# Study success at the Turku University of Applied Sciences

**Comparison between students of path studies background and joint-application background and comparison between different study fields**

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Master's thesis

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**Abstract**

This thesis examines the study success of different student groups of Turku University of Applied Sciences. Study success is measured in this research with the amount of credits and weighted grade point average. Two research questions are presented to explore the phenomenon, first one concerns the possible difference in the study success of path students and students with joint-application background. The second research question looks at the differences between the study success of four different study fields. The data has been collected from the groups of students starting their studies in the Turku University of applied sciences in four semesters: autumn 2017, spring 2018, autumn 2018, and spring 2019. Theoretical background of the thesis is based on the previous studies on the factors which affect study success in higher education.

Results of this study show that there are no statistically significant differences between the study success of students with path studies background in comparison with students with joint application background. Nevertheless, when looking at the differences between different study fields, statistically significant differences can be found. Results provide new knowledge about the study success of the students studying in the universities of applied sciences. Results show that the way of access to universities of applied sciences does not seem to relevant for the later success in studies and that instead, other factors, such as study field, explain the differences in study success.

**Keywords:** study success, university of applied sciences, path studies, study field, student selection, lifelong learning

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# 1. Introduction

## 1.1. Introduction to thesis

This thesis research is interested in analyzing aspects of study success, and in particular, the study success of the students at universities of applied sciences. Study success of the students studying at universities of applied sciences has not been researched before this thesis. This thesis aims at producing new knowledge about the phenomena of study success by comparing study success of different groups of students studying at universities of applied sciences.

This thesis has been commissioned by the Turku University of Applied Sciences. Turku University of Applied Sciences is one of the biggest universities of applied sciences in Finland, considering the number of students. Among all the universities of applied sciences in Finland in 2020, Turku University of Applied Sciences was in the 4$^{th}$ place for the number of applications received and in 7$^{th}$ place in terms of students who got accepted and received their study place. Ranking has been similar also during earlier years. In the year 2020, total 3,015 applicants accepted study place at the Turku University of Applied Sciences. Out of those more than 3,000 applicants, 372 students were accepted through separate application route and 2,643 were accepted through joint application route. (Vipunen 2021a.)

Not only the demand of higher education has increased, but also open higher education has expanded throughout the last years. The credits achieved in open universities of applied sciences has tripled from the 2015 to 2020 and the number of students has quadrupled. Thus, it is important to study higher education and especially open higher education. (Ministry of Culture and Education, 2021.) Even though the importance of open higher education has grown, little research has been done about the open higher education students' success in their studies. This research aims to fill the research gap concerning open higher education students' study success in their degree studies compared with joint application students, and also comparing the study success of students from different study fields.

After the introduction to the topic, this thesis begins with exploring relevant literature about the development of universities of applied sciences, changing student selection to higher education, lifelong learning, how to measure study success in higher education, factors explaining study success in higher education, and then this research continues by introducing theoretical framework of the study. After the relevant literature, research questions and hypothesizes are

presented. In the following chapter the population and data, variables included in the study, methods of analysis, and questions about trustworthiness of the study are discussed in more detail. In the results section, the results of the quantitative analysis are presented and divided by semester. In the last chapters of this thesis the results of the analysis are discussed in the light of previous research and conclusions are made based on the results of this research and the theoretical background.

## 1.2. Contextualizing Finnish education system and access to higher education

Students begin their study path towards higher education by going through first the basic education in comprehensive schools and then continuing to upper secondary education. For students to be eligible to apply to higher education institutions, they need to complete either high school or vocational school after basic education. Earlier obligatory education covered basic education but since autumn 2021 it extended until students turn 18 years, which means that students are required to apply to either high school or vocational school after basic education. Figure 1 explains simplified how the Finnish education system is built.

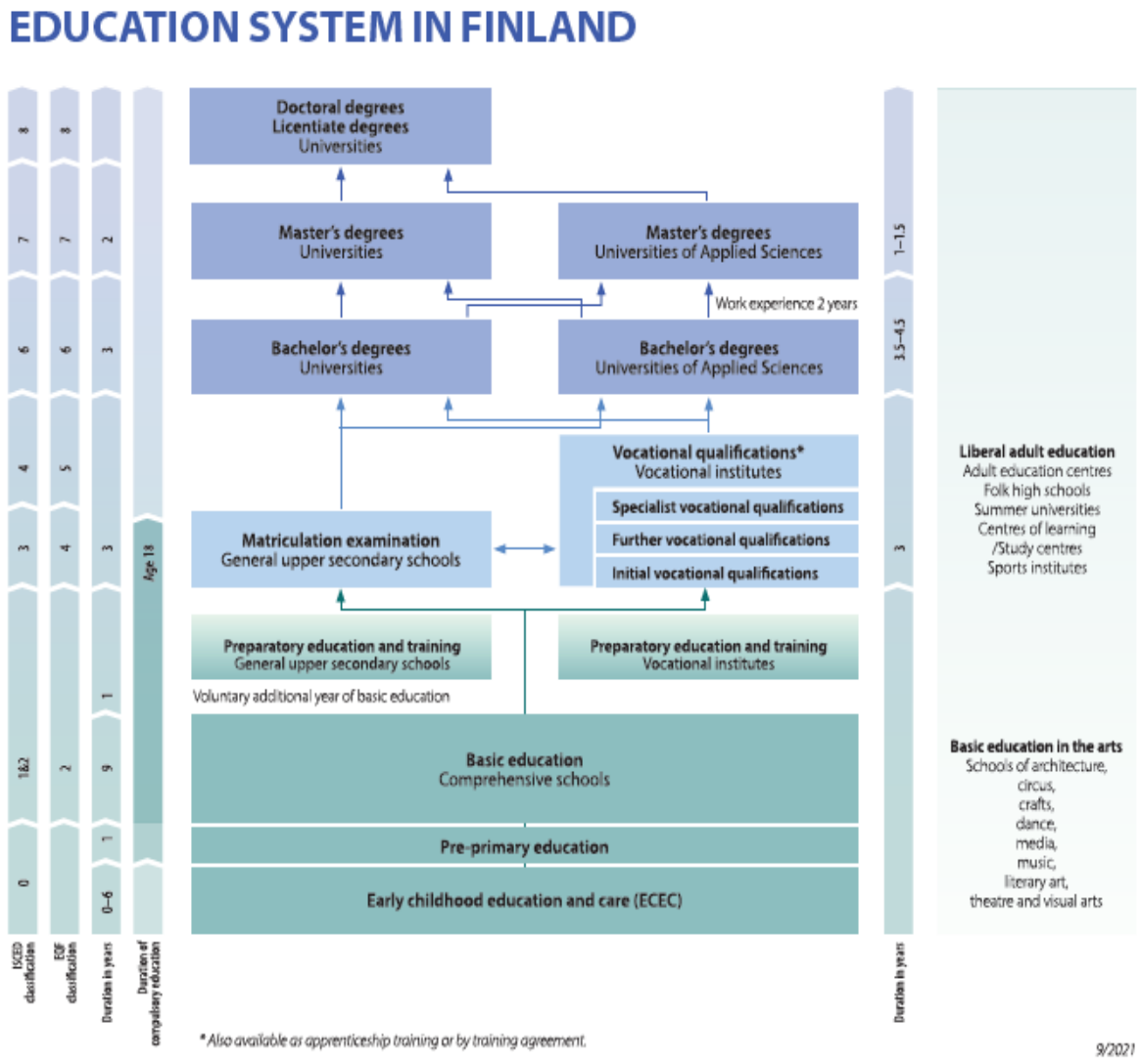


*Figure 1. Finnish education system. Note. Reprinted from the Ministry of Education and Culture website 2021.*

Higher education in Finland is based on binary system; universities represent academic and scientific option whereas universities of applied sciences focus on organizing more practical education and applied knowledge targeted for working life's needs. There are currently 13 universities and 22 universities of applied sciences in Finland. (Ministry of Education and Culture, 2020.) Universities of applied sciences offer bachelor's and master's degree programmes while universities offer not only bachelor's and master's degree programmes, but also doctoral degree programmes.

