involved in the development process should be supported, as they will be engaged both in the development of the service and in the production of the service. Instead, Oertzen et al. (2018) considered a larger view of the partner network, beyond development:

> *"In services, co-creation manifests itself in different forms depending on the phases of the service process (co-ideation, co-valuation, co-design, co-test, co-launch, co-production and co-consumption) and is influenced by a contextual, multi-actor network."*

Regardless of whether it is a development phase or a whole process, supporting the people involved for thinking like designers is important because then their creativity and more unusual ideas will stand out better. Because the value of the service is determined by the end-user, it is important to specifically consider their needs, even when the motives of other parties play an important role. However, customers do not always know what they actually want and their wishes can shift during the process. (Foglieni et al. 2018, pp. 21; Komulainen et al. 2020; Tuulaniemi 2011, pp. 116-118, 129)

It must be remembered that public and private companies are different and have different operation modes. Users of public services are not just passive consumers; their needs and desires also matter if a service is designed to create value. Service design plays an important part when created value matters to both parties, an organization and a customer. It has been noticed how important the role of participatory users is when developing a public service system, as many opportunities come available. (Kuure 2014; Trischler & Scott 2016)

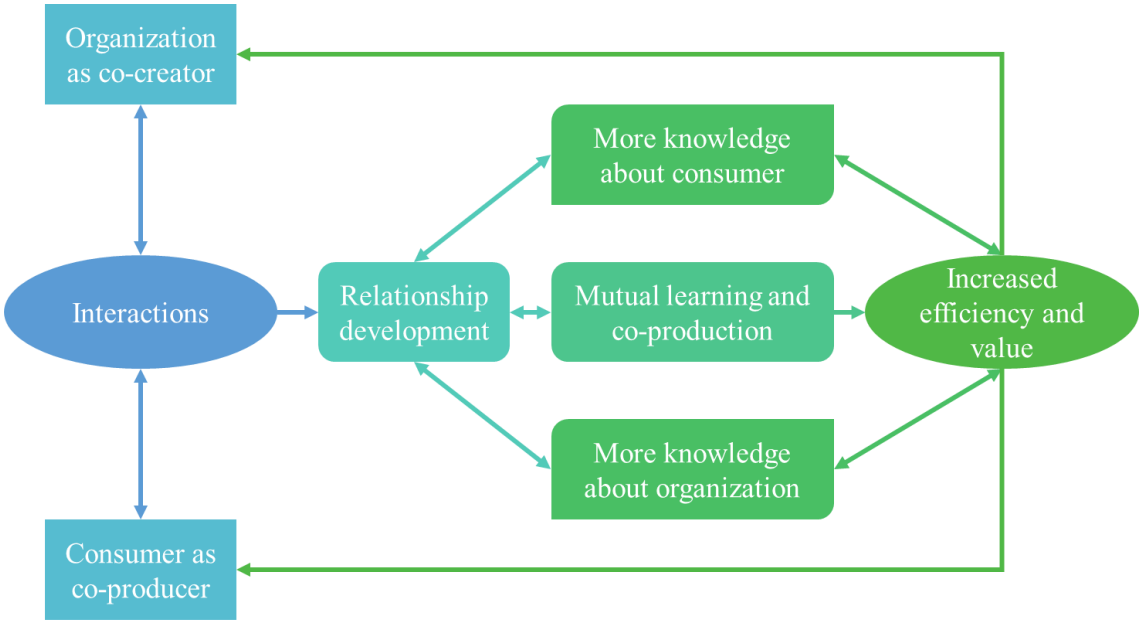

Figure 11 Co-production in public services (adapted from Trischler & Scott 2016)

Co-production interactions are described in Figure 11. An organization is seen as a co-creator whereas a consumer is seen as a co-producer. The organization creates value for the consumer and the consumer produces value for the organization. Through interactions, the relationship between parties develops further. While the organization gains more knowledge about the consumer and vice versa, mutual learning and co-production take place. This leads to increased efficiency and value due to interactions between all aspects. A more simplified perspective of enhanced productivity is seen in Figure 12 where the customer is seen as input resource and as co-producer (Ojasalo 1999, pp. 90).

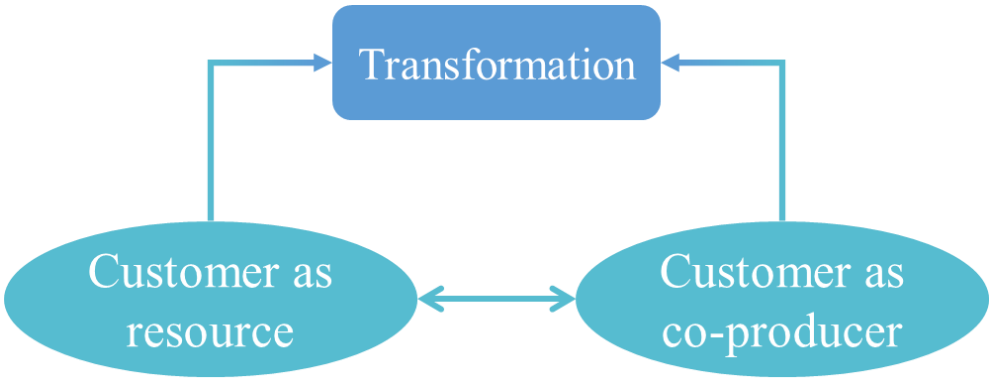

Figure 12 Transformation value-creating conversion activities (Lengnick Hall 1996, pp. 797, adapted in Ojasalo 1999, pp. 90)

As said, co-creation with the help of co-production by the customer's side can increase efficiency and productivity. This could lead to increased productivity but there are other aspects too. One option is through standardized services which are not easy to implement, but by modularizing, services can still be customized yet in a more effective way. In contrast to this, highly customized solutions require more integration of different techniques and resources. Resource integration can also be beneficial, but it has its challenges on personal, social, or e.g. economic levels. However, co-creation of services is the recommended course of action from many perspectives for the service industry, such as improved customer loyalty. Those companies that are aware of the benefits of co-design may not consciously aim for realistic goals that are important to the company's strategy. To avoid diminished benefits, a company needs to validate project-specific goals and concepts. (Komulainen et al. 2020; Morelli 2009; Oertzen et al. 2018; Steen, Manschot & De Koning 2011)

One way to take advantage of co-creation is to create ideas through children, as they generate plenty of innovative ideas that many adults would not even be able to imagine. This requires action-oriented workshops to make it easier for children to form visual concepts or otherwise construct ideas into a form that is easier to understand. Depending on the co-creator method and customer base and age, different benefits can be categorized as in Table 6, noting that they focus only on the co-design process and not on improved services and their benefits, which would be much more comprehensive list. (Morelli 2009; Steen et al. 2011)

Table 6 Benefits of co-design for project, customer, and organization (Steen et al. 2011)

Service design project	Service's customers	Organization(s)
- Improved creative process - Develop better service definitions - Organize more efficiently - Develop better customer understanding - Improve customers' loyalty	- Services better match the needs - Higher quality services	- Foster creativity throughout the organization - Develop capabilities to innovate - Promote out-of-the-box creativity - Promote communication and cooperation

In addition to these, a deeper review of the literature yields more results, as the benefits have been explored together with the process. The benefits are often long-lasting and do not necessarily focus solely on the business-customer interaction but go beyond these boundaries. The co-design process, like any process, has its risks and costs that must be evaluated in the possible implementation and decision-making of the process. The best result is achieved by considering various aspects of the risks to the objectives, selecting the most appropriate methods for both the company and the customer side, and implementing them most appropriate way and time frame. (Steen et al. 2011)

3 EDUCATION EXPORT

What is the term for taking education activities and culture of one country to another country? Firstly, searches suggest education export, but what does it include, and how transnational education (TNE) associates with it? Education export does not have a standard meaning although its popularity is growing in interest and various countries and institutions are expanding their international operations towards transnational education activities. As the main exporter countries in 2016 were Australia, Canada, England, New Zealand, and the USA, education export was seen as commercially exporting higher education (Hughes 2008; Schatz 2016). One description of the term is by Adams (2007, cited in Schatz 2016):

> *"An educational service approach based on a public-private partnership with market-driven services that may provide a surplus to the institution, high quality educational and pastoral services to students, and export income to the nation, within a strong regulatory framework."*

There has been little literature on implementing education export, and only after 2005 did transnational education and related topics began to appear in publications. In other countries, there were less than seven publishers, but in Australia, the topic was more published: in the leading education exporter country, even 29 separate authors published on the topic by 2014. Most of the research focused on the following topics: globalization, policy, quality, trade, and student experience. After these did topics such as teaching, learning, regulation, partnership, and governance come up on the list. (Juusola & Räihä 2018; O'Mahony 2014) Teaching and learning have been studied as such, so it is quite understandable that those topics did not directly get to the top of the list. However, when thinking about the matter more closely, it seems peculiar that it is these topics that would be of interest to researchers, as the topics are the center of the service in question.

Based on the survey research executed by O'Mahony (2014), Figure 13 visualizes how many different ways people describe TNE. As seen in the figure, 11 out of 21 different phrases include some kind of word for collaboration or partnership. This could indicate

that people see TNE as a two-way street which is the case. Other terms are more variant, with the top three focusing on ‘international’, ‘program’ and ‘education’.

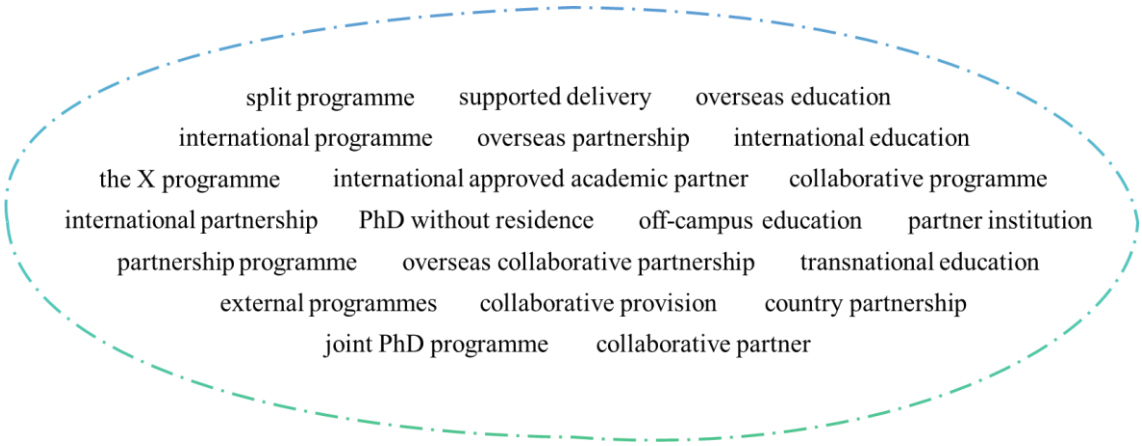

Figure 13 Phrases to describe transnational education (adapted from O'Mahony 2014)

The survey was answered by a group of people working in universities with TNE activities. Every person did not participate in TNE activities by work-related tasks and based on the survey results by O’Mahony (2014), it is clear that universities require more effective communication about TNE activities. This does not only include the exporting university, as noticed earlier, literature and research regarding different education exportation activities are growing but not there yet. When the topic is relatively new to the field, communication can fail, and people may misunderstand which activities they are related to.

This issue of terminology between the exporting university and the recipient (or host) university was also noticed in the study of Knight (2016). Despite this, the study found that TNE is a quite known term because it is used in a common language but can add confusion among non-English speakers, and according to Knight:

> *“It has come to mean the movement of academic programs and providers between countries and tries to distinguish itself from international education which focuses more on the movement of students.”*

The term can include twinning programs or international branch campuses, joint, and multiple degree programs, co-founding and/or co-developing collaboration between multiple institutions, and when speaking more independent forms, franchising universities, or distance programs. When comparing these two categories (more general forms and more independent forms), it must be taken into account how, for example, the local legal system affects operations. (Knight 2016) With most of these examples, the terminology includes only cooperation between universities, and not e.g., an exporter university and a recipient primary school. However, the study points out that TNE is the movement of teaching and programs, which can be implemented to other levels of education too.

Finland has not been on the top of the list of education export countries and one reason lies in politics. In recent years, different acts and regulations have made new opportunities possible. In 2010, Finland got its first education export strategy (Schatz 2016) and in 2016 it was finally possible to set tuition fees for exchange students (Juusola & Räihä 2018). With these changes, Finland's regulative and monetary framework grew stronger and more commercialized.

One of Finland's strengths in education export is Finland's international reputation for established and outstanding PISA results. The Programme for International Student Assessment (PISA) measures thousands of students every year from OECD member countries. The students are tested at the age of 15, and the PISA study focuses on measuring students 'ability to absorb knowledge, attitudes toward learning new things, ability to solve problems and to apply what they have learned in the future. The main emphasis of the PISA study varies from cycle to cycle, and these main emphases are literacy, natural sciences, and mathematics. Finland excels in these main emphases but especially in literacy. (Ministry of Education and Culture n.d.; Schatz 2016; Ustun & Eryilmaz) Although various solutions have been made for the development of international education, and although Finland is one of the leading countries in education, the country is still lagging in terms of export activities.

3.1 Challenges and obstacles

Different countries are at different stages, have different motives, and different level strategies towards transnational education and internationalization. This is reflected e.g. in smaller OECD countries or larger developing countries as a way to add new and better educational options for their limited scope. Although internationalization is seen as an important area for development, language is an obstacle in many countries, as English native countries have linguistic advantages over other countries. As mentioned earlier, the research on TNE is mainly published in native English-speaking countries which are at the forefront of development also. Integrating language studies into other education is one of the challenges, as the common language must be taken into account not only in teaching but also in all instructions and materials, both for teachers and students, in written and spoken. This complicates how to view and improve quality if it is not known how quality is seen in that culture. (Bovill, Jordan & Watters 2015; Hughes 2008; Knight 2016)

Different cultures have a wide range of varying aspects. One problem with cultures colliding is that some can see their own culture as superior which can reflect as appearing privileged complacency. Culture can be a defense mechanism for avoiding new things such as pedagogical approaches, but this is not always the case as culture cannot explain everything, but it can have influence over anything. One thing to consider here is cultural divergence: learning is seen and experienced differently in various cultures, which contributes to teaching and its chosen forms. Cultural changes in learning take time when they have not been involved and evolved since the earliest stages. However, learning and teaching are not an integral part of the culture, making them more flexible to modify. There is still research on how well students in another country can adapt to a different teaching culture of another. It is also important to remember that different cultures are formed socially which has an impact on power relations. This can include relations between a teacher and a student. Culture can be used as exploitation, one's own culture can be used as an excuse: the delay in the meeting could be due to religion, even if it were not true. Because of this, it is good to keep in mind cultural differences as well as individual differences. (Bovill et al. 2015; Hughes 2008; O'Mahony 2014)

Quality is also perceived differently in other cultures, regardless of whether it is a linguistic competence or the quality of teaching and learning. This is also conveyed through the interpretation of skills, as another culture may value creativity and problem-solving skills higher than the collection and application of knowledge. This is reflected in the teaching staff. As education export grows its popularity, the effects are also visible in recruitment: new specialists who have experience or prerequisites to participate in education export activities are needed. When looking at teachers, participation in international export activities can be reflected in teachers' willingness to develop themselves and think about it from a career perspective for participation can be seen as positive career development. (Hughes 2008; Juusola & Räihä 2018; O'Mahony 2014)

3.2 Possible solutions

Various solutions to meet the challenges have been proposed, focusing on cooperation between universities. It is possible to use some of the examples in other cooperation options and models too, consequently it is good to present them to further use. Practices to boost Finnish education export were collected in the study by Schatz (2016). The major categories were national coordination and funding. According to those respondents, tuition fees, legislation, and national cooperation would be the route to better education export. According to Bovill et al. (2015), the suggestions on the other hand are:

> *"(1) practicing what we preach: modeling particular pedagogies and practices; (2) ensuring reciprocity and mutual benefit; (3) ensuring individual integrity and institutional credibility; and (4) developing and supporting transnational staff."*

Based on the study by Juusola and Räihä (2018), the three most important aspects which need more attention when developing education export activities were identified. The first point was to ensure a flexible and encouraging work environment for the teachers involved in these processes. As mentioned earlier, culture and language can be obstacles. That is why the second step is that teachers need professional support for overcoming these obstacles. The third and last aspect is that teachers should get exact boundaries of

when and what they are teaching in their home country or city compared to exporting one. (Juusola & Räihä 2018)

These three points are more detailed, while the study by O'Mahony (2014) summed up recommendations a little more broadly. The study also encouraged supporting staff but instead of the well-being of teachers, at the center is supporting both with transnational teaching context as well as cultural and social awareness. Teaching should be designed according to the constraints of the recipient country and also, teaching and learning are seen as individual values which should be noted. In addition to this, transnational education should be valued, and its importance should be visible to others. Cross-national collaboration with education research is also encouraged, also with those who are not leading export countries and with including the recipient countries. It is important that relations between countries are cherished and that experience is shared between different partners. (O'Mahony 2014) When comparing these sets of recommendations, it is clear how accurate and definite the other points are and how other points directly towards the development of the topic in general.

In general, it is important to have clear goals and guidelines, which can be understood with weaker language skills when exporting to different language zones. It is also important to consider common expectations and prejudices as part of the formation of the partnership. Here again, communication plays an important role in avoiding misunderstandings. As not all representatives of the parties can be involved in the whole process, it is important to communicate as clearly as possible so that neither party misunderstands when information passes through several people. One solution is to involve the recipient school and develop a common strategy with them, including the communication methods and strategies. The most important factors that are required to be clear are goals or objectives, whether or not they are common, or that they only affect the other party. International education has many long-term benefits in the development of both curriculum content and teaching methods, so it is good to solve various problems at an early stage and maintain the benefits. (Bovill et al. 2015; Hughes 2008; Knight 2016; Schatz 2016)

Even if the organization focuses and succeeds on internal affairs inside the institute and with the partners, the competitive position still needs to be considered. According to the survey by Schatz (2016), one respondent voiced how competitive international operations are in Finland and how each institution tries to cope on its own while competing with the same market areas. The situation is comparable to the fact that in the corporate world, every company strives to survive and prosper through its competitive strategy. A company can focus on product development, which means that its product offering becomes better than its competitors'. A company can compete on price and thus influence its competitors with low prices. The company can also invest in the customer experience, in which case relevant experiences create greater value for customers than the product would only by itself. (Löytänä & Kortesuo 2011, pp. 22-23) The organization must therefore create a suitable position for itself in the competitive situation and consider the competitive strategy as part of the education export strategy.

3.3 Example models

The research has sought to find models similar to Uniori model presented in this thesis. The starting point for the work was the idea that Uniori would be unique globally, as the basic idea was to implement an unprecedented model. As a result, the author sought to search the literature for publications that exhibited the same or in some way similar features as Uniori. Next, the different models and their offerings are presented, and later on the similarities and differences compared to Uniori. The texts of the models are mainly from the sources mentioned, so the sources are referred to mainly at the beginning of the paragraph. The first model is the closest to Uniori. Sasson (2018) studied a model called Galilium with the main focus on organizational structures. This is noticeable as the framework is addressed from that perspective, but other important areas were also found in the study. Kantola and Kettunen (2012) studied a university partner service of the Turku University of Applied Sciences where collaboration and education export activities take place on a higher level of education. Keay, May and O'Mahony (2014) studied the Communities of practice framework and how to implement it in the educational environment in general.

3.3.1 University-community partnership Galilium, by Sasson 2018

Sasson (2018) studied a multi-organizational regional partnership called Galilium which has been formed between fifteen municipalities and other partners in Israel, serving 100 communities, 220 000 people, and 50 000 children. The main goal of this community is to increase local education and interest in the field of science, technology, engineering, and mathematics (STEM). As in Finland, the challenge in Israel is to get young people interested in studying science at the university level, and with skilled local people and equal opportunities, the goal is achieved for future generations. Galilium is a form of cooperation involving many different partners with the same goals and shared resources, and together they have formed a multi-campus model for contributing to the development of the region, as it is one of the common motives shared with the partners.

Primary stakeholders:

- 15 municipalities
- 5 academic institutions
- 3 science research institutions
- Several local companies
- The Ministry of Education
- The primary educational systems (preschool to secondary school)

Multi-campus model:

- 3 academic science centers
- 5 STEM hubs (each with different focus area)

The research topic focused specifically on the organizational perspective of the collaboration network, and as we can see from the lists above, this is a large regional cluster with multiple actors with multiple outcome modes or locations. However, the study found that the role of academia is significant as they lead and develop activities tremendously. In addition to innovative teaching methods, the academic side enables various important contacts in terms of operations. In addition to this, the core partners play a key role and other partners work collaboratively through them. When looking at how it is possible to deal with all the components (core and collaborative partners and multi-campus model) in everyday life, it is good to look at Table 7 for the different working groups and their structures. In addition to the forms, a Public advisory committee

of experts in science and education for academic and industry have been a subject of discussion, but it has not been established yet. Also, the Regional forum of education department directors has been under discussion as it lacks the participation of the director of Galilium.

Table 7 Regional network of Galilium framework (Sasson 2018)

Regional network part	Led by	Meetings
Executive committee - Academic institute CEOs and CFOs - Cluster CEO - Chair and director of Galilium	Director of Galilium	2-3 times a year
Lead team - Directors of academic science centers - Regional pedagogy coordinator - Regional administrative coordinator	Director of Galilium	Weekly
Regional science program coordinators forum	Pedagogy coordinator	Triweekly
Regional STEM hubs directors forum	Director of Galilium	Monthly
Regional STEM research project representatives forum	Project coordinator	Monthly
Regional forum for permanent staff of academic science centers	Director of Galilium	Bimonthly

Galilium seizes the opportunity to bring the real problems of everyday life closer to students and their education, by making learning more meaningful especially with technical school subjects with the help of academic and industrial professionals. This and many other benefits can be summarized as a citation from Sasson:

> *"Partners can leverage financial, human and material supports for mutual benefit. Specifically, institutions of higher education can support kindergarten, elementary and secondary school efforts to promote STEM studies, collaborate on problem-based learning challenges, and offer academic support and lab facilities. Industries can provide students with work experience, illustrations of real-world applications of cross-curricular integration, and material resources including space and equipment. Both partners can provide curriculum development support and professional development support for both teachers and students."*

The aim is to build a sustainable and permanent platform that empowers regional success via a wide range of local partnerships overcoming the physical geographic distances.

Sasson's qualitative research found four distinguished themes of the goals and how to achieve them, which are visualized in Figure 14.

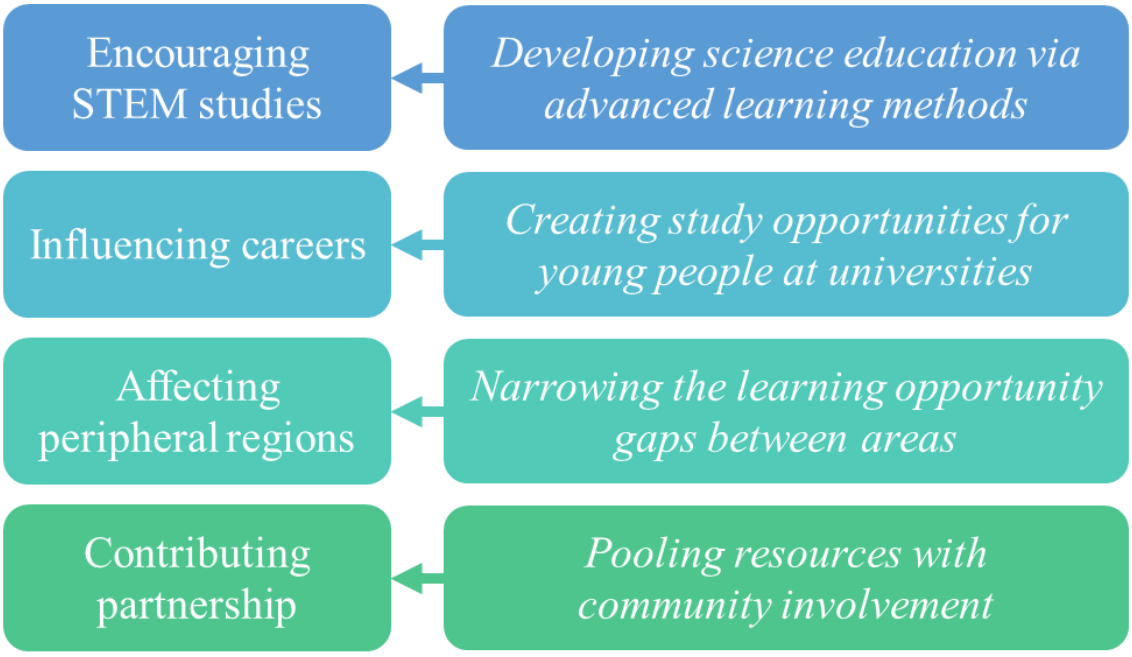

Figure 14 Main goals and measures of Galilium (Sasson 2018)

While at this point, many goals have been common and shared, some organizations have their emphasis on different agendas which have been seen as a minor challenge. All partners identified mutual respect as the main factor towards shared partnership although communicational factors between different organizations and different levels of decision making have been challenging. One possible solution which has already been created is digitalized shared knowledge platform that enables common learning guidelines and materials. Regardless of the solutions already made, it is important to constantly identify potential barriers

3.3.2 TUAS service model, by Kantola & Kettunen 2012

Kantola and Kettunen (2012) studied the practices and methods of a Finnish higher education institute Turku University of Applied Sciences (TUAS), creating an operating model for educational export activities based on their research. The study focused on combining innovation pedagogy with research and development activities. In practice,

this means a multidisciplinary learning environment, which has also been introduced in the new curricula of higher education. Innovation pedagogy can facilitate the uptake of knowledge and improve students' ability to apply what they have learned. TUAS has been successful measured by research, development, and innovation (RDI) as highlighted here from the research:

> *"In a way, TUAS was also the most significant Finnish exporter of education in the sector through the EU project finance mechanism. Nationally, the networked projects of UASes have been functioned as the links between the learning of individuals, organisation and region and the interactive partnership between the individuals have been one of the central dimensions of the activities of these higher education institutions."*

TUAS has successfully integrated and combined networking, RDI, and learning all together. The process started from the obligations of the Finnish parliament and the lack of funding from the European Union. The situation was solved with the integration of RDI activities with the basic curriculum of TUAS students. Through this, the TUAS research was extended to new areas and new international partnerships were created, with which information on teaching methods was shared, giving education export its current form. In addition to knowledge, basic curriculum courses have been piloted, and it has been found that there are other options for education export such as services or concepts. Regardless of the form, integration remains an important part together with collaboration and interaction with different partners.