Within the binary higher education system, this study concentrates on the universities of applied sciences and bachelor's degree education. Bachelor's degree studies at universities of applied

sciences consist of either 210, 240 or 270 credits, with each credit equaling to 27 hours of work. The indicative duration of studies is 3,5 - 4,5 years. Bachelor's degree studies are organized either as day studies or multimodal implementations. Most of the courses belonging to day studies are organized during daytime while multimodal studies are organized during evenings and as intensive courses. Multimodal studies are organized in a way that it is suitable for working adults to participate in them. Furthermore, Universities of applied sciences offer master's degrees in which students can apply after completing bachelor's degree and having at least two years relevant work experience. (Ammattikorkeakouluuun, 2021a.)

Even though universities are notably older institutions than universities of applied sciences, the number of students applying to universities of applied sciences has been higher during last years than students applying to universities. There were 134,805 applicants for the universities of applied sciences for studies beginning in 2020. Out of all those who applied 48,459 students accepted the study place offered. The number has increased steadily during the last five years. (Vipunen 2021a.)

Traditionally the admission to higher education institutions has been based either on the upper secondary school diplomas or the entrance examination score, or these both combined. In addition, some fields might organize interviews, or other types of methods to assess the applicant's suitability to the program. (Isopahkala-Bouret, 2019.)

Students apply to higher education either through joint application or separate application. Joint application means that student can apply with one form to a maximum of six study programmes organized in higher education institutions. Separate application means that students can apply straight to the educational institution with a separate application form. (Opintopolku, 2021.) The majority of the students apply via joint application route; in the year 2020 the total joint application students' numbers were 119,475 and separate application route 21,582. In the same year, out of 21,582 separate route applicants 41,12 % got accepted, whereas the number for joint application is 33,2 % out of 119,475 applicants. The separate route applications have been increasing considerably, approximately fivefold in five years. (Vipunen 2021a.)

As explained in the Figure 2, at the Turku University of Applied Sciences, the route to degree studies goes either through joint application or separate route application. In the separate application route, students can apply for a degree study based on their previous studies at the Turku Open University of Applied Sciences. Previous studies at the Turku Open University of Applied Sciences are completed either as path studies or by completing individual courses. The

student can apply via the separate route to one of Turku University of Applied Sciences' study places. Applying in a separate application does not limit the applicant's possibility to apply in a joint application to a maximum of six study places. However, an applicant may accept only one study place leading to a degree from studies beginning during the same semester. (Turku University of Applied Sciences, 2021.)

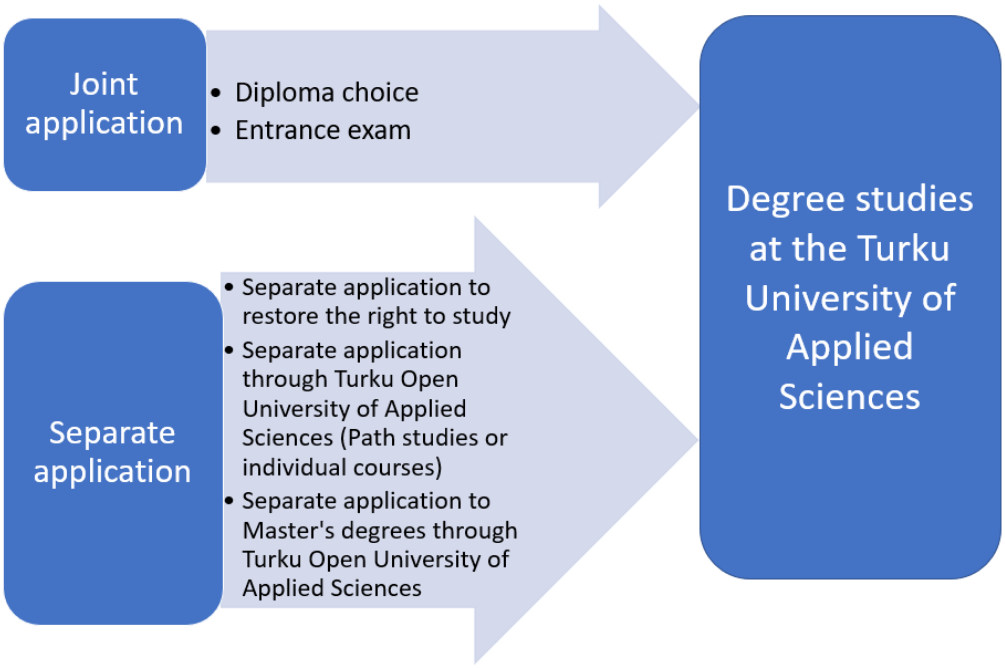


*Figure 2: Different routes to the degree studies at Turku University of Applied Sciences.*

### 1.3. Open higher education and path studies

Universities and universities of applied sciences have expanded the provision of their open higher education studies. Open higher education offers a possibility to familiarize with higher education, to update education, and to gain new skills. In most of higher education institutions open higher education studies can be utilized in the student selection. Open higher education has many aims, such as enhancing lifelong learning, supporting the route to degree studies, guaranteeing equal options to get a study place in higher education and general educational task. The state finances the organization of open higher education. Higher education institutions can also charge small fees. Open higher education does not usually have any entry requirements. Both in universities and universities of applied sciences offer a possibility to apply for degree

studies based on the studies conducted in the open higher education. In universities of applied sciences, the route to degree studies through the open studies is called path studies. (Ministry of Education and Culture, 2021.)

The term path studies mean that students apply to begin their studies at the Open University of Applied Sciences, with a possibility to later continue the same studies further to pursue a degree. No entry requirements are in place for applying for path studies. Selection criteria for path studies is either a motivation letter or a lottery, meaning that students are randomly selected. Path studies consist of courses that are included in the first year of degree studies. The path students study their first year of courses integrated within the same class with the degree students. If a student completes path studies successfully, the student may apply for degree studies via the separate application route. (Turku University of Applied Sciences, 2021.)

Turku University of Applied Sciences has 22 programs for path studies, including fields from Engineering, Business Administration, and Social and Health Care. The scope of bachelor level path studies is approximately 55 credits. Student can apply for degree studies if, by the end of the application period, if student has completed at least 35 credits of studies in accordance with the curriculum. The selection of students into degree studies is based on the weighted grade point average of the studies completed at the Turku Open University of Applied Sciences. The path studies are a relatively new way of studying at the University of Applied Sciences as these studies have been offered since 2016. (Turku University of Applied Sciences, 2021.)

Even though path studies are relatively new route to degree studies, already in 1997 there was first time education arranged at open universities of applied sciences and after that open education has expanded to all the universities of applied sciences (Haltia, Leskinen & Rahiala, 2014). Statistics also support that this expansion has continued through last ten years as well; there were total number of 9,191 students in the open universities of applied sciences in the year 2010, whereas there were in 2019 already 39,659 students (Vipunen, 2021b).

Not only the demand of higher education has remained stable throughout last decades, but also constant expansion of the open higher education has been a strong trend. Young adults need higher education as means to educate themselves further and working people also need to educate themselves to keep their skills and knowledge updated. Thus, it is important to study higher education and especially open higher education. To enhance understanding of the past and present developments of Finnish higher education, the next chapter explores the aspects of how universities of applied sciences have developed into their current form.