Based on the research, the service design approach of a university partner service was introduced. The service strengthens the interaction between regional companies and universities of applied sciences as visualized in Figure 15.

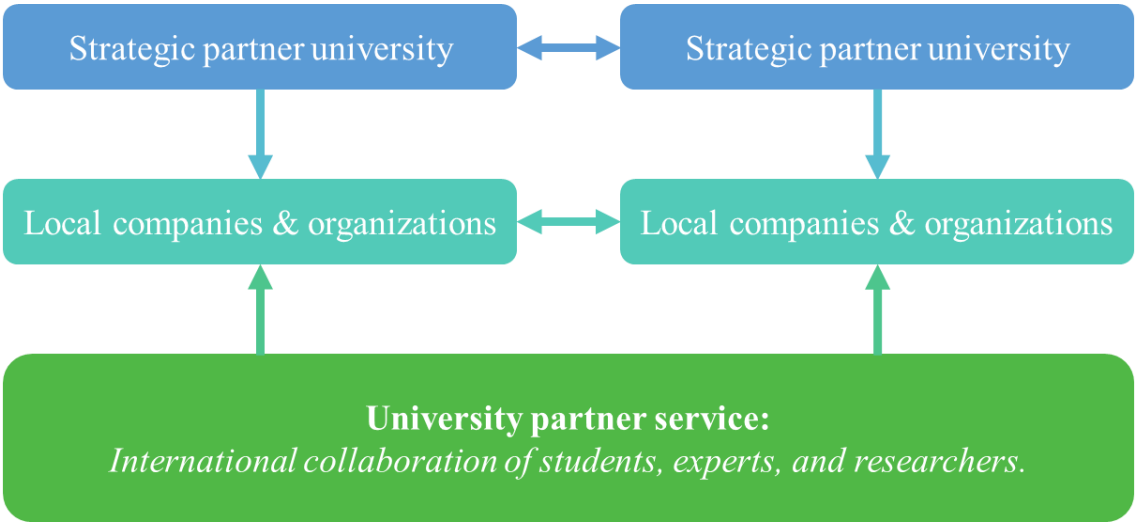

Figure 15 Framework of university partner service (Kantola & Kettunen 2012)

The possible interactions and relationships can be formed with a simple collaboration model which benefits the partners in several matters. Such actions have been made possible by various means, which are largely based on six main elements of the model:

- Multi-field operation
- Applied research and development
- Student learning in applied research and development projects
- Flexible curricula
- Entrepreneurship
- Internationalization

3.3.3 Communities of practice in TNE, by Keay et al. 2014

In the paper of Wenger-Trayner and Wenger-Trayner (2015), the term communities of practice is described as: "*Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly*." The domain, the community, and the practice form the basis for this theory. **The domain** is the shared interest for something. All the members of the domain are committed to the domain, but they do not always work with each other. **The community** can be for example a tribe, a youth gang, a band of artists, an institution, or a group of engineers working on the same assignment. They all pursue the same interest, which makes them interact and learn together with the help of each other. **The practice** comes

from the members of the community building a shared knowledge base, a knowledge repertoire, where they share their practice with other members, self-conscious or not. (Sasson 2018; Wenger-Trayner & Wenger-Trayner 2015)

One of the examples mentioned is education. As said, communities of practice focus on learning together. However, learning is not just the exclusive right of education, and there it is mainly the end product rather than the process. In education, learning through development guides action and direction toward the desired domain. Effective learning and teaching take time and is relatively different from e.g. learning done at the enterprise level. However, this approach is recommended to be explored and used e.g. as part of international development. (Wenger-Trayner & Wenger-Trayner 2015)

Keay et al. (2014) studied transnational education from the perspective of communities of practice. Joint enterprise functions as a domain, so all staff and students engaging in TNE program belong to the domain although the most important factor is the input and commitment that comes from the teachers. As a result, the greatest threats are seen as challenges in flexibility, especially in the curriculum, and the expertise of the teachers and other staff joint to TNE activities. The main key factor is seen in finding the right staff, creating a quality curriculum, and effectively integrating the two together.

Mutual engagement, by the community, is emphasized in TNE activities as it is a form of collaboration between partners seeking mutual interest. As a result, communication plays an important role in ensuring high-quality results and a minimum number of errors. Sharing information and knowledge with every level improves the effectiveness and it is seen as helpful and mutually shared learning especially among the students. However, communication and information sharing are not used in all areas, as highlighted in the study, local knowledge and expertise are usually not utilized or even considered.

Lastly, the practice can be identified as a shared repertoire that highlights the lack of engaging all partners and make use of their skills, resources, and competencies, as the previous quote also emphasized. Sharing experiences is a key part of the process as it facilitates learning and development. Despite this, the study noted how little

implementation of the process remained in the recipient countries and how the focus was on education as the end product. Better allocation of time or other operational approaches could help the commitment of the community to the domain, but many actions take time and are sustained over time. However, many factors are such that they cannot be defined in advance as part of a cooperation or partnership agreement.

4 METHODOLOGY

In the study of Trischler and Scott (2016), one approach for examining the way information can be gathered in public service systems was introduced. Their approach was also implemented in their study with university students, so their review was not left to the literature alone. Consideration of this approach may be useful because, in the case of Uniori, the subject of the study is a public service (primary education) combined with a university operator. The approach of Trischler and Scott includes three steps: use of personas, application of visualization, and use of observation. Because a company cannot meet the needs of all potential customers, they must be divided into distinct groups from which a target group can be chosen for further analysis. The use of personas is an alternative method for target group analysis, it includes observing differences in learning (and teaching) and should be complemented with in-depth interviews. It is possible to use only observing methods, but via interviews, a wider overview is achieved. Application of visualization can be implemented by using different mapping tools, for example in collaborative workshops, while identifying critical touchpoints of the customer journey. The use of observation should also be complemented with in-depth interviews, while the main idea is analyzing the touchpoints found in the previous step. After this method has been utilized and the full background of the customer has been understood, the results are then discussed and analyzed. An important part of service design is to understand the customer journey. (Grönroos 2000, pp. 315; Trischler & Scott 2016)

Foglieni et al. (2018, pp. 33) advocated quantitative data collection at the start of service design data gathering. The observation of behavioral patterns provides an insight into the current state of the customers. This information should be complemented by qualitative data from human observation. Different tools should be used in gathering information, and in visualizing and analyzing the actual data while keeping in mind the benefits of visuality in both. Unlike Trischler and Scott, this theory utilizes the creation of personas in the analysis phase and not in the research phase. Other tools mentioned are *"user archetypes that gather characteristics, behaviors, and attitudes of people observed"*. Conceptual maps and service blueprints are also recommended. (Foglieni et al. 2018, pp. 33-36)

Both methods emphasized using different visualization techniques as part of the process. Tuulaniemi (2011, pp. 115) speaks in favor of visualization, as it presents information in a new, more easily assimilated way that concretizes the matter under development more strongly. In the case of prototypes, visualization gives all parties a clearer and manageable image of the product or service, which creates a common understanding more quickly and thus speeds up the process itself. According to Kuure (2014), a service prototype can be a tool for learning and communication but also an inexpensive practice for testing service applications in real-life scenarios.

With these approaches, it can be possible to get a deep understanding of teachers' and students' experience of Uniori. Because this research study provides only preliminary data on the research subject, broad-based methods are not used as such. Also, the current global pandemic situation is causing its own limitations, so e.g., observation or workshops, cannot be exploited for this study at the time and the focus is on in-depth interviews.

4.1 Background of the interviews

Data and information were collected in the form of interviews. A total of 25 people were invited, 19 of whom participated. The persons invited to the interviews were selected on the principle that people from different fields of Uniori activities would be involved, some of whom had experience from the beginning of the activities and some of whom had joined only at a later stage. The demographic factors of the interviewees were not asked or determined in more detail, but based on the overview of the interviewer, there were both younger and older men and women.

A total of 14 interviews were conducted. Thirteen of the interviewees worked in teaching positions in Lappeenranta pre and primary education (principals and head of teaching included), two worked in other city positions of Lappeenranta, three were staff members of LUT and one respondent included was from the city of Imatra, as they were the first "customer" of Uniori model, in the form of Universoma model. The interviews ranged in length from about half an hour to an hour, depending on the backgrounds of the

interviewees and the number of participants in the interview. Table 8 describes the job-related background information of the interviewees.

Table 8 Backgrounds of the interviewees

Organization	Position (current or past)	Interviewees
City of Lappeenranta	- Head of teaching - Business/strategic coordinator - Principal - Deputy principal - Teacher	1 2 1 1 10
LUT	- Coordinator - Head of study services	2 1
City of Imatra	- Head of teaching	1

The interviews included single and group interviews, resulting in either a one-person independent experience or a shared experience by multiple people at a time, depending on how well the individuals were able to share their experiences in each other's presence and how much supplementation they received from the others. Larger group interviews were initially sought because of the shared experience and the amount of data to be collected, but due to the fragmented schedule of the interviewees, the interviews were often divided into smaller groups and pairs. Certain individuals wanted to be interviewed on an individual basis, due to their unique background or role in Uniori's operations.

Interviewees were invited via email and interviews were conducted via Microsoft Teams with video and audio. The interviews followed a semi-structured model to facilitate the structuring of the topic and the initiation of the discussion. The key idea, however, was to gather the interviewees' experiences of the stages of Uniori's ideation, piloting, and implementation, as well as the finest successes and the most important areas for development. With the permission of all the interviewees, audio from the interviews was recorded for transcribing to facilitate the study. Interviewees were numbered to facilitate anonymization of the study and review of results. Anonymization was the basis for the study so that interviewees were better able to share their personal experiences. The experience-based interview was chosen on the basis so that the interviewee can bring his or her own expertise, his or her own input to how the interview progresses and what questions arise.

4.2 Structure of the interviews

As noted, the backgrounds of the interviewees differed, so although efforts were made to keep the interviews as comparable as possible, certain themes and topics had to be addressed only with certain individuals. Because of this, the semi-structured interviews focused mainly on the following four topics:

1) First impression and motivation
2) Challenges
3) Successes
4) Experiences of others (teachers, students, parents)

The aim was to gather as much information, lived experience, and thoughts as possible on these topics with the limited time frame. First impression and motivation serve as important starting points for any activity, so here also they played an important role. Challenges also play a very central role, as the aspects learned from challenges work as a basis for developing the model further. Challenges and successes teach in their ways and bring their own perspective to the topic. In addition, the experiences of other teachers, feedback from parents, and the impact on students were sought to be addressed as part of the whole, although the interviews were based specifically on the interviewers' own experiences, so that experiences of others are still seen through the interviewee's own eyes. In addition to those four main topics, the interviews also covered some of the following topics depending on the interviewees:

1) How the interviewee joined Uniori activities
2) How Uniori's operations got started
3) Special features of different grade levels
4) Curriculum relevance
5) Cooperation between different partners

The first of these five questions acted as an opening question in the interviews, aiming to recall the past of the interviewees, as 83 percent of the interviewees had been involved

since the first year and 17 percent of the interviewees had been involved later (Imatra excluded). In addition, the aim was to find out the origins of the activities for those who had been involved from the beginning. Especially in the teacher interviews, the specific features of the different grade levels were also clarified, aspects which have been or which should be taken into account in the activities. Also, the relevance of the curriculum was discussed in some interviews, especially with regard to decision-makers of the activities. Finally, cooperation between different actors was explored, focusing on the patterns of co-operation between LUT University, different companies, and the schools and the city, especially regarding the initial phase of operations. Some of the questions were clearly reviewed one at a time, in some situations the interviewees themselves provided answers to different topics based on other questions raised in the interview.

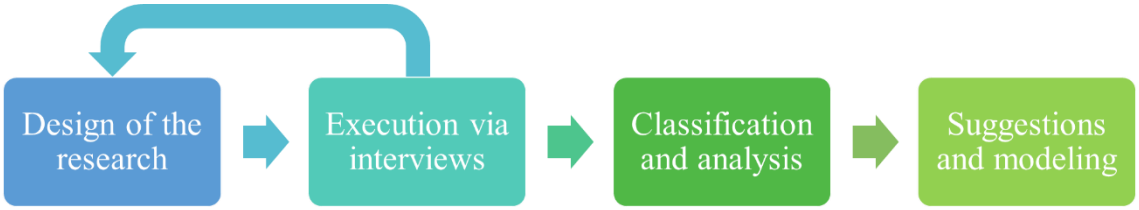

Figure 16 Phases of the methodology

As seen in Figure 16, the interview process can be divided into four phases. The first phase included everything about designing how the research was conducted. As this was the first interview research conducted by the author, the author became acquainted with different interview methods from which the most suitable one for the research was selected. The topics and possible questions were sought to be created as far as possible for the interviews in order to make the interviews as uniform as possible in terms of the method. However, this was not entirely successful, as can be deduced from the arrow backing up from the second phase, as the questions and boundaries had to be modified as the interviews progressed. This was since the interviewer's knowledge of the topic increased with the interviews so that supplementary questions could be formed.

After the execution of the research, the data was classified and analyzed. First, the transcripts of the interviews were manually compiled in MS Word into four groups based on the interviewees' background: the city, the teachers and principals, LUT staff, and

Imatra. Within these groups, the transcripts of the interviews were then divided thematically into different categories, aiming at the four main topics (first impression, challenges, successes, experience of others). For example, interviewees were asked directly what kind of challenges they have experienced over the years, but this was not always answered directly, so information was extracted from other parts of the interview which served as a complementary source in other situations as well. The interviews were examined on a group-by-group basis, i.e. the responses of all teachers and principals were viewed together, making it easier to compare responses within the group. In addition to this, the responses of all interviewees on certain themes were reviewed. Finally, based on the research, an overall picture of Uniori was formed, and together with the information obtained from the literature, a model was created for possible educational export activities of LUT.

5 CONCEPTUALIZING UNIORI

Over twenty years LUT has been developing collaboration with local schools. In 2017, this led to the launching of LUT Junior University, which includes all cooperation with children and young people. LUT Junior University already extends to collaboration with the cities of Lappeenranta, Imatra, and Lahti. LUT also started a new collaboration model with the city of Lappeenranta: Lappeenranta Junior University, also known as Uniori which is led by the city of Lappeenranta. With this new model, LUT started developing teaching in close cooperation with teachers, students and their parents, researchers of LUT, and local companies. Uniori reaches from preschool to upper secondary school. (LUT University n.d.b; LUT n.d.c; Uniori n.d.a)

LUT has won several awards for its Junior University activities, as the International Sustainable Campus Network award in 2020 (LUT-yliopisto 2020) and the International Green Gown Award from the category of Creating Impact (LUT University 2021). As this is a unique form of cooperation, it is reasonable to look at and study the concept it has grown into. As mentioned before, it is good to look at the idea behind the Uniori program and the principles on which Uniori concept is based. In addition to this, it is necessary to look at the various components that the current concept consists of, as well as the original problem, which was set to be resolved, what were the means, and what solution was reached. Based on this information, a comprehensive picture of Uniori can be constructed, and thereby means to develop it even further can be facilitated and the value can be determined.

5.1 Uniori briefly

Uniori started its activities officially in the academic year 2019-2020, preceded by design work which began in the academic year 2017-2018, and piloting which was conducted in the academic year 2018-2019. During the planning phase, two working groups of teachers led by a university coordinator met once a month to plan the content of the teaching. Piloting took place in one preschool, four primary schools, and two lower secondary schools. Teaching materials were then fine-tuned and teachers were trained, which led to

the official launch of the program. After two academic years of planning and piloting, the activities could begin with 400 preschoolers, 2100 school children, and 200 teachers. (Naukkarinen & Koikkalainen 2020) Uniori includes activities with early childhood education, primary education classes 3rd, 5th, and 8th, and upper secondary education via high school. The thesis focuses on all other areas but the upper secondary school which is waiting for a unified curriculum as it is still under development in Lappeenranta, and it is clearly a module of its own kind.

City of Lappeenranta's Committee for children and young people (*Lasten ja nuorten lautakunta*) has approved a local complementary curriculum (11.6.2019/§70), which enables activities of Uniori on primary education in Lappeenranta (Uniori n.d.b). With the local curriculum, every student of Lappeenranta has the same starting points and opportunities to participate in Uniori's activities. If Uniori's activities were similar to an afternoon club or leisure activity, not all students would be able to participate in the same way. Now students' background, interests, or willingness of their parents do not influence the decision to participate in learning new things. Uniori is in this way very unique concept.

In preschool, children are familiarized with the circular economy, energy, and water. These themes are implemented in the curriculum to learning topics *"I study and act in my environment"* (*Tutkin ja toimin ympäristössäni*) and *"I grow and develop"* (*Kasvan ja kehityn*). This means that preschoolers study the themes as part of their normal curriculum. Uniori also has two major collaborative partners; a waste disposal company Etelä-Karjalan Jätehuolto Oy and an energy company Lappeenrannan Energia, to help teaching and learning the themes built for preschoolers. (Peda.net n.d.)

In primary school, students participate in Uniori program every third grade and their themes are integrated into several subjects from environmental science to mathematics and physics. For every class, there are two options for studying Uniori's themes: a shorter and more compact package of 6 to 8 hours studies or a multidisciplinary package of 35 to 40 hours studies. Both packages include pre- and post-class assignments and homework. The schools can decide by themselves which package serves best for their teachers and

student groups. (Lappeenranta Junior University 2019) Figure 17 visualizes what topics are covered and which teaching subjects include those studies.

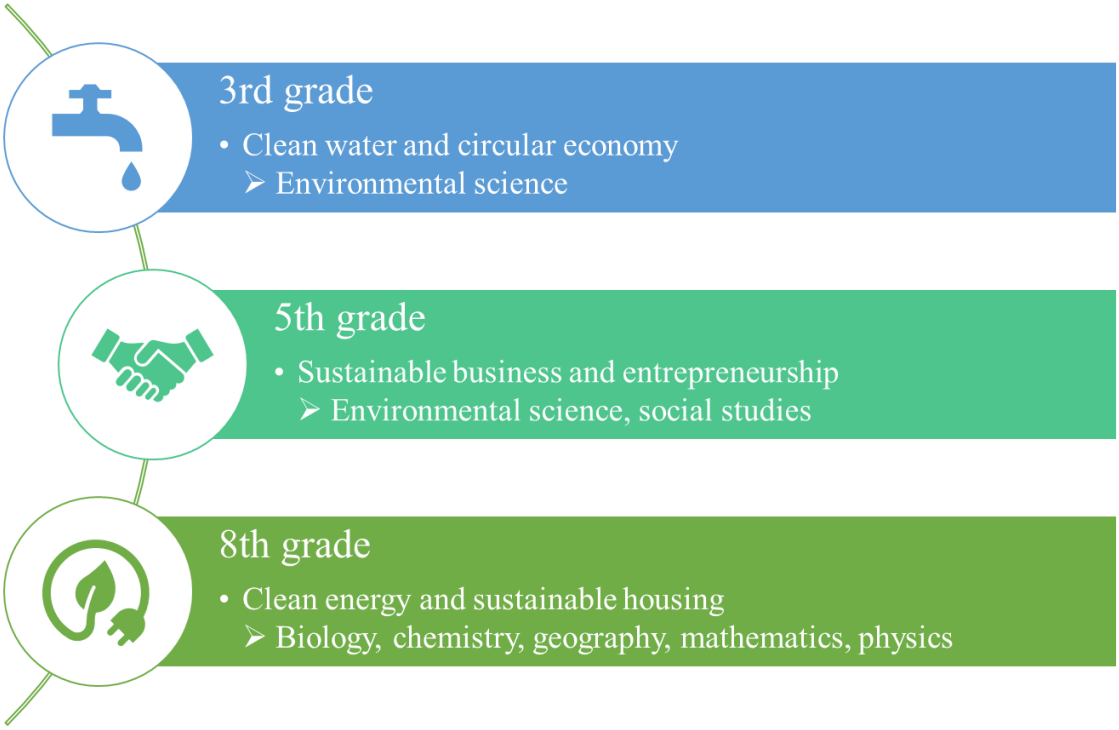

Figure 17 Primary education topics and subjects (adapted from Lappeenranta Junior University 2019)

In **third grade**, students learn about their water footprint and how they can influence their family's consumption. Students also familiarize themselves with the circular economy and how their actions impact nature and society. Lessons are expert-driven and include experimental learning. In **fifth grade**, students are encouraged towards the entrepreneurial way of thinking and how business can be implemented sustainably. Students also familiarize themselves with environmental responsibility and how the local economy works. Lessons focus on innovative product and service design learning. In **eighth grade**, students learn about their carbon footprint and how they can choose more sustainable consumption habits. Students also familiarize themselves with different energy forms. Contents of different subjects are thinking skills, computer science, towards a sustainable future, sustainable lifestyle, natural scientific research, physics in own life and society, electricity, and chemistry in own life and society. Lessons are built on problem-based team learning. (Lappeenranta Junior University 2019)

Figure 18 Sustainable development goals (LUT University n.d.a; United Nations n.d.)

When looking at the goals of Uniori, one can notice similarities with LUT's Trailblazer 2030 strategy. As Figure 1 in chapter 1.1 presented UN's sustainable development goals LUT has adopted to its action, those goals are presented again in Figure 18. Those with clear similarities to Uniori's content have been highlighted more. The third graders focus on the 6th goal, the eighth graders on the 7th goal, and them both to the 12th goal. All in all, Uniori activities are strongly tied to sustainable development, so different themes are reflected in Uniori's operations in different ways, some more clearly and prominently, some of the themes take shape more in the background.

5.2 Behind the concept

As constructed at the beginning of chapter 2, service means activities with customers through a process and service design is a holistic interactive user-centered innovation process. The university can be thought of as the provider organization and the city of Lappeenranta as the customer. These partners have been collaborating with each other for a few years in the design and innovation process and will continue to work with each other through a variety of activities. Vargo and Lusch (2004; 2008a; 2008b) described in their studies how services are relational and participatory from a service-centered view. LUT has developed Uniori in close cooperation with the city of Lappeenranta, and

mutually satisfying results have been met. In terms of the big picture, Uniori has been developed with one customer and is offered to other customers based on the experiences and customer needs found in Uniori program's design process. This has already been done, e.g. in the case of the city of Imatra where Uniori program has had the form of Imatra Junior University, Universoma.

Uniori is an innovation of its own, as no similar service has been implemented e.g. in Finland. Komulainen et al. (2020) mentioned in their study solution businesses and productized services, of which Uniori serves as an example. As Foglieni et al. (2018) described, an interface and concept are achieved through organizational processes and technology that are linked as a whole. Although technology plays a much smaller role when it comes to Uniori which was based on the right kind of resources and entity, it also plays a role in innovation, as the study of Enquist et al. (2007) supports the claim. The development of general innovations and technologies has been supporting the development work of Uniori and, as the study of Foglieni et al. (2018) emphasized, that these changes have increased the importance of cooperation in the public sector as well. New working methods and opportunities together with legislative changes have supported the development of the public sector, which can be seen in LUT's increased number of cooperation activities and the development of cooperation with different cities.

The study of Oertzen et al. (2018) presented seven themes in the co-creation of services conceptualizations, and in the case of Uniori, co-creation focuses on the entire service process from co-ideation and co-design all the way to co-production and co-consumption of the service. From the earliest moments of operations, the customer, the city of Lappeenranta, has been involved in the co-operation. As Tuulaniemi (2011) pointed out, in the case of Uniori as well, other parties have been involved in the development work also and their work has been supported like others, focusing not only on the relationship between LUT (the provider) and the city of Lappeenranta (the customer).

When looking at Uniori's service design process, one can think of an example adapted from Foglieni et al. (2018). The research phase focused on exploring what other models there are in the world are and how they work. At the define stage, as the name implies,

Uniori’s objectives, guidelines, and possible activities were defined. In the development phase, Uniori's various practices and activities such as workshops began to be developed. Validate phase was to pilot Uniori and launch it, in order to validate that the activities are on the right track. Finally, in the implementation phase, Uniori's operations were introduced in all schools in Lappeenranta.

Komulainen et al. (2020) summarized the various benefits of service design, a few of which are worth paying attention to from Uniori’s perspective. Although Uniori has clearly not been developed according to a specific process, some similarities can be observed, as seen in the previous example. From the perspective of the city, i.e. the schools, customer needs did not necessarily play the biggest role from the beginning. However, because the design of Uniori has been teacher-driven, there has been a clear customer insight and deeper customer understanding. Komulainen et al. (2020) also brought together different challenges. Overall, in terms of the main objectives, mutual viewpoints have been achieved, but there have been some differences in performance, such as working methods between schools or teachers, as the answer of one of the interviewees of this thesis shows:

> *“On the other hand, it was quite rewarding and it helped to be able to compare that part of the stuff we thought we were doing just fine, so they then said that they will not succeed in that. I think it brought a lot of inconvenience as well. And yes, there sometimes is that when you do this and we do this. We weren’t always exactly the same wavelength on something.”*

It did not appear more significant from either party that the time spent was too great in relation to the benefits and that the customer side did not appear to be bored with excessive participation but rather enjoy and eagerly participate. Nor has there been a clear objection for change, although to some extent it has provoked thoughts which are discussed in more detail in the next chapter.

Because Uniori has been created in close cooperation, the customer's values have been able to be taken into account along the course of the process. As the study of Kuure (2014)

pointed out, the consideration of public service customers plays a key role in view of the different possibilities of the service. However, both public and private sector customers are consumers of services, so they play a key role in their design. Above all, Uniori is a long-term partnership, in which case the needs of both parties mean, so it is good to involve the various parties in the discussion, as already have been noted and implemented. In this respect, the co-production in public services model adapted from Trischler and Scott (2016) reflects well the course of Uniori's co-development, relationships, and learned knowledge.

It is good to look at the models presented in chapter 3.3 from an in-depth comparison point of view in relation to the Uniori model and the new export model which is developed from it. The study by Sasson (2018) focused on the Israeli Galilium model, which is in wide-ranging activity, reaching up to 50,000 children regionally. Galilium has many features comparable to Uniori, and on the surface, it appears to be a large-scale version of Uniori model, almost as Uniori were extended to affect the entire province instead of only one city. Running such a large-scale activity, therefore, requires an extensive network of partnerships, of which Galilium serves as a functional example. Galilium's concentration on STEM subjects, i.e. in science, technology, engineering, and mathematics, are similar to those which can be observed in Uniori. Equal incentives for university studies also play a key role in supporting the coherence of the models. Like Uniori, Galilium is intended to build into a sustainable foundation for continuous operations, whereupon it is not a momentary project-type operating principle. The study does not focus on sustainable development themes, but curriculum development has been mentioned in the study, although the subject remains in a side role. Upon the interviews of this thesis, on the other hand, three out of twelve teachers and principals highlighted curriculum affiliation and how major it has been for Uniori’s activities.