# 2. Literature Review

## 2.1. Development of Universities of Applied Sciences

Historical background is important to cover to in this thesis, because through the historical background a comprehensive understanding about the current educational developments can be achieved. Universities of applied sciences were founded to expand the provision of higher education in Finland. Rinne and Salmi (1998) state that education has had a central role in building the Nordic welfare state model. Expansion of education and equality of education have been the foundation principles of future welfare state as guaranteeing welfare and reducing social inequality. The expansion of education has developed throughout the whole education system. From 1970s onwards the expansion concerned first the comprehensive school, thereafter upper secondary level education, and finally higher education. The expansion of education led to the founding of binary higher education when universities of applied sciences were established alongside the universities. (Rinne & Salmi, 1998; Kettunen et al, 2012; Finlex, 2003.)

First universities of applied sciences were founded almost simultaneously in Germany and in England at the end of 1960s. English universities of applied sciences were founded alongside of the universities as a more vocationally oriented alternative for universities. In Germany universities of applied sciences were founded to raise the education level of the highest technical and business degrees. At that time in Finland public discussion raised several issues concerning the need for educational expansion, such as growing concern about the country's competitiveness, the demand of qualified employees and how to educate growing number of secondary school graduates. The development of the educational laws was introduced in order to respond to the educational demands. Educational reforms were accomplished to provide academic education for one fifth of the age cohort. Another target was to balance regional demands for offering higher education in all the provinces throughout the country. (Lampinen & Savola, 1995.)

The content of higher education politics has always remained somewhat separate from the political discussion concerned with school education. The expansion of higher education, however, made the issue of equality of education and the development all the educational levels relevant. The idea was to remove dead ends in education. The lack of connections between

different school level education policies became critically relevant in 1970s when the number of high school graduates soared. Only when this problem occurred, the need to think education policies holistically became obvious. Development of accelerated the development of nationwide network of universities and by 1980s the current university system had shaped in its current form. Multiple study fields with their complex systems had to be integrated within the nationwide framework, such as teacher education and business education. (Lampinen & Savola, 1995.)

It became soon clear that the expansion of the university network was not alone enough to unravel the problem of growing need for higher education. Also offering a study place in either vocational education or in higher education after upper secondary school had been a policy objective from the beginning of the 1980s. In 1987, minister of education called for a discussion about the actions needed to unravel the problem with the growing number of high school graduates wanting to proceed their studies in higher education. A committee was set up to follow the development of educational policies and to come up with alternative solutions for the educational development. The committee visioned in 1988 that universities of applied sciences should be founded alongside universities to offer students a non-academic alternative for higher education. The vision was presented in 1989 in an educational policy seminar. Even though the dual higher education system was developed from the needs to educate growing number of people graduating from high school, it can be argued that regardless Finland would have needed to develop some kind of dual higher education system to adapt to the European Union educational system. (Lampinen & Savola, 1995.)

Finnish model for universities of applied sciences was created based on the work of civil servants during the year 1989. Political parties did not have much to offer but instead they accepted the model presented by the civil servants. Universities of applied sciences were not created from scratch, but instead there were several vocational institutes, and the target was to raise these vocational institutes educational level into the required standard of higher education. The development of universities of applied sciences started by trial periods in autumn 1991 when some institutions were given permissions to shift into universities of applied sciences and give out higher education degrees. Trial periods were necessary at the beginning because the political climate was not ready for founding permanent universities of applied sciences. In 1991 total of 22 institutions were granted permissions to found temporary universities of applied sciences. (Lampinen & Savola, 1995.)

During the following years the next development was the law about two cycle degrees in higher education accepted in 1994 and 1995. The idea of two cycle degrees cleared the division between universities and universities of applied sciences; first cycle degree became the dominant degree in the universities of applied sciences which prepared for the working life while in the universities the lower degree prepared for the continuing studying in the higher degree in the university. After the clarification of the degree structure, the political environment became more approbative for establishing permanent universities of applied sciences. Simultaneously with the law about two cycle degrees another law was prepared to make temporary universities of applied sciences into permanent higher education institutions. First permanent universities of applied sciences were established in 1995 when the educational institutions of Lahti, Häme, Tampere, Seinäjoki, Pohjois-Karjala, and Kajaani were granted the permanent permissions. In 1996 educational institutions of Kemi-Tornio, Mikkeli, Satakunta, Svenska Österbotten, Vantaa and Turku followed. (Lampinen & Savola, 1995.)

Founding of universities of applied sciences lead to a doubling the number of students studying in higher education. The increasing trend in the number of students continued until the year 2010, and since then the number has stabilized into around 300,000 higher education students. Even though the number is high compared to the total population, competition especially for the most popular study fields is tense. Tense competition is due to the fact that the same study places are competed by both those who just finished their upper secondary degree, and also all the others who are eligible to apply as well. The fundamental problem is that more students graduate from upper secondary school than there exist study places in higher education. In higher education the most recent development is that proportion of adults among applicants and students has increased considerably from 1990s onwards and this has in turn led to ever increasing competition of scarce study places. (Välimaa, 2018.)

Finnish higher education can be considered adult based on the analysis of the age structure of higher education students. Studying at higher education no longer occurs right after upper secondary level education by continuing studying full-time, but instead students with different ages and backgrounds study in higher education. Based on the age of the students and the degree-oriented education aimed at adults, it can be stated that universities of applied sciences in Finland offer genuinely a higher education degree for adults. At universities, the attitudes towards expanding opportunities for adult students seem still hesitant. Although universities have planned for adults their own study places for twenty years, the open question remains why the adult education leading to a university degree is still waiting to be realized. (Moore, 2011.)

Universities of applied sciences have established their place within the Finnish higher education system and the constant increase in the number of students indicates the need for constant expansion of the system. Additionally, the reform concerning the extension of compulsory education can lead to ever growing demand of higher education in the future. Thus, it is important to continue exploring the higher education system and its student selection. In the following chapter student selection in Finland and recent changes to it are explored further.

## 2.2. Changing student selection to higher education

### 2.2.1. The history of student selection to higher education

Universities of applied sciences were visioned as a way to reform the higher education system in Finland and that founding of universities of applied sciences would help with the issue of high number of students graduating from upper secondary school and seeking places in higher education. In 1993 a development plan of higher education was published by the government, and it stated that the whole generation should be provided upper secondary school education, meaning either high school or vocational school, and that 60 percent of age cohort should be reserved a place in higher education. Already in 1996, an agreement was made that higher education institutions will organize their student selection in a way that would lead first-time applicants to get study place faster than before, and that different applicant groups would be provided adequate possibilities to continue their studies. (Jussila, 1996.)

When temporary universities of applied sciences started operating in 1992 student selection to universities of applied sciences was made largely based on the joint application system. Joint application system at that time included not only temporary universities of applied sciences, but also high schools, part of folk high schools, and nearly all the education where the entry requirement was the completion of elementary school. The joint application system did not meet completely the needs of universities of applied sciences because the application system was created for another circumstances and to fill another target. Universities of applied sciences felt that they did not have enough control over the student selection and that their specific needs were not met in the joint system. One problem already occurring during that time was that students applied to several places and then cancelled the ones that they had been chosen after were accepted to some other place where they wanted to study more. (Jussila, 1996.)

Because of the problems faced in the early stage in the application system, the working committee set by the ministry of education suggested in 1993 that the motivation of the applicants and the suitability to the study field should be weighted more in the student selection for the universities of applied sciences. The working committee presented reforming the application system in a way that universities of applied sciences would have a joint application system among themselves, common access criteria, and national entrance exams for different study fields. Decisively student selection should be decided in each institution based on their preferred more exact criteria. Entrance criteria would be based on the success in previous studies, work experience, motivation and if necessary, the educational needs of an individual and the society. The working committee argued that universities of applied sciences can profile themselves by emphasizing their preferred criteria. The committee also suggested that further research is needed about the possibility of creating separate entrance methods for different applicant groups to add flexibility to the system. (Jussila, 1996.)