The study of Kantola and Kettunen (2012) regarding the possibilities of the University of Turku of Applied Sciences at the local level were focusing on university students. Although the study focused on collaboration between young adult students and companies, the model is comparable to collaboration between primary education students, a university, and local companies. This model aims at innovative teaching methods and

extensive local collaboration between school and business, so students' impact on regional development is comparable to the development of a local skilled workforce like Uniori pursues. The model also has the advantages of international visibility and cooperation, encouraging entrepreneurship, and learning new skills from different project cases, and applying them in different fields. The latter point serves as a good starting point for all learning development work.

Communities of practice applied to education systems presented Keay et al. (2014), is a good framework idea and it was recommended for use in an international learning environment and development, although it is not a direct education export model. The right kind of curriculum and skilled staff are highlighted, and these two aspects have played a key role for Uniori. The importance of communication is one of the main aspects of this study as well and the importance of successful communication cannot be overemphasized. The sharing of experience and proven methods is also recommended, so in the case of Uniori it would be good to focus on sharing experiences in order to develop joint action and not leave the responsibility to individuals.

5.3 Motivation

In addition to the theoretical review, it is good to study more of the empirical data collected in the form of interviews. As the interviews were based on the experiences and feelings from the past and current, the data was mostly qualitative as such. Some of the answers were able to be categorized at a more general level and common opinions and themes could be found. Table 9 focuses on the first thoughts raised when hearing about Uniori and the personal motivation to start developing and implementing the activities. All twelve principals and teachers had something to say for this aspect of the interview, represented by *'of teachers'*. *'Of total'* stands for those and the representatives of the city or the head of teaching, Imatra included.

Table 9 Motivation and first thoughts about Uniori

Area	Topic	Of teachers	Of total
Uniori	Meaningful objectives (values) of Uniori	42 %	50 %
	Cooperation between different (education) sectors	42 %	44 %
Learning	Something new and fun for students	25 %	25 %
	Researching real-life phenomena	17 %	19 %
	Experientiality and functionality in teaching	17 %	19 %
	Lifelong learning	17 %	19 %
Work life	Professional development	58 %	50 %
	New contacts	42 %	31 %
	Enrichment of everyday work	33 %	25 %
Personal	Inspiration, enthusiasm	58 %	56 %
	Opportunity to make a difference or decisions	25 %	19 %
	Involvement of experts	25 %	19 %
	Creating something new	17 %	13 %
	"What does Uniori mean?"	17 %	13 %
City	Strengthening technical and business competence of students	8 %	31 %
	Image / brand	8 %	25 %

The meaningful objectives or the values of Uniori, equality and sustainability, were the major motivators (42/50 %), the importance of which is highlighted by the response of one interviewee:

> *"Why on earth I wouldn't be interested in this topic. Who would want to feel that I would not be happy to develop this activity or strengthen scientific thinking or an easier connection to the world of science or the strengthening of mathematical skills."*

The objective of strengthening technical and business competence of children and young as future professionals were separated as it was directly mentioned by one teacher and the focus were on the city side (8/31 %). As Uniori is based on collaboration, cooperation between different sectors, mostly highlighted education sectors, were also seen as motivation (42/44 %).

From the student and learning area, the biggest motivator was the option to find something new and fun for the children and young (25/25 %). With the combination of researching real-life phenomena (17/19 %) and experientiality and functionality in teaching (17/19 %), interviewees were eager for something relevant and better than just *"open the book – close the book"* pedagogical method, as one of the interviewees put it. One interviewee emphasized the importance in this way:

> *"Yes, it is a really important thing for children and young people to be informed that you are now studying the right real-life things here, that something important is being done."*

Quote pointed out that although younger people, like preschoolers, play a lot in school, with Uniori they are able to do much more than "just" play. Also, lifelong learning was brought up (17/19 %) and one interviewee mentioned their thoughts associated with the start of Uniori's development:

> *"I wondered how this would be possible, that general education and even from early childhood to high school could find some common denominator and then not to mention that the university would co-operate and start developing such a whole of science education."*

Work-life stands for the professional needs and desires, as more than half of the teachers raised professional development for the biggest motivator of all areas (58/50 %). This links to finding new contacts (42/31 %) and enriching everyday work (33/25 %), as they wanted to find new ways of working with the help of new people.

From a personal point of view, people were very enthusiastic and inspired (58/56 %) when hearing about Uniori concept for the first time and while joining the development process. Also, some people wanted to bring up the point that they had the opportunity to make a difference for many people and not just for one of their classes and also make the decisions for that (25/19 %). The involvement of experts was also seen as a motivator from the teacher side (25/19 %) as professionals from university and local companies

could bring their expertise which links back to the professional development topic as teachers could also learn from those experts:

> *"Having an expert involved in the process was very helpful, especially in the situations where one's own expertise or experience was not enough for all topics. I would like that this would be involved in teaching as much as possible, I can learn at the same time, and I can use it in my own work."*

Creating something new (17/13 %) was on the bottom of personal motivators as well as the first thoughts like: *"What does Uniori mean, how does it work, what parts does it consists of, how this affects my work?"* (17/13 %), which was linked on the uncertainty of university involvement as seen in some quotations from the interviews:

> *"I had no idea of the activities of the university and how they would get involved in."*

> *"At the beginning, there was no idea about how this is going to turn out to be. -- And even what there is (from the university) to offer to us and how to make it even relate to any of our things."*

5.4 Feedback

The next table (Table 10) focuses on answers from only teachers and principals. The data for this table were collected mainly from all discussions with teachers, except for the area 'Other teachers', which did not emerge from one of the interviewees.

Table 10 Feedback from others about Uniori

Area	Topic	Of teachers
Other teachers	Basic positivity	58 %
	"Is this good enough?" / Guilt of doing enough	42 %
	Nothing negative	17 %
Parents	Basic positivity from parents	45 %
	"I don't know about parents"	45 %
Both	Children teach parents	36 %
Children	More critical consumers (already of going to be)	18 %
	Already think about new education option after primary level	18 %
	Learning require repetition	18 %

'Other teachers' stands for the opinions and feedback heard from other teachers. Basic positivity was the answer of the majority as 58 percent noted, and 17 percent answered that they had heard nothing negative, for the subject has not actually been discussed at the coffee table in the break rooms or elsewhere where interaction with other teachers usually occurs. 42 percent also brought up that other teachers had the same thoughts of *"am I doing enough"*, as seen later on this chapter and noted in this quote:

> *"At least from another school my friend pretty often called me to know 'what this means and what needs to be done'. -- Can they (other teachers) pull those preliminary tasks and what if they don't know the answers. Just basic teacher concerns."*

45 percent felt that they have gained positive feedback directly from parents or through other teachers, while 45 percent had not heard from parents. One interviewee was waiting for some feedback as:

> *"There, at home, measurements and reports are made, so at what point do the parents lose their temper on 'you shouldn't come to examine our homes or review our consumption behaviors'. But I have not heard anything."*

Some of the interviewees pointed out how it is normal in Finland that *"no news is good news"* as one of the interviewees quoted and continued:

> *"Does it communicate the message of our actions more broadly in society, when things are well then they are not presented more widely? When one is satisfied, they are not talked about when it seems to be the default, but then when things are not well, then it is brought up."*

36 percent of the interviewees commented that children teach their parents about the sustainability topics they have learned from school, and e.g. some children question why there are no proper recycling bins at home. One interviewee told about one event:

> *"We did so that we taught all on 'School and home' day to parents. That's when there came quite a lot of feedback. The kids were at different task points and the parents thought it was just awesome that things like these are being studied in today's school. -- The parents were like 'Oh how I haven't figured this out!' and 'I've been thinking about this but now I know what that sewer label is for'. I thought it was really good in all respects."*

18 percent thought that modern children and young are more critical consumers, or they are going to be with the help of Uniori. The same amount brought up that children are thinking more about where they should go to study, even on which lower secondary school they should try to apply for easier access to their desired upper secondary school (high school or vocational school). Lastly, 18 percent reminded that small children need repetition, for example, they need to be reminded that "they have been washing hands for perhaps too long", as one of the interviewees put it.

5.5 Challenges

Table 11 shows the different challenges that the interviewees have experienced themselves or have observed while developing and implementing Uniori activities. All of the teachers had some concerns but one of the city representatives saw the performance

as either good or the problems resolved, so one interviewee has not been included in the data.

Table 11 Challenges of Uniori

	Of teachers	Of total
Differences between teachers or schools	50 %	53 %
Accepting development as a (creative) process	50 %	40 %
Obscure first impression	42 %	33 %
Guilt about not doing enough	42 %	33 %
Joining later	42 %	33 %
Some aspects rely too much on one person	33 %	27 %
Require activity and initiative (from teachers)	33 %	27 %
Workload weight	25 %	40 %
Resource allocation	25 %	20 %
Requires repetition for a smooth run	25 %	20 %
Conceptual challenges	17 %	13 %
Finding the right people	8 %	13 %

The major challenges from both sides were the fact that different schools have different resources, they are different sizes, or have other differences which can affect how Uniori activities are implemented. This could be seen as positive or negative. The same goes for differences between teachers, although Uniori aims to go through the same studies in all schools, implementation rests partly on the shoulders of teachers. Some teachers who are more interested in the activities, can use more hours and make the topics broader and some teachers can do the bare minimum. The differences reach for the content also, as some teachers can focus on different areas than others.

The second greatest challenge was acceptance of development as a process and that it is a creative process. This links directly to the third and the fourth points: processes do not happen overnight and when performing creative activities, everything is not clear from the start. When people are unsure of their responsibilities and goals, people can feel like they are not doing enough for the process and the guilt can stress which makes the process even harder, as one interviewee noted:

> *"I've sometimes experienced that when my own work is so straightforward and then maybe this kind of planning work is a very different type and things don't go*

the same way, then maybe I experience that kind of stress that I haven't done enough."

When a person joins the activities later than others, the above-mentioned challenges also become a problem, at least in part. Joining later includes the development teachers and the teachers who are implementing Uniori program in their classes. Another problem is that when materials have not been self-developed, orientation plays an even more important role in success as teachers need to absorb a larger amount of information in less time. This can also be a challenge when some aspects of Uniori rely too much on one person for people tend to move because of the work of their spouse, change their own jobs, or change their field of work. Indeed, turnover is one of the challenges that is not specified on its own in the table, as it affects other aspects in addition to this point. During the development of Uniori, there has been some staff turnover, which has contributed to various issues. However, this was not seen as a major problem, mainly to be developed and taken into account in the future, as one of the interviewees noted:

"From the beginning, we tried to act in such a way that we did not really have any activity on one card or behind one person, in which case it would last better."

Activity and initiative from the teacher's side were partly seen as a challenge. Some said that if they would have been more active, some challenges could have been avoided. This is also linked to workload weight and resource allocation. Workload weight was seen mostly appropriate, while some saw it too heavy. This was partly seen as interviewees' own fault as they felt they took too much work at the time, partly because they could not assess the workload before the decision. Some saw resource allocation executed well but some have had issues, especially when they could not be replaced by a substitute employee because of their unique job. This led to working on evenings or weekends which is not the aim.

Repetition was mentioned on the children's learning side in the previous table, but it is also important to be noted here from another perspective. It was mentioned that the first year of operation does not create a unified image of the activities for the teachers. After

two or preferably three years running will ensure that the activities are working at full capacity.

The second last challenge mentioned was the conceptual challenges which was a problem mainly at the start. The university has its own LUT Junior University while it and Uniori (Lappeenranta Junior University) are two different things even though LUT Junior University includes Uniori's activities. Schools have also different collaborations such as LUMA (aiming at studies of mathematics, environmental science, natural sciences, and technology) and Pikkuyrittäjät (entrepreneurship education program). With all these different activities, it can be hard to recognize e.g. who is responsible and for which activity.

The last point mentioned is 'Finding the right people'. Uniori is built over motivation aspects listed before in Table 9, the excitement of making the world a better place through the mindsets of children and young. Most of the people who were interviewed emphasized how important the role of the cooperator principal has had, and as said before, the people in this development process have been highly motivated, which can indicate that the right people have been found.

5.6 Proposed solutions

As noted, several different challenges have been identified. It is good to look at these from a solution perspective because building a new service model requires the best possible and functional foundation. Table 12 presents the challenge areas again, but this time from the perspective of solutions. Some of the thoughts arose among the interviewees, for example when asked what they would do differently or what were the biggest challenges and why, while some thoughts are based on the author's conclusions on the strength of interviews as well as a literature review. Uniori is based on a curriculum affiliation operating model, i.e. practically all schools of Lappeenranta are on the same line and in the same starting points. In addition to this, open access thinking is strongly visible, i.e. everything that is done within the framework of the activity is open to everyone. However, as mentioned, schools have different resources and teachers have

different enthusiasm and hobbies. In principle, curriculum affiliation and transparency contribute to reducing these disadvantages but do not limit activities enough.

Table 12 Proposed solutions and improvements

Challenge	Solution
Differences between teachers or schools	✓ Curriculum affiliation ✓ Transparency through open access
Accepting development as a (creative) process	✓ Clear objectives and scope ✓ Room and encouragement for personal adjustment ✓ Shared learning ✓ Continuous development
Obscure first impression	✓ Clear concept and goals ✓ Clear communication channels ✓ Fostering partnerships
Guilt about not doing enough	✓ Creating positive environment for adopting new opportunities
Joining later	✓ Teaching and orientation materials created by teachers
Some aspects rely too much on one person	✓ Extension to work partners ✓ Including managerial levels ✓ Network of contact teachers
Require activity and initiative (from teachers)	✓ Learning material packages ✓ Opportunity to participate in external trainings
Workload weight	✓ Solid orientation ✓ Ongoing support training
Resource allocation	✓ Possibility to substitute teacher
Requires repetition for a smooth run	✓ Sustainable operation model ensured by curriculum
Conceptual challenges	✓ Organizational diagrams ✓ Clear structures
Finding the right people	✓ Finding correct the person(s) ✓ Importance of motivated and willing partners and staff

One point is related to culture because at least on the basis of the interviews, Finnish teachers like the freedom which their work gives, e.g. towards the creation of teaching content and materials. If activity were to be restricted too much, this freedom would be partially eliminated. An example of this is a comment of one interviewee:

> *"On the other hand, it can also be a positive thing to have freedom and creativity when (the scope) is not clearly defined. Giving people free and creative hands,*

and trusting that something ready is going to be created. However, the open timetable, which I was able to define myself, was good."

The interviewee saw the pros and cons of freedom, and in sum, the current model was seen as working well, which is directly linked to accepting the development as a creative process. One solution was seen as a way of working, in which developer teachers are given a clear framework and timetable for deadlines of greater tasks, but the teachers are responsible for the partial tasks and their timing, which makes it easier to fit the school schedule to a personal schedule.

The interviews also revealed desired changes linked to working methods. At the beginning of development, brainstorming could take the form of an intensive week, for example, and especially in the early stages, meetings should be more frequent and last longer. This would bring efficiency, as things would not be forgotten, reducing initial uncertainty towards the activities. In the case of Uniori, the meetings took place over a period of months, which caused the emergence of a clear picture to be challenging for many. Despite this, the interviewees revealed that even this way they have really learned a lot from others. This links to the idea of helpful and mutually shared learning, which Keay et al. (2014) emphasized in their study about communities of practice in the educational environment. Shared learning is one point that deserves attention in future development as many of the teachers had a desire to develop Uniori further and those similar activities could be possible in their work in the future. As a result, it is positive that there was no attempt to complete Uniori at once, as every teacher in development has learned a lot along the way. These learned things can be exploited in the future, and as one of Uniori's goals is, continuous and life-long learning can be seen here as well.

One challenge and first thought from the motivation side was the obscurity of the concept. As Goldstein et al. (2002) and Komulainen et. al (2020) pointed, a clear concept forms the basic foundation and without it, decision making becomes more difficult and challenging. As noted, the nature of the process, and especially the acceptance of the time required for creativity, have been challenges that have been overcome. However, when

thinking about it from a concept perspective, it is good to note the following quote from one of the interviews:

> *"It took quite a bit of time to see what this is all about and what this means. Of course, those first-stage questions were like whether this is now some kind of project that will be erected with terrible enthusiasm and then this will end. When it was overcome that this is not a momentary project now, but a continuous collaboration for the time being, for which solid and curriculum-based frameworks are being sought, then it immediately started to open up and the commitment was strengthened."*

It is often challenging to explain new concepts depending on the person's background and attitude toward new things, so here too, there were certainly some thoughts linking to the idea that this is now somehow an additional burden and out of the normal working hours. Good dialogue and good partnerships should be fostered, and communication channels should be kept open in every direction. Partners like the university should be familiarized with the teachers at the earliest possible stage so that hesitations can be dispelled. Building a solid overall picture helps the development to form more effectively, so here too, the clear guidelines and goals facilitate the common understanding. These points also support the sense of doing enough and reduce feeling guilty. Understanding the school's annual clock, operating culture, and event cycles help to form appropriate time slots to which these processes fit most conveniently. Clear guidelines and teacher guides created by teachers themselves have been facilitating working and development progress also. It is important for teachers to produce teaching materials themselves because they know what works in everyday life and it is their responsibility to teach the material, regardless of who produces it. These aspects also support training and orientation related to staff joining the activities at a later stage, as the materials are easier to adopt.

Uniori's operations are partly built on that it does not rely too much on one person. However, this has not been entirely successful. In primary education, a clear driving force has been one principal, who has been the person in charge of the schools' side in many matters. Correspondingly, there has been one person on LUT's side who has been

responsible for managing the overall package from the university's perspective. The two people have worked closely together, and the work community of the university coordinator has easily been integrated from a university-driven to a school-driven collaboration. However, it is important to note that the university coordinator could need support from the university side and e.g. in the event of an illness, there is no replacement coordinator. In the future, it could be an improvement for the coordinator to find the same level partner on the university side to make the collaboration work easier from many points of view. This would also support the transition if the coordinator changes completely, in which case the understanding of Uniori cooperation does not start from the beginning level from the university side, as one of the coordinators has been working with Uniori for a longer time, in which case, e.g. a trust base has already been created in the direction of other partners.

A similar potential gap can be seen in preschool development work. Since one principal is responsible for all primary education, preschool education is also partly under the principal's responsibility. However, preschool is seen as its own subdivision, which poses challenges from an administrative perspective. In the current model, the responsibility lies with one preschool teacher, and not the corresponding supervisor level. There are many preschools in Lappeenranta, so this is an extensive network to manage. From the point of view of power relations, decisions and aspirations from a higher level work more effectively, even if it is not direct superior. Superiors often also have different educational or work backgrounds to support the job and decisions. For these reasons, among others, it would be an improvement to look at the preschool management system and better involve supervisors, which would shift the high workload from one developer teacher to a wider scope. One course of action that has already been included to solve information flow problems and ease the burden on one person is to contact teachers, which can be a developer teacher or someone suitable. Contact teachers act as support persons at the primary school level, but this too would be important to extend to the preschool level.

The ease of use and functionality of the finished packages has been seen in a positive light. Especially new teachers find it easy to get involved later from this perspective, which facilitates work and reduces the need for the initiative on their side. Many of the

aspects already mentioned in this chapter, such as clear guidelines, also support the work of teachers from the perspective of required activity and initiative. The interviews also revealed external training, which was seen as a supporting aspect for teachers' work as training opportunities give positive improvements in form of methods, thoughts, tools, etc. In addition to external training, Uniori's own internal orientation plays an important role. Even if the teacher has been creating this activity, it is good for them to participate in various support training. The interval between orientation or training and the actual activity should be as short as possible so that the lessons learned can be applied to actual activities. These actions partially reduce workload weight.

In terms of resource allocation, seven of the twelve teachers and principals mentioned substitute teachers to some extent: some have been able to take advantage of the substitute teachers, while others have not due to the uniqueness of their own work roles. Some interviewees mentioned challenges related to substitute guidance which, however, can be solved in the same way as normal substitute challenges, options such as the correct answers provided in the teacher's guide. Substitute teachers are an important part of enabling Uniori operations, as they reduce workload weight and resource allocation, at least in the development phase.

Some of the interviewees described the importance of repetition for functioning activities. With repetitions, activities begin to work more efficiently and effortlessly. Because Uniori's operations are recorded in the curriculum, the continuity of operations is ensured and a project mindset is faded away, which supports a more sustainable basis for operations. This is supported by two comments from the interviews:

> *"And then of course it's all anchored in the curriculum, meaning that this isn't any extra activity, it's a normal activity."*

> *"It's not something 'extra' but it's a must. (It is) strength of being included in the curriculum."*

This helps also to perceive the concept, as it has already had to be created in a written form. Different organizational and collaboration diagrams help to outline different sections and clarify the responsibilities of specific individuals. However, this depends a lot on how different school organizations operate in general, which means that the problem is not just with Uniori but with other activities too.

The last challenge in Table 12 is finding the right people. Interviewees mentioned the importance of charismatic people. In particular, the importance of the principal in charge of Uniori activities was emphasized in several interviews. He was seen as an important initiator and supporter of daily work, which is the enabling force for Uniori operations. His importance was really emphasized and without him, Uniori could look really different. Based on the interviews, it could be stated that one of the most important aspects of the operation is to find those important executives who have the strong will and strength to start developing this type of operation and collaboration model. Although the percentage is small, the importance of that principle was revealed extensively in many interviews. In addition to this the person, enthusiastic and motivated staff were highlighted in interviews:

> *"In a way, it shows that this is an important aspect now and here is a unique opportunity, so it has been supported, and in a way, the internal motivation of the people has been high enough. It has been shown, that kind of love for the sport, so to speak."*

In addition to the challenges outlined in the table before, there were a few things that the interviewees would do or consider differently. One possibility was seen as involving children in development activities, which emerged also in the study of Morelli (2009) of children's unusual creativity. Designing with children has its own advantages, but also its own challenges, such as one interviewee pointed out:

> *"It's a bit challenging for some (to understand) that if we just talk on a symbolic level, that there are such models of action planned, what it sounds like, then some*

can, some don't, but then if you've involved in that process yourself, then it's much easier (to understand)."

Functionality is an important part of the design process with children. Functionality is an essential part of Uniori's current operations, so some want to increase the functionality from e.g. the research side. One goal of Uniori is to guide children and young people towards university studies, so adding research as part of Uniori's activities would further guide children, as getting to know research methods would partly increase children's interest. In addition to this, it is good to provide children with wide-ranging learning options and deepen them. An example is entrepreneurship education for fifth graders, where teaching has focused on entrepreneurship from a product perspective, and services were initially ignored as such. It is easier for children to understand products and product ideas, whereas service concepts and service design are more challenging but very relevant for future life and studies.

6 ANALYSIS AND DISCUSSION

The previous chapter explored Unori's activities and the concept, as well as how it could be further developed and what steps have been taken so far. The result of the thesis is the development of a new service model (NSM) based on Uniori which is offered as a customizable version to other customers. As the study by Komulainen et al. (2020) described, standardized services are not easy to implement. At this point, it is good to examine once again the service design process with this new service model in mind. After this, a variety of key points for successful implementation need to be assessed before going through the NSM content module by module in more detail. Finally, it is good to consider further development of the NSM, as the scope of the thesis has set certain limits.

6.1 Key results

In terms of the process perspective of service production, an example can be considered a model adapted from Tuulaniemi (2011). On this larger scale, Uniori can be thought of as being at the beginning of the process in phases of definition, research, and designing. With Uniori, it was possible to identify the problem to be solved and to explore what alternatives there are currently available. With Uniori, customer understanding was gathered from a Finnish city of about 70 000 inhabitants (Kuntaliitto 2021) over a couple of years of operation and the operations were viewed through the first actual customer in an even smaller city, Imatra, in the form of Universoma model. Uniori's operations in Lappeenranta have provided ideas and a concept on the basis of which it is possible to start implementing a new export product and education model on a larger scale in different cities. The implementation phase is the export of the NSM to another country, where it is first piloted and then put into actual service use. It is good to develop the NSM for considering the constantly changing customer needs, which gives the service a comprehensive customer base. In all the final stages of the process, it is good to take into account the iterative approach, in which case the service can be refined as requested by Tuulaniemi (2011) and the most critical development targets of the service can be found in time.

Highly customizable solutions are one possible way to approach the NSM, but if the idea is to base the model on the values of Uniori and LUT, as well as the proven practices, it is good to orient the NSM towards a standardized solution-centric model and focus on modularizable parts. One option is to involve new customers in the module development processes, thus continuing to advantage from co-design benefits. In order to keep LUT's share of the workload as light as possible, the modification of the modules could be the responsibility of the client or their partner university. Chapter 6.3 presents in more detail the NSM and its modules which could serve as a starting point for LUT's education export service.

Education can be seen as a service product and education exports as a value-adding service that strengthens the brand image. LUT benefits from developing the service for the international market, for example from a marketing point of view, as positive local visibility in the exporting country can increase the number of applicants for international students to LUT's university degree programs. However, the NSM aims at co-operation between the local school and the local university in the exporting country, leaving the visibility of LUT in a smaller role compared to the visibility of the local university. Also at the general level, the international visibility of LUT is increasing, because as mentioned, LUT has been awarded for the current Uniori model, so a new type of Uniori-based model can bring additional visibility. In terms of different competition strategies, NSM is a unique product on a certain scale, so competition with price does not add value. In this case, focusing on the customer experience would also increase the quality of the service, as the experience of the service is one of the clear advantages and it is easy to invest in this kind of service. Since Uniori was created together with one customer, the value proposition is largely based on that cooperation and the value propositions that have arisen from it. The challenge for LUT is to build new relationships with new customers and find those partnerships which are mutually satisfying. The advantage of LUT is the green and sustainable values integrated directly into its operations, which is also conveyed through the NSM provided. Responsibility thinking is something that many countries are just beginning to wake up to and take an interest in when the necessary civic education is not yet available and a sustainable society is in its first steps. In addition to this, the strength of the Finnish university is to provide Finnish high-quality and world-

renowned education. These values strengthen the brand as well as the attractiveness of the NSM for different customer segments.

As noted, transnational education is already fragmented in terms of terminology alone. One important consideration is what kind of message about the activity is conveyed and in what way. It is ideal for a potential customer to understand from the beginning the targets and scope of the NSM, so consistency of communication plays an important role, even at the university end as the study of O'Mahony (2014) revealed and as Knight (2016) pointed out, education export does not only involve exporting education between universities. Due to the changes related to education exports in Finland, the regulatory and monetary aspects are moving in a better direction and with the help of possible future changes, e.g. the NSM type of activity could also be seen as a supported activity.