Jussila (1996) notes that higher education institutions started to pay more attention to the significance of the student selection in the 1990s. Performance management (such as employability and the number of graduates) had influenced to the increased use of motivation and suitability criteria. In addition, the introduction of efficiency goals for the educational institutions added pressure to use suitability criteria in the student selection process. This in turn led to the use of different criteria for different study fields. Around that time student selection to higher education started to become more complicated. (Jussila, 1996.)

Kosonen (2007) argues that the relevance of the science-based information as a basis for the student selection has varied throughout the last fifty decades in Finland. Bureaucratic approach to student selection gained power from the end of the 1960s onwards when the expansion of the welfare state was at its largest. At the 1970s there was a firm belief in the central planning and the joint application system for the secondary school was developed during that time. Simultaneously the relevance of scientific and specifically psychological expert knowledge begun to decrease and the seminars concerning the development of student selection process were centrally planned and organized. The criteria for student selection were set externally on the basis of educational policy and research data was forgotten in the justification for setting the criteria. This concerned not only the secondary school but also the universities of applied sciences. (Kosonen 2007.)

Kosonen (2007) criticizes that in the discussions about the student selection reforms research information does not seem to be relevant for the main actors making the decisions. She argues about the lack of culture which would pressurize the integration of scientific information into the discussion. It seems that every stakeholder can present their arguments about student selection without proper and deep knowledge about the issue. In the field of student selection, there is a lack of strong and respected scientific and expert authorities who could convincingly present and deliver first-hand expertise and research information for the media, for the decision-makers and for those who are planning student selection. (Kosonen, 2007.)

Kosonen (2007) points out that in order to be relevant, concepts and perceptions of student selection should, above all, describe accordingly different actors and their goals, aspirations, resources, and expectations, and conditions for the other party. The educational institutions targets are to choose students who are willing to adapt curriculums, who are able to graduate fast, and choose students who can become skilled professionals in their fields. The focus of student selection should be in those competencies that promote the possibilities of achieving the wanted goals. On one hand, fluent student selection process is significant to educational institution's success, but on the other hand, the credibility and comprehensibility of the entire selection procedure as well as the selection criteria and methods are essential for the applicant too. (Kosonen 2007.)

The history of student selection has not been straightforward, but instead it has been a combination of different interests and different perspectives into student selection. Historical development is something that is important to keep in mind when looking at the latest reforms, as those reforms try to respond to problems that have occurred in the history as well. Next, the latest reforms of student selection to higher education are explored.

### 2.2.2. Latest reforms of student selection to higher education

Few years ago, Ministry of Education and Culture had agreed with higher education institutions that by the year 2018, there would be a student selection reform in place that would not require any longer preparation from the applicants. Since the adaptation of the reform, higher education institutions have been required to select the majority of their students through diploma selection instead of previous field specific entrance exams. In addition, universities of applied sciences have introduced a joint entrance examination for all the fields and universities have increasingly

moved to joint entrance examinations inside one field. The contents of the entrance examinations have been transformed in a manner that they do no longer require long-term preparation. The diploma based selection has been reformed to favor first time applicants. These reforms were made with the aim of shortening study times and improving the opportunities for upper secondary graduates to get into higher education faster. (Ministry of Education and Culture, 2017.)

In the Ministry of Education and Culture's (2021) report a vision for Finnish higher education is presented and the target for the vision is year 2030. In the vision the biggest target is to raise the education and know-how level of Finnish population. By the 2030, more specific aims are that minimum 50 percent of the young adults would achieve a higher education degree, that continuous learning would be possible in different life situations and that the educational supply could be flexibly used among different users. Entrance related reforms in higher education are targeted to raise the education level of the population. The entrance to higher education in Finland has been reformed in many ways throughout the last ten years. Joint application has been introduced in 2015. First-time applicant quotas have been in use since 2016. Universities have abandoned the selection method of counting together entrance exam and the diploma points. Overall, the diploma choice has increased. All these reforms have raised discussion about the equality. So far there is not much research about the effects of the reforms. It is important to discuss how the accessibility can be enhanced through development of selection criteria and selection methods to higher education. (Kosunen, 2021.)

Even though the agreement was in place earlier, the actual reforms took place from 2019 onwards when first, in the autumn 2019 general entrance exam was introduced to universities of applied sciences instead of different entrance exams for different study fields and second, from 2020 onwards most of the students were chosen to study based on their upper secondary school diplomas. (Ammattikorkeakouluuun, 2021b.)

Haltia, Isopahkala-Bouret, and Jauhiainen (2019) have criticized these entrance related reforms. The higher education admission reform conducted in Finland in the 2010s is a reform that places adults pursuing a degree to the margin. Admissions policy delimits a typical student to a young upper secondary school graduate who applies to higher education straight after graduating and accepts the first place where the student is chosen. At the same time adult students are being marginalized into a position, where applying for degree studies does not seem to be a justified option. But this marginalizing of adult students can create a limited picture of options to

younger generations as well, implicating that once you have received the first study place, you do not have a right to pursue another career. (Haltia, Isopahkala-Bouret, & Jauhiainen, 2019.)

Karhunen, Pekkarinen, Suhonen, and Virkola (2021) have researched how the students search behavior has changed after the implementation of the higher education reform. As the aim of the student selection reform was to smooth the transition of upper secondary school graduates to higher education and increase the efficiency of the allocation of study places, it is hard to make any final conclusions about the reform yet. Still, already some data can be presented about the number of applicants. According to the authors fairly clear changes can be spotted in application behavior, which are in line with the expected effects of the reform. For example, in 2020 applicants applied for more study places than in previous years. This change was evident amongst the youngest applicants. Youngest applicants applied also to more study fields and to higher education institutions located further away from the applicant's home municipality. Because the diploma selection enhances the possibility to apply to multiple study places, these changes in the application behavior were expected. Another change observed in the data was that the growth in the average age of applicants who have received a study place seemed to be decelerating, as did the growth in the share of women accepted to the study places in higher education. (Karhunen, Pekkarinen, Suhonen, & Virkola, 2021.)

Despite of these changes in the recent behavior, one major problem still remains to be solved: the number of applicants turning down a received study place. On one hand the proportion of successful applicants clearly increased in 2020, and this change was particularly strong for universities of applied sciences. On the other hand, the proportion of those who received a place did not grow as strongly, as a larger proportion of applicants who had received an offer of a place to study did not accept the place. (Karhunen, Pekkarinen, Suhonen, & Virkola, 2021.)

The law governs the selection criteria quite loosely. It enables eligibility for higher education for graduates of various degrees. The aim is to avoid deadlocks in educational pathways and to promote access to higher education. When regulation is loose, a heterogeneous number of applicants can apply to higher education. The regulations require higher education institutions to have selection criteria that allow all eligible applicants to be ranked in equal terms. in terms of mutual ranking, regardless of the degree to which they are entitled. So far, the student selection has been a zero-sum game for higher education institutions because of the degree targets for each institution. (Kosunen, 2021.)

Earlier three routes to higher education have been dominant: firstly, the diploma selection, secondly the entrance exams, and thirdly the joint selection of diploma and entrance exam combined. Currently the first has been expanded and the third selection method has been abandoned. The student selection based on both the diploma selection and entrance exams are ways to create competition and to enhance the possibilities to stand out from the other applicants. The intense competition created by the student selection methods increase the pressure of students to succeed in not only in their earlier studies, but also in the entrance exams. (Kosunen, 2021.)

It remains to be seen who benefits from the reformed student selection most. The reform is aimed to improve the situation of upper secondary school graduates, and so far, the preliminary results indicate that the application behavior might have changed, but whether the goals set for the reform are achieved remains unclear. If the upper secondary school graduates become the winners of the reform, questions arise whether they are winning at the expense of adults who wish to enhance their life opportunities and to develop their skills further needed in the labor market and beyond. Lifelong learning goals have been important at the political speech level, but next it is time to look at what is the reality in the lifelong learning objectives and how they have been developed in Finland. Lifelong learning is important aspect for this research because it relates to the open higher education studies and adult students studying in higher education.