Linguistic challenges and inequalities related to internationality were mentioned as one of the challenges in education export activities. This poses challenges in part to the fact that in the most developed countries, international education may already be at a top-level, which means that there is not so much demand for an export product like the NSM. Correspondingly, in developing countries, demand has increased for services such as NSM. However, the low level of development poses its own challenges, for example in linguistic interaction. Although the target country's primary school has staff fluent e.g. in English, instructions and materials require translation work, which can lead to misunderstandings if conversations between LUT and its customer take place in one language and different in the next link in the communication chain. A clear unified line that stays on the LUT side throughout the process facilitates the situation but does not fully solve the challenge.

In addition to language, different cultural challenges need to be considered. Not all current material as such can be exported to another country. One interview highlighted, for example, that in Finland alone, some may consider toilet issues too private to be covered in lessons on wastewater-related topics. In other cultures, the issue can be seen even more strictly, in which case some parts of the concept may not be feasible as such but require cultural adaptation. This is good to consider not only the contents but also the structures

so that different modules can be applied to the extent appropriate to different cultural practices and standards. This applies, for example, to the pace of learning, students' starting points, appreciation of teachers, and pedagogical methods. However, the idea of the NSM is to focus on equal teaching and building up technical and sustainable development capacity, so pruning the NSM's values is not a direct option. When implementing the NSM, it should be noted that the model is not pushed from the perspective of superior Finnish education, which could activate the defense mechanisms of different cultures, but should be based on benefits and cooperation. An open and easily accessible communication path is good to achieve, as is a clear concept so that if communication fails for some reason, there are various precautions available.

Based on different literature studies, some notions can be utilized in the development of the NSM. Bovill et al. (2015) found four aspects that work better in cooperation between universities. Juusola and Räihä (2015) focused in their research on three themes, of which providing support to teachers in connection with cultural and linguistic challenges is most valid for this model. To some extent, the material needs to be developed into an export product, so it is a good idea for staff involved in its processing to take into account possible constraints in the target countries and to simplify, modulate, and standardize certain aspects as far as possible, and this certainly needs support. This point is also supported by the study by O'Mahony (2014), as in addition to culture, social aspects of teaching need to be taken into account and target countries need to be considered up to a certain point.

6.2 Evaluation of the results

Chapter 5 assembled information on the concept of Uniori. Based on this information, it is possible to further develop existing activities and create a new service model. The chapter revealed Uniori's development possibilities, most of which can be implemented in the development of the NSM. Figure 19 serves as a simplified visualization of how the interaction between NSM partners connects. Customer indicates the customer of LUT, which can be depending on the segmentation and different possibilities, a private primary school, a city, a province, or even a small country. The idea is that this customer seeks a

suitable university partner or partners with whom the customer is going to implement the NSM. The university partner can be used to bring in various elements that are important for operations, which LUT has correspondingly brought from Lappeenranta's point of view in the Uniori model. In addition to this, the customer must build a network of companies, unless it already has such collaboration from other daily operations. The university partner and the network of companies, bring ideas and possibly sponsor e.g. materials and measuring instruments or devices. The university partner and the network of companies also collaborate with each other in the implementations of 8th grade workshops as well as in different content for 3rd graders.

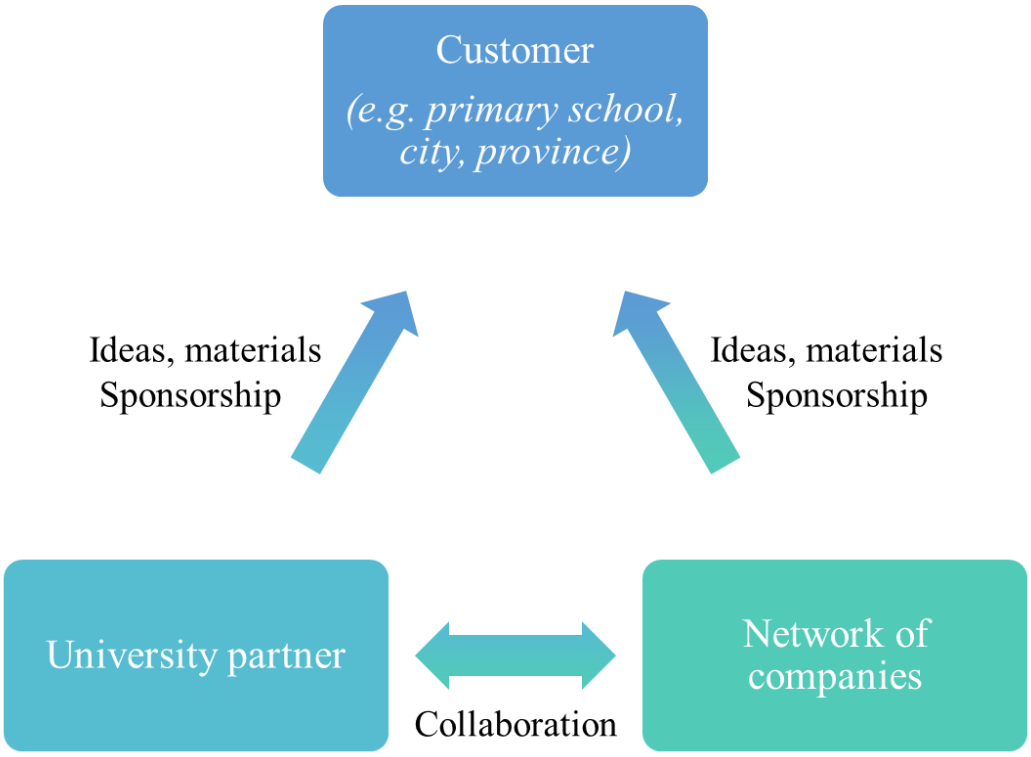

Figure 19 Interaction model of NSM

A platform for digital sharing needs to be developed for the design, development, and exploitation of the materials. Although the university and companies help to prepare the learning materials, it is good to create the material in a teacher-driven way, as mentioned earlier. When utilizing company professionals and university researchers or students, the workload for teachers must be taken into account. As the person who is responsible for the lessons or workshops remains constant, the same material can be utilized from year

to year and developed further without the workload towards the teachers remaining the same every year as did in the first year of development.

In the next chapter, the modules of NSM are reviewed one by one, but before that, a few more general points need to be considered regarding the model. The most important thing in implementing the NSM is to link its activities to the local curriculum, if possible. The importance of including the NSM directly into the curriculum cannot be overemphasized, as the model is not intended to polish diamonds even brighter. The NSM aims to support the development, study, and career opportunities of all children and young people, regardless of their background. In this way, equal opportunities for all are ensured. The NSM supports the interest of children and young people, especially in science and technology, together with sustainable development. Children and young people will be introduced to the university and a more stable path towards higher education will be provided and a more sustainable society will be built.

Another important aspect for the NSM to succeed is finding the right people, especially those in managerial positions. The interviews showed how significantly the responsible principal has had an impact on the contribution and well-being of the teachers involved in Uniori activities. Thanks to the principal’s contribution and charisma, many things have been possible to accomplish with their current form. Finding similar people as part of the implementation of the customer's NSM operations is important. In addition, the interviews noted the importance of teachers' motivation for development and participation in Uniori operations. Many different sources of motivation emerged, so Uniori successfully satisfied a variety of professional and personal needs in addition to the goals of Uniori. The NSM, therefore, supports the participating teachers which are directly linked to the efficiency and functionality of the model. Without a motivated staff, the benefits of the model are nowhere near as extensive.

In addition to these two main points, a few other things need to be considered, such as that in different countries, children start school at different ages, so the suggested age groups of the NSM may not always be directly executed. It should be noted, however, that the proposed modules of the model are repeated at certain intervals; there are two

grades levels between the first and second modules, one grade level between the second and third, and again two grade levels between the third and fourth. These can be customized partly, on the basis of the customer's education system, and further developed, e.g. to apply to every age group if, for some reason, it is found to be a more functional practice. Although there are subjects mentioned in the modules, which can also be found in Figure 17 of Uniori's content, the modules are also linked to many other subjects, thus to multidisciplinary learning, as one of the interviewees pointed out:

> *"It was, of course, social sciences, but it's also Finnish language studies, it's also math, then you got visual arts, so in my opinion, it didn't felt that all other things were excluded but they were included, which was a really nice thing. "*

In the NSM, it is also good to consider the links to the curriculum of the customer country: in the case of Uniori and Finland, social studies starts normally in the sixth grade, but with the Uniori program, many topics are already covered in the fifth grade. This was seen as a challenging but also a positive thing, as the learned lessons prepare for the next academic year. In addition to this, it is good to take culture under consideration so that the themes do not cause anxiety to children. Some may feel that the fate of the world is the responsibility of these children and young people, but it should be guided to the way that they can start making a positive change now and study a career with which they can develop future solutions.

6.3 The modules of the new service model

Figure 20 presents the new service model in full. The NSM is very strongly based on Uniori's current implementation, but the module model seeks to clarify different options as well as to provide suggestions for improvement. The modules of the model could serve as a starting point and as core modules that could be expanded depending on the customer's interest and needs. In order to make the implementation of the NSM in the client country as light as possible on LUT's side, various customization options and tools could be provided for the customer's use, but the extension of the model would remain as the customer's responsibility. The key of the model is to integrate sustainability tightly

into each module. The modules will be reviewed next piece by piece, so the specifics and key topics of each module can be covered in detail.

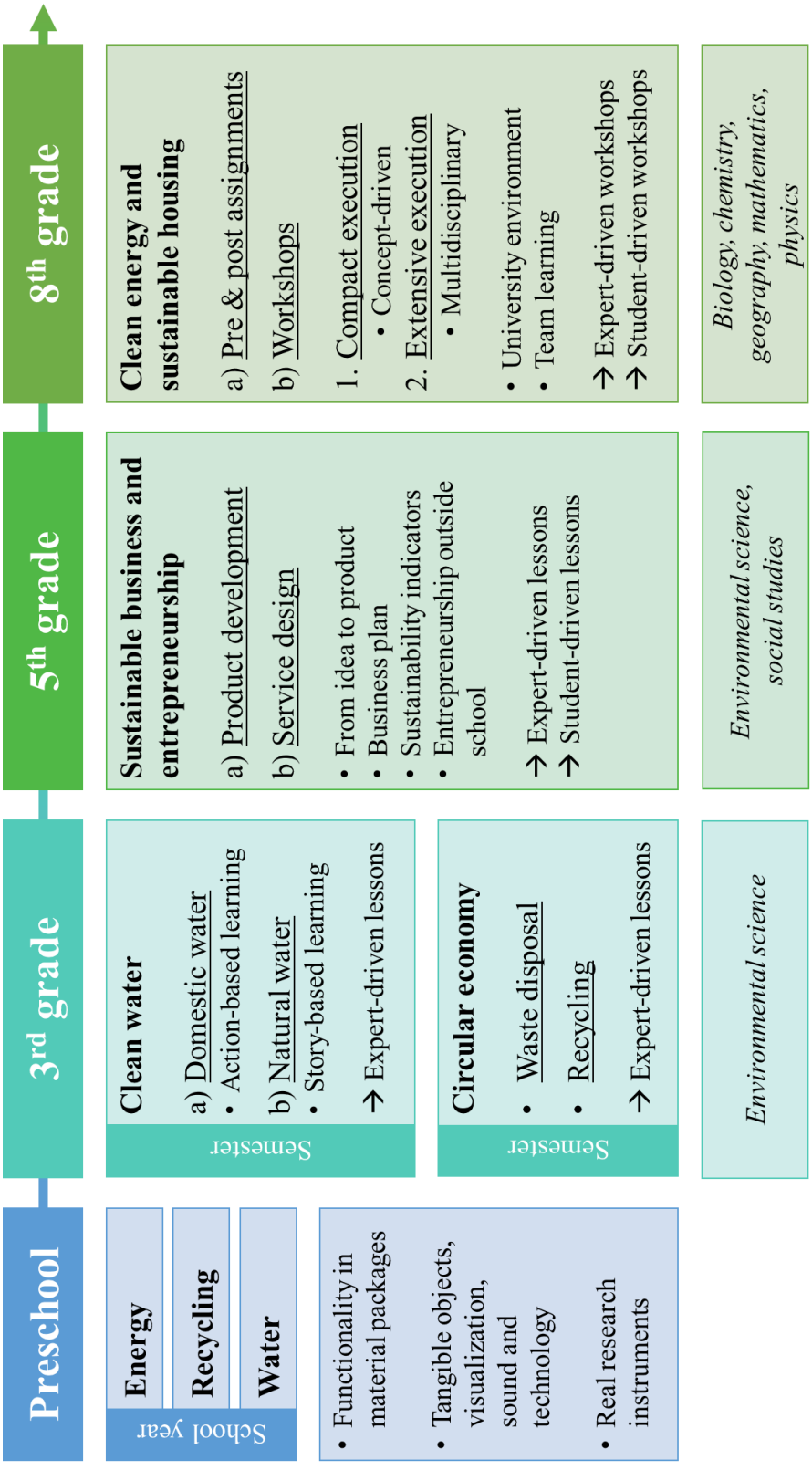

Figure 20 Module chart for the new service model

The preschool main module is spread over the entire school year. The module consists of three sub-modules: energy, recycling, and water. the emphasis of which is not tied to the implementation. No further emphasis has been presented on the sub-modules, but topics can be addressed with either a customer-oriented emphasis or a direct children-oriented emphasis. The latter means that children can come up with ideas for themselves for what they would like to explore and which they consider important, thus emphasizing the importance and interest of the topics from children's perspective. Regardless of the implementation method and prioritizing of the sub-modules, the customer must pay close attention to the module's age group, as these are young children, in which case the appropriate learning methods must be chosen for them. Based on the findings from Uniori, the chosen forms are listed in Figure 21.