## 2.3. Lifelong learning

Lifelong learning is an important aspect of higher education and adults make up a significant portion of higher education students: in Finland, around 41 percent of adult population has a tertiary degree (OECD, 2019) and around half of the population aged 18 to 64 participate in some form of adult education (Official Statistics of Finland, 2017). Large proportion of adults participate into adult education, but still according to current government in their response to the report by Organisation for Economic Co-operation and Development (OECD) about Finnish education, there remains several challenges in developing the adult education system further. (Finnish Government, 2020.)

Main challenges of adult education system in Finland were identified as the lack of comprehensive strategy for continuous learning, the lack of options for vocational school

students wanting to continue their education, the incentives for all the students to participate only to degree leading education, which is not seen as necessary, the lack of education relevant for working life, and the stratification of education. Finnish government is currently preparing a reform to address these challenges identified by the OECD. One of the key challenges is how to offer targeted education for people in working life instead of them having to apply to degree leading education and thus reserving study places that younger students would need after completing upper secondary education. Extension of open higher education would be line with the need of offering versatile education for different groups. (Finnish Government, 2020.)

OECD has had important role from the beginning in the development of policies of lifelong learning. Lifelong learning policies have been developed throughout the last 60 years with different emphasis in different decades. Early in the 1960s, lifelong learning policies were considered as a wide concept, and it evolved from individual needs. United Nations Educational, Scientific and Cultural Organization (UNESCO) was at that time a champion for understanding the lifelong learning concept from individual perspective and enhancing more humanistic approach to the concept. This humanistic approach means that lifelong learning was seen as a way for individuals to develop themselves throughout their life and that this educational development of inviduals should be valuable in itself. However, since 1970s, the wider humanistic perspective started to fade away and the concept evolved into a narrower form, as its content was diminished into employability and responding to working life needs. Especially the Organisation for Economic Co-operation and Development (OECD) promoted this more economistic approach. Afterwards European Union (EU) has taken a role to promote lifelong long learning policies, but mainly from the narrow perspective. (Kazepov, Cefalo & Pot, 2020; Rubenson, 2009.)

In the 1990s, EU started to emphasize lifelong learning and the year 1996 was dedicated as a theme year of lifelong learning in the EU. Since then, lifelong learning has been used as a way to reform national education systems and as a way to respond the different economical and societal difficulties, such as high employment or low innovation rates. At the same time, the philosophical shift is turning more towards highlighting labor market needs and placing the responsibility of one's trainability to individual. (Volles, 2014.)

The same trend has been continuing ever since. Lifelong learning policies are still considered as tools to respond to economic and social structural problems. Nevertheless, the views of lifelong learning policies have raised discussion, as in these policies even though individual

responsibility is highlighted, citizens are still considered as passive replicators of education policies instead of being active actors. Lifelong learning policies have been considered also too wide and lacking the ability to respond to actual needs in specific contexts. (do Amaral, 2020.)

Criticism has also been presented towards the normativity of the concept of lifelong learning, as the model citizen norm is exclusive and not meeting the standards of an educated and employable citizen can have severe consequences for vulnerable people (Rinne, Silvennoinen, Järvinen, & Jenni Tikkanen, 2020). Furthermore, the individual responsibility can be criticized, as "for a lifelong learning subject of the neoliberal order, however, both success and failure are seen as dependent upon individual responsibility and up to the individual to bear" (Siivonen, 2016, p.48). This is an important point which illustrates the current neoliberal ideology of individual responsibility of being educated and employed.

In Finland, lifelong learning is considered holistically, as starting from early years and continuing throughout life, at least according to policy documents. Lifelong learning is being integrated to all education levels and the lifelong learning policy has three main principles: equity, flexibility and aim to educate the whole population in a high level. These policy principles are turned into action in curriculums and strategic plans, where some commonalities can be found throughout education system: "a readiness to continue studying in the next level, learning to learn consisting of increasing responsibility for one's own learning, and learners' personal growth" (Niemi & Isopahkala-Bouret, 2012, p.43). These policy principles again highlight the ideology behind lifelong learning and the constant need to educate oneself.

Koski and Filander (2013) present in their research the history of adult education in Finland. The ideology behind the changes in adult education have changed through history, but the purpose of adult education has been always the same: the main purpose of adult education is usually connected to economical needs, even though education has been justified from the perspective of individual development. Adult education has also been a way to promote citizenship and participation to the society. Not only the rationalization for the need to educate oneself was extended to whole population, but also same kind of ethos can be noticed from the current ethos of lifelong learning and enterprising individuals. (Koski & Filander, 2013.)

According to Kuusipalo, Toiviainen, and Pitkänen (2021) individuals who struggle to educate themselves are in a risk to be left out from the full participation to society. These individuals can have simultaneously multiple struggles that prevent them from participation to education and are in a risk to be marginalized in the society. Adult education systems in the Nordic welfare

states should promote the education of these individuals based on the humanistic traditions of adult education, but the trends of migration and marketization of education have been challenging for fulfilling the educational needs. The voices of marginalized are not loud in the market driven economy and education, even though educators are trying to advocate the needs of these people. (Kuusipalo, Toiviainen, & Pitkänen, 2021.)

Lifelong learning seems to form around belief of an individual as an object who is flexible and ready to respond to societies and working life's needs. The current lifelong learning discourse is formed around the idea that success in life relies much on the individual's willingness to educate, and that people have abilities to constantly educate themselves. For this research, consideration of aspects of lifelong learning is relevant for the reason that path studies route is important for adults seeking opportunities to develop themselves and to enhance lifelong learning further.

Higher education degree can be considered an important asset for individual to have in today's society that highlights lifelong learning and high level of education. Nevertheless, in order to successfully obtain a degree from higher education, several factors should be considered and these factors and how to measure study success are discussed next.

## 2.4. How to measure study success in higher education

The concept of study success is a central objective in this research. Despite the multiple dimensions of study success, in this research the concept of study success refers to the measurable aspects of study success. It is rather common to measure study success with numbers. For example, in the study by Pinxten, Van Soom, Peeters, De Laet, and Langie (2019), study success was measured by the credits obtained and weighted grade point average (GPA). Weighted grade point average means that average is calculated from the course grades, and that courses, which have more credits, weigh more in the calculation of the average grade. Also, Leinonen, Ihantola, Leinonen, Nygren, Kurhila, Luukkainen, and Hellas (2019) measured study success in their research by the credits obtained and the GPA of the subjects studied.

Even though GPA and credits are a common method to measure study success, different measurements for study success have also been used, such as graduation rates or dropout rates (Vlk, & Stiburek, 2018) or students' qualitative evaluation of their learning along with GPA

and credits obtained (Tynjälä, Salminen, Sutela, Nuutinen, & Pitkänen, 2005). Despite these other important dimensions, for feasibility reasons, this study only uses the GPA and the amount of credits to measure study success.

York, Gibson, and Rankin (2015) have combined different ways to measure academic success. A model is presented in the figure 3 on the next page. The model presents different ways that academic success can be measured and understood, such as for example acquisition of skills and competencies, satisfaction, or career success. Multidimensional phenomena like academic success can be examined from different perspectives, but for the reasons of feasibility, in this research the focus is on academic achievement containing GPA and credits. Even though academic achievement is only one dimension of academic success, it is most commonly used to measure academic success (York, Gibson, & Rankin, 2015).

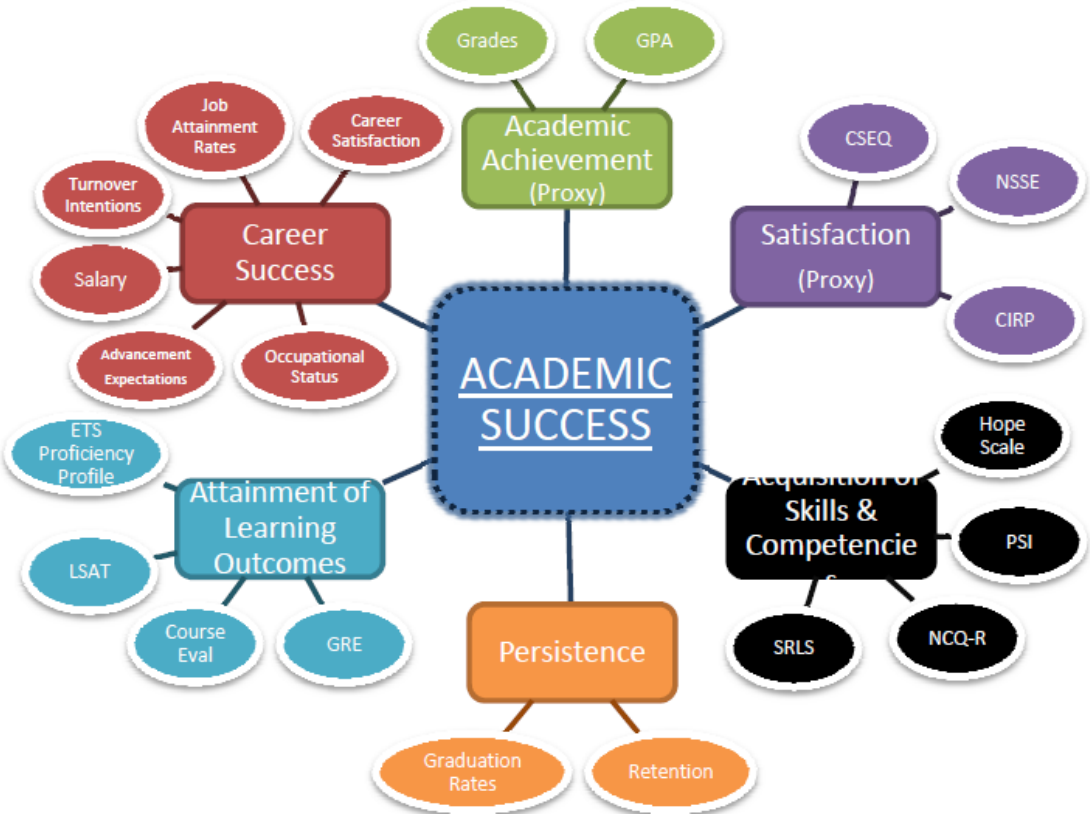


*Figure 3. The model of academic success. (York, Gibson, & Rankin, 2015, p.8)*

Multiple definitions of study success are concerning institutional perspective, and also in this research study success is looked at from institution's perspective. It is important to remember that different actors in educational field might have different understanding of what is

understood as study success. One often forgotten group is the students and what they think about how to define study success.

Cachia, Lynam, and Stock (2018) have researched students' understanding of academic success. In their study students defined study success as "the accomplishment of the learning process; gaining subject knowledge; and developing employability skills" (Cachia, Lynam, & Stock, 2018, pp.434). Researchers interviewed students and they found out that students thought that several intrinsic factors, such as self-management, motivation, personal skills, willingness to learn and development of personal skills, explain study success. Students thought that besides of intrinsic factors, also extrinsic factors, such as quality of teaching resources, staff availability and support available, explain much of study success. (Cachia, Lynam, & Stock, 2018.)

Asikainen, Parpala, Virtanen, and Lindblom-Ylänne (2013) question in their research the relevance of numerical assessments for courses as according to their research, course grades do not always reflect students' learning. Additionally, course grades emphasize superficial learning instead of deeper learning. Current assessment methods do not help students to improve their learning methods and thus improve the learning outcomes. Researchers point out that success in studies could be enhanced by better time management skills and organizational skills and that universities should assist students in developing these skills instead of focusing only on numerical assessments. *(*Asikainen, Parpala, Virtanen, & Lindblom-Ylänne, 2013.)

Guterman (2020) also questions the use of grades for measuring success in higher education. Instead, he suggests that there should be three different frames to measure success: external criteria, normative frames of reference and self-reference. He acknowledges that the last one, self-reference, is often ignored in the assessment, but he criticizes that the self-reference might actually be the most relevant, because all students have different starting points and goals for courses and whether the course is successful in student's perspective depends on whether individual goals for the course are achieved. Guterman suggests that there should be a framework to measure individual achievements as well, and not only external or normative frameworks for assessments. (Guterman, 2020.)

It can be concluded that measuring academic achievement is a complex matter and the matter can look quite different from students' point of view if we compare it the institutions' point of view. Figure 3 on the previous page collects together multiple perspectives that can be found in the academic literature. Numerical ways to evaluate study success are only a small proportion

of all the possible ways to measure study success, but as mentioned earlier, in terms of feasibility, this study contains only few of these, as credits and GPA are the variables that were possible to include in this study. Credits and grade point average are important variables to measure study success, but what affects to these variables is the actual question in this research. In the following chapter the different factors affecting to study success and academic achievement are distinguished.

## 2.5. Factors explaining study success in higher education

Study success is an outcome, which is determined by multiple factors. For example, one factor is student and student's background. A study was recently conducted about the study success of students with the background in open higher education. The study was conducted at the University of Helsinki. In the study, the students with a background in Massive Open Online Course (MOOC) were compared with the students with a background in joint application. These two groups and success in their studies were compared. According to the study, students with a background in MOOC did better in their main subject studies than students with the joint application background. (Leinonen et al., 2019.)

According to another study in Finland, the students with background in MOOC performed at least as well in their studies as the students with a background of joint application and besides the students with a background in MOOC had lower drop out levels during their first year of study (Vihavainen, Luukkainen, & Kurhila, 2013). These studies mentioned above suggest that studying at the open higher education could be beneficial in terms of later study success at the degree level and that this is an important subject to do further research.

The goal of this master's thesis is to broaden the knowledge of the study success and factors affecting it by conducting a study about the study success of path studies students compared with joint application students at the degree level in the University of Applied Sciences in Finland. The possible effect of path studies to the later study success at the Universities of applied sciences has not been researched yet in Finland, so that is an important reason for this research to be done.

Numerous studies have been conducted about the different factors explaining the study success in higher education. For example, Häkkinen (2004) highlights in her study that admission

related factors could predict academic performance. Her study showed that students, who performed better in the entrance exam, also had more credits after four years of examination. Furthermore, she explains that according to the results "senior secondary school GPA is a good predictor of study credits at university in all fields, but matriculation exam grades are mostly insignificant and even negative" (Häkkinen, 2004, p. 23). In other words, the best predictors of study success would be the upper secondary school GPA and entrance exam results.

In addition, in another study conducted in Sweden, the GPA of upper secondary school and the results of Swedish Scholastic Aptitude test (SWESAT) were compared and examined if they explained the study success at the higher education. The study success was measured by the accumulated credits. The results of the research are that GPA had stronger validity in explaining the study success than SWESAT. (Cliffordson, 2008.) It seems that entrance exams do not predict in every case later study success in higher education.

Mills, Heyworth, Rosenwax, Carr, and Rosenberg (2009) discovered in their research that study success was enhanced particularly by high matriculation scores and first year marks. High matriculation scores predicted first year study success whereas first year remarks predicted later study success in higher education. Furthermore, females performed better than males during their first years of studies. (Mills, Heyworth, Rosenwax, Carr, & Rosenberg, 2009.)

In a study by Pinxten et al. (2019), the explaining factors of study success of university students included the subject GPA in secondary school, and also student's motivation, concentration, and time management skills. Similarly, in a study by Haarala-Muhonen, Ruohoniemi, Parpala, Komulainen, and Lindblom-Ylänne (2017), students study success was explained by differences in study skills, such as awareness of study practices, and organizational and time management skills. The success at secondary school or entrance exams is not then the only factor defining study success at higher education. In fact, other studies have shown that factors affecting study success can be understood as a combination of verbal skills, prior knowledge, academic adjustment, and low degree of involvement to the university (Fastre, Gijselaers, & Segers, 2008) or by a difference in students' study strategies (Tynjälä et. al., 2005).