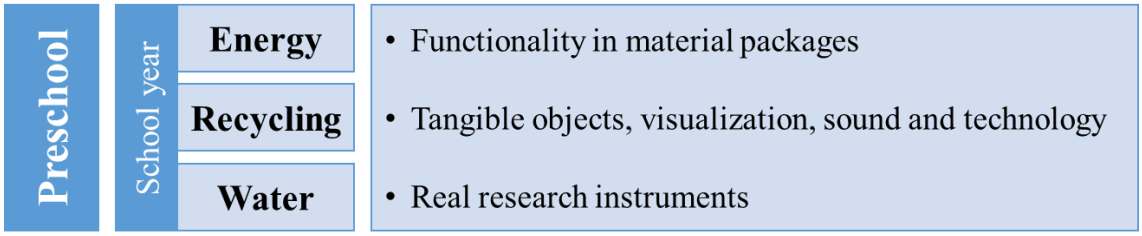

Figure 21 NSM module for preschool

At present, each preschool has its own material box, and the box contains various objects that can be touched and explored by hand and other senses. Different objects each have their own purpose in terms of learning, and the abilities of the age group should be noted when choosing the different objects. It is good to have the right real-life research tools, instruments, and measuring devices, with other simpler objects. The research tools increase children's sense that they are really researching the real-life aspects, and they will continue to remember the positive emotions associated with research.

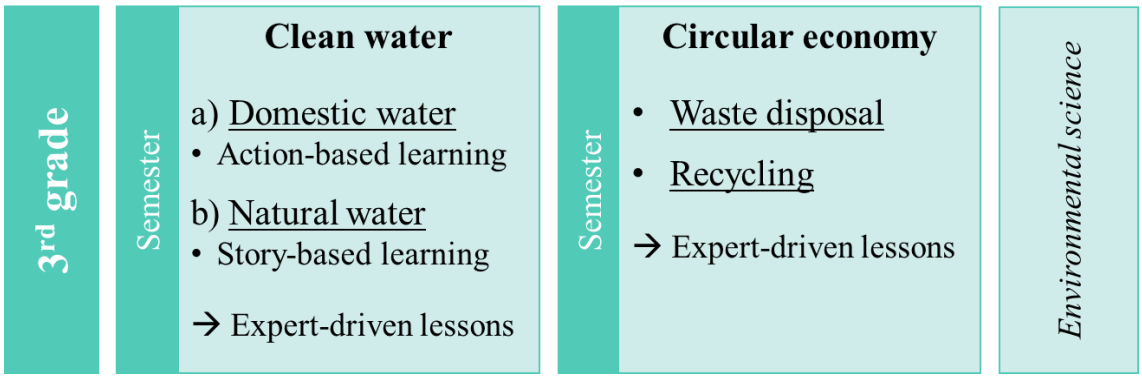

Figure 22 NSM module for third grade

The third graders' main module is divided into two major topics: clean water and circular economy. The two modules are each focused on one semester, one in the fall and the other in the spring, as seen in Figure 22. The modules are based on environmental science. The first of the modules is clearly divided into two sub-modules: domestic water and natural water. Domestic water focuses more on action-based learning for children to explore and study things through active tasks. For example, this sub-module can utilize a wastewater treatment plant professional from a company or a university. The professional can tell about the topic from their own work-related perspective instead of a teacher who knows less about the subject and who would utilize only background materials. The natural water sub-module focuses on storytelling methods, as Uniori has utilized a story about the journey of a water drop. In this method, the age group must be taken into account in the sense that children that are too old do not necessarily benefit from storytelling but would already need something more concrete. In this respect, it is good that the third-grade module focuses more on doing, but also considers the benefits of a story-driven method.

The latter module focuses on the material box, as did the whole preschool, so the lessons learned in the preschool may be strongly remembered, thus maintaining positive reinforcement. Topics of the circular economy include, for example, waste disposal and recycling, and lessons can be also expert-driven. Again, a researcher on the topic from a university or a professional working on the topic may come to hold classes on the topic.

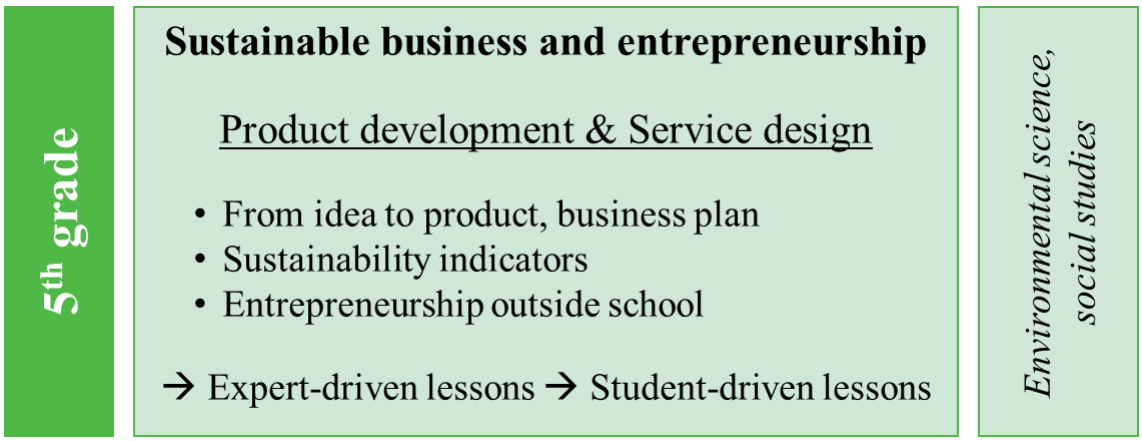

Figure 23 NSM module for fifth grade

The main module of fifth graders focuses on sustainable business and entrepreneurship, as seen in Figure 23, and the main subjects are environmental science and social studies. As learned from Uniori, it is an improvement to include both product and service perspectives from the start as the importance of services is growing rapidly, so understanding them will be valuable in the future. The module utilizes a business plan as a tool to develop the final product and business from the thoughts and ideas of children. Companies of the children are measured by a variety of sustainability indicators to introduce sustainable business to children through their own business ideas. In addition to this, children can be encouraged to do their business-related tasks outside of school, allowing children to learn an entrepreneurial mindset in one way. It would be an improvement to use different entrepreneurs for their stories of their companies which open up new ideas and create a different atmosphere for learning and commitment in the future as well. In addition to this, it would be a benefit to include especially those companies set up by the university students, because then the age difference does not seem so huge and the children get excited in a completely different way. The length of the module is not specified, as it is good to coordinate it more closely with other studies.

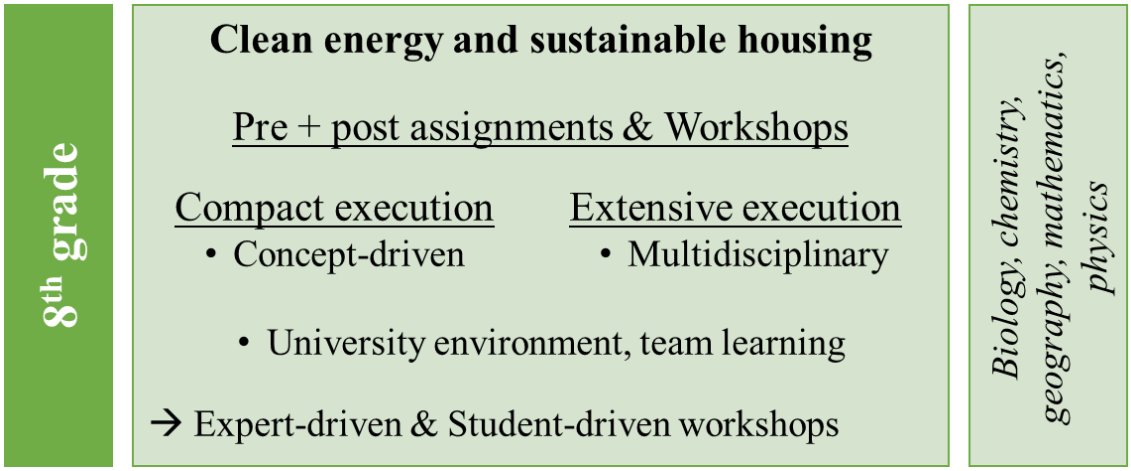

Figure 24 NSM module for eight grade

The last module (Figure 24) is aimed at eighth graders. This module aims studies in biology, chemistry, geography, mathematics, and physics, and its main topic is clean energy and sustainable housing. The module consists of different pre- and post-assignment which are performed before and after the workshops. This module is the only one that clearly delimits two possible lengths, one more conceptual and compact, and the other more multidisciplinary and extensive. The essence of the module is the workshops at the university. This brings the university closer to the young for the last time before choosing the next level of education, allowing young people to choose a specialized high school or line that supports a particular orientation. The workshops can be carried out, for example, with the help of professionals, researchers, or students of the university. The materials for the pre- and post-assignments should be implemented by the teachers but based on the workshops conducted at the university. It is good to have workshops on different themes, as in this age group there are more different views and interests, which are good to support with different workshops. The workshops also support team learning and guide young people to work in groups, for example from the perspective of future working life. As with the previous module, the length of this module is also good to coordinate more closely with other studies, considering the chosen form of execution (compact or extensive).

6.4 Future research and recommendations

As mentioned in chapter 4, the three-step approach was introduced by Trischler and Scott (2016). The first step of target group analysis via the use of personas could be applied for examining how students and teachers of Lappeenranta have perceived the learning process when studying and teaching Uniori's classes compared to other schools or time before Uniori. Application of visualization could give the touchpoints of experienced teachers and students have had during Uniori's classes and use of observation could analyze these touchpoints in-depth. By this approach, with large-scale studies in the longer time period would provide a comprehensive picture of the operation and its visible benefits, and could work as the basis for a deeper understanding of Uniori's activities, but it was excluded in this thesis due to the limits of COVID-19 pandemic and the limits of scope and time frame. Still, this approach could be the basis for future research, if the baseline data of this thesis is not sufficient for the development of the new service model.

However, regardless of whether Uniori's successful operations are explored in more depth or not, it is useful to explore more specific customer needs in addition to the major themes offered by the NSM. Conducting market research and analysis with exploring different education systems could provide a solid foundation for the operation of the NSM from the point of view of marketing and sales. Understanding the customer needs in-depth and finding potential target markets would also facilitate the development of NSM from a service design perspective. Including co-creation with new potential customers would bring significant benefits to further development and implementation of the model.

7 CONCLUSIONS

The thesis introduced the current perceptions of service design and education export. Both topics are constantly evolving as their importance in society grows. Service design is seen as a business support activity, but also as an important part of building successful services. Although there is disagreement about the processes, the basic principle is very similar in all models. Indeed, the benefits associated with value creation are often comprehensive and they steer operations strongly in the direction of co-creation. Similarly, education exports have begun to emphasize the importance of co-creation rather than a competitive environment. Education export is still a growing sector that has not reached fully standardized and clear lines of possible modes. The sector is very challenging and requires many different aspects, such as culture and communication, to be considered an important part of the operation.

These two themes are combined in the collaborative service model developed based on Uniori's activities. Uniori's operations originate in Lappeenranta, where it has been developed and implemented for a few years in cooperation with various partners, such as LUT University, local primary schools, and companies. Uniori aims at equal education, so its activities are recorded as part of the local supplementary curriculum. The goal is to increase the interest of children and young people in science and university education while teaching the importance of sustainable development now and in the future. A similar model has not been implemented in the past, so it was compared to three different models to detect similarities and differences of different type operations. However, it is a unique model that has attracted international attention and for which there is global demand.

Based on in-depth interviews with different partners, a coherent framework could be found, and the development of a new service model (NSM) could start. The NSM is a service- and collaboration-based model which is produced through education export activities. The model is currently on a theoretical level (the theoretical result of the thesis) but it could be implemented as LUT's export product, which would be traded to different countries, developing countries as the most potential markets. The customer can be a local

school, e.g. a private school, a city, a province, or in some cases even a small state. It is the customer's responsibility to find a local university partner with whom to implement the NSM, as well as a network of companies that supports the NSM operations. LUT serves as a support for the local development and piloting of the NSM but does not act as an actual university partner in the long run.

The NSM is very strongly based directly on the Uniori concept, but interviews and literature have complemented the model. The NSM consists of four main modules, divided into age groups at two-to-three-year intervals from preschool to lower secondary school. Within the main modules, there are varying structures to cover the learning needs and capabilities of different age groups. The standardized modules offer choice and are applicable to different clients and different cultures, as they can partly be offered as such, but changes are sought to be avoided in certain areas. The operation of the NSM is good to build on a long-term and sustainable foundation with the help of local curriculum, activities should be offered to everyone regardless of the background of children and young. In this way, the whole age group is strengthened, and opportunities that would not otherwise be possible are offered to everyone. Another very important key point in a successful implementation is to find just the right people on the customer’s side. The activity itself is very motivating, as the study found, so for its part, this should not be a challenge. However, for cultural reasons, this may require more work, but without enthusiastic people, it is not possible to get the most out of the NSM benefits. The most important role is played by those in managerial positions, such as the responsibility principal, whose charisma and ability to commit to their staff causes positive development in the organization which contributes immensely to the operation of NSM.

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