According to a study by Korhonen and Rautopuro (2019), who examined university students' risk of not completing their studies, students' study field, age when starting studies, and the duration of studies are significantly associated with the risk of not completing studies. For the fields of information technology, mathematics and sciences field were related with higher risk

of not completing studies, whereas the lowest risks were in the fields of education and economics. Gender alone did not have effect but combined with the study field, there were significant differences: in ICT, males were more at risk of not completing their studies, whereas females in IT had significantly lower risk. Student's higher age when starting their studies was also significantly related to the risk of not completing studies. (Korhonen & Rautopuro, 2019.)

This risk of not completing studies could be perceived as a problem, especially from institutional perspective, but students' own views of their studies can differ. Students might have other priorities in their lives besides of studying, students can consider their studies as a steppingstone for other fields of study, or the motivation for studying is something else than to achieve a degree in the first place. Thus, the risk of not completing studies is not necessarily as negative when considering individual factors. From the institutional view, the importance of offering guidance and arranging flexible ways to study can be emphasized in order to support those students who are at risk of not completing their studies. (Korhonen & Rautopuro, 2019.)

In a Dutch study by Muriel Van den Berg and Adriaan Hofman (2005), healthcare and agricultural sectors stood out as approximately 78%-83% of the students achieved master's diploma, whereas in law, language, and culture studies the graduation rates were below average with approximately 50%-57% of students graduating. In the study, women were slightly more successful than men were and belonging to an ethnic minority was predictor of lower study progress. Age had such an effect that the older the students were, the more slowly they progressed in their studies. Study also indicated that prior experience in higher education had significant effect to study success. Time spent on studies was related to study success as well; the more time is spent on studies, the more likely it is to succeed in studies. Having a job alongside of studies had no have an effect to studies, if the hours spent on working were less than 8 hours, but if students worked more than 12 hours it had significant effect as a slower study progress. (Van den Berg & Hofman, 2005.)

In a study by Dollinger, Matyja, and Huber (2008) both controllable and uncontrollable factors related to student were studied in terms of how they relate to study success. In the study it was concluded that uncontrollable factors, such as abilities and past performance explained 37% of the variance in study success whereas controllable factors, such as attendance and hours of study, explained 6-10% of study success. (Dollinger, Matyja, & Huber, 2008.) In another study by Kappe and Van Der Flier (2012) similar results were found. Their results show that around third of variances in GPA and graduation time in higher education can be explained by personal

features, for example intelligence and inner motivation. They recommend that higher education institutions should consider gathering data about personality and help students according to data. (Kappe & Van Der Flier, 2012.)

In different studies different factors have contributed to the outcome of study success. For example, student's background in open university had positive effect on later study success. Also study fields were related to study success or to the risk of dropout, which are interesting observations considering this thesis. In several studies uncontrollable factors related to the individual explained around third of the study success. Nevertheless, study skills explain some part of study success, such as time management skills, studying strategies, and time spent on studying. Because the personal features seem to affect more on study success than only study skills, they are important factors to be included when analyzing what affects to study success. In the following chapter more detailed theoretical background of study success is presented.

## 2.6. Further theoretical considerations on study success

Considering the previous literature no one exhaustive factor is explaining study success in higher education. Nonetheless, Määttä and Uusiautti (2018) have developed a model where they collect the different factors explaining the study success of higher education students to a figure presented at Figure 4 (Määttä & Uusiautti, 2018, p.20.) In this study, the possible differences between the results would be explained by the individual factors concerning the student.

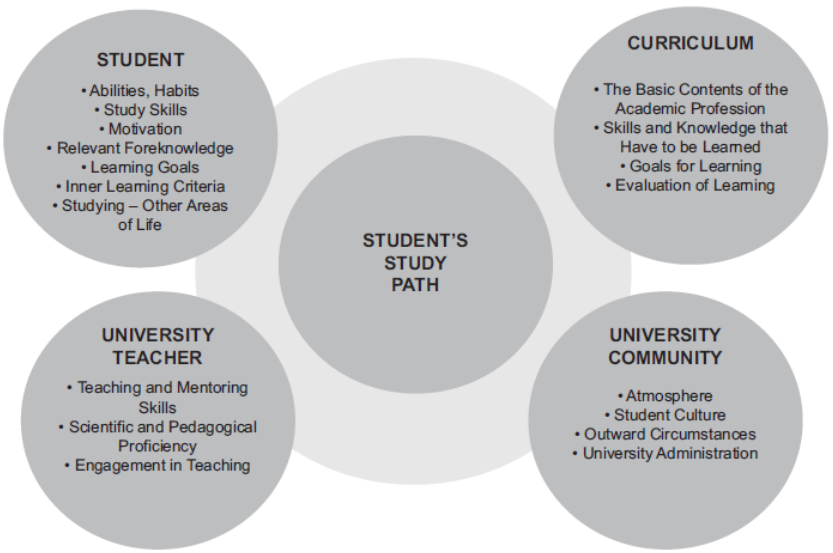

*Figure 4. Factors explaining study success of higher education students. Note. Reprinted from "The Psychology of Study Success in Universities" (p. 20) by K. Määttä and S. Uusiautti, 2018, Taylor & Francis. Copyright 2018 by Kaarina Määttä.*

In their book Kaarina Määttä and Satu Uusiautti (2018) explain that study success in university is founded on four elements: student, university teacher, curriculum, and university community. Figure 4 above illustrates these four core elements for university students' successful study path. Researchers point out that the most important of these four core elements is the student. The individual factors related to student include for example student's abilities and habits, which means student's learning history and self-efficacy gained by previous learning experiences. Another component of student is studying skills, which means that student has developed a certain style of learning and attitude towards learning. Motivation is another crucial factor for study success, since students who want to perform well in their studies usually also perform better. On one hand, if student has intrinsic motivation, it can help students to overcome obstacles in their studies, but on the other hand external rewards can be motivating factors for some students as well. Relevant foreknowledge is related to students' abilities to set expectations and perceptions about studies. Learning goals can help students to achieve both short- and long-term goals and plans related to studying. Another important factors of study success are students' inner criteria for learning and how students manage to combine studies with other areas of life. (Määttä & Uusiautti, 2018.)

Study success contains three other dimensions besides of the student; university teacher, curriculum, and the university community. Skilled teachers can enhance students' interest in their studies, whereas the university community can offer support and meaningful interactions. A well-designed curriculum can set clear learning goals and aim at improving students' knowledge and skills in a meaningful way. (Määttä & Uusiautti, 2018.)

A lot of individual factors can be explaining the study success, but in this research, not all of them can be covered. Thus, the focus will be on the student and specifically on student's background in terms of abilities and habits, relevant foreknowledge, and learning goals. As Määttä and Uusiautti (2018) emphasize in their research, the student is ultimately the person who either learns or not and thus study success is dependent on the individual student. In their research, students described that the factors that hindered their progress in studies were inadequate studying skills, low level of adjustment to academic studies, unclear directions for courses

and how to write learning tasks, perceiving how to make realistic study plans, lack of guidance, lack of community support, and overlapping courses.

Määttä and Uusiautti (2018) also described in their research what enhanced study success. According to students in their research, positive experiences of studying were crucial for study success. For example, succeeding in difficult tasks or passing difficult courses were related to students feeling of success. Thus, it seems that even from the student perspective good grades can be meaningful in terms of study success. Students felt also that studying itself can be motivating. Other important factors for study success were good relationships with others, and university atmosphere. In the research it was mentioned that small university meant open, encouraging, and relaxed atmosphere which students enjoyed. Also, flexibility of studies, practical trainings, teachers and their motivation, and the feedback given by the teachers were important factors for study success for students. (Määttä & Uusiautti, 2018.)

Even though four elements of study success are all crucial, in this research the focus is on the student and factors related to student. Even though theory presented in this chapter concerns university students, the concepts are universal and can be adapted to universities of applied sciences as well. Two most important variables in this study are student's background in open higher education and study field where student studies. The first one is connected to mainly student, but student's study field is related to not only the student but also the curriculum, teacher, and the university.

For the student's background in open higher education, participating into open higher education can be seen as a way for student to set expectations for studies and increase self-efficacy because participating to open higher education gives students a chance to get to know to higher education institutions and practice their study skills before trying to pursuit a degree. Path studies are one way of getting to know the desired study field in the universities of applied sciences. Even though path studies and degree students in the universities of applied sciences study together for the first year, if the students of path studies wish to pursue a degree, they must achieve certain number of credits after the first year of studies to be qualified to apply for the degree studies. Thus, succeeding in this first phase and being able to continue, as a degree student can be motivating for path students. The interest of this study is to examine how the two groups with different backgrounds success in their studies over a longer period and hence to find out if the path studies can be an important background factor when comparing study success.

In the study by Nina Haltia, Leena Leskinen, and Esa Rahiala (2014), the profiles of the open higher education students were examined. In their study, it was shown that students in both open university and open university of applied sciences aim primary for professional development. Another important motive to participate to open higher education was self-development and this was an important motive specifically for elderly retired students. Career change was in plan more for the open university of applied sciences students than for the open university students. The younger the students were, the more clearly their motivation was prepared to entrance exams and applying via the joint application route. Those who wanted to apply via separate route, were a diverse group for their age and background. Applicants of separate route were usually adults already in the working life wishing to change their career and raise their level of education. Students applying via joint application route were instead younger and full-time students, who were motivated by getting to know their subject of interest. It seems that fewer young students are pursuing their first degree in the open higher education, but instead the adults' degree pursuing is becoming more common. (Haltia, Leskinen, & Rahiala, 2014.)

Outi Jalkanen (2007) also studied the study paths of the students studying in open universities of applied sciences and has found similar results. The main motivations behind participating to open university of applied sciences education were because studies were interesting, and they enabled self-development. Important reason for participation was also that studies could be incorporated into a degree. Older students' motivations for participation were more related to their career development, whereas younger students' motivations were related to the personal interest towards the study field. Many of these younger students might not have been accepted in the general admission route, so they wanted to pursue their studies in open university of applied sciences. Over 33 years old students who had some higher education background had less time available to be spent on studies than younger students who were under 25 years old. The limited time available for studying was in the study the most common factor that students reported to affect their studies negatively. The most common factor that affected studies positively was the motivation towards studies. (Jalkanen, 2007.)

It seems clear that motivation is a crucial factor when considering study progress and study success in higher education. Professional development and self-development can be seen as important factors motivating older students and general interest towards the study field is something that motivates younger students. Even though different groups of students have

different motivations to study in higher education, it seems that motivation in general is important for succeeding in studies.

Based on previous literature individual aspects such as motivation, age, gender, and study field can all have their effect on study success. Even though motivation cannot be directly included to this study, one variable is student's background in path studies and going through a path to degree studies via path studies route can be considered to measure motivation of students to proceed from one phase to another. Path studies can be thought of increasing student's self-efficacy and studying skills as well.

The visit to the literature on study success shows that the success depends on a large number of factors. Acknowledging these factors, this thesis concentrates on factors of path studies background and study field. As mentioned earlier, study field can make a difference to study success and thus, it is also interesting factor to include to this study. To keep the thesis feasible, other factors are not included in this study as explaining factors of study success. In the following chapter research questions and subquestions of those research questions are presented in order to explore the study success at the level of university of applied sciences.

# 3. Research objectives and methodology

## 3.1. Research objectives and questions

In this research the research objectives are to find out more about study success at universities of applied sciences. No similar studies have been conducted in Finland so far, so the aim of this research is to bring more information about whether the background in path studies or the study field has an effect to the study success of students at universities of applied sciences. Even though study success is a complicated issue and there are many different ways to measure it, this research tries to examine study success of certain groups with the help of quantitative methods. Thus, study success is measured in this study by weighted grade point average and amount of credits.

The research questions are defined in order to find out about the study success of certain groups studying in the Turku University of Applied Sciences. This thesis focuses on the comparison between students of path studies background and joint application background and their respective study success The interest of the first question is if students' background in path studies can explain the possible variations in study success.

Study field could be one factor affecting to study success in higher education and thus it is included also in this study. For the second question, possible variations between the study successes of different study fields are measured to find out if some study fields vary from each other in terms of study success.

Research question 1: Are there differences between study successes of students with a background in path studies compared with students with a background in joint application?

- Subquestion: What is the estimated size of effect for differences?

Research question 2: Are there differences in different study fields' students and their study success?

- Subquestion: What is the estimated size of effect for differences?

For the quantitative research it is common that hypothesis is formed to answer to the research question. Hypotheses should always relate to previous research, theories, or models and those kinds of hypotheses are theoretical hypotheses. Hypotheses are always justified. Hypothesis is used in explanatory and comparative research, but in descriptive or experimental research the use of hypothesis is not necessary. Hypothesis depicts beforehand what kind of results are expected from the analysis and what might be the explanations. (Vilkka, 2007.)

The first research question and subquestion for it includes a comparison between two different student groups: students with path studies background and students without path studies background. Based on the previous literature, it could be assumed that open higher education might have an effect to study success, but it has to be acknowledged that those previous studies have concerned university students. There is no similar research about the students at universities of applied sciences and whether there path studies affect to the later study success in degree studies. As Määttä and Uusiautti (2018) present in their study, individual factors, such as relevant foreknowledge and motivation, have an effect to study success in the university, but it remains to be seen whether the case is true also for the students at universities of applied sciences.

The second research question and subquestion for it includes a comparison between study success of students of different study fields. For the second research question the literature suggests that study field could have an effect to study success again at least in the university level. On one hand IT and science related fields had higher risks of dropouts and on another hand healthcare and agricultural fields had high graduation rates. But these were studies at university level and thus, it cannot be generalized as such to universities of applied sciences. For both research questions it could be concluded that the hypotheses are that there would be a difference in both cases according to the previous literature, but results can show differences between universities and universities of applied sciences as well. Notwithstanding, quantitative research about the study success at universities of applied sciences seems to be necessary and this research aims to fill this gap. Next, more thorough information about the sample and data collection are presented.

## 3.2. Population and data collection

Generally, population is larger group where the sample is chosen from. Population is the group that contains all the units that want to be included in the study. Sample is the number of units that are actually included in the study. (Vilkka, 2007.). As the commissioner of this thesis is Turku University of Applied Sciences, the population for this research is the degree students at Turku University of Applied Sciences and specifically Finnish degree students. English degree students are excluded from this study because their overall number is smaller than Finnish students are and because the number of dropouts in English degree studies are higher than in Finnish studies and this might have an effect to results.

In addition, the study fields where there are no path students at all, such as humanistic study fields are excluded from the study, because the focus is on the path studies, and it would not make sense to include study fields that do not have path students. Humanistic study fields are not large study fields in the University of Turku, so the limitation is not significant.

For those Finnish degree students who study in such study fields where there are both joint-application students and path students, the aim is to compare their study success based on the two different backgrounds, joint application, or path studies. Path studies have been conducted at the Turku University of Applied Sciences from autumn 2016 onwards, but in autumn 2016 (only 26 path students) and in spring 2017 (only 24 path students) the number of path students has been so small, that they are excluded from the study. That is why the population is limited to the students who started their studies from the autumn 2017 to students who started their studies 2019 spring. Limitation to 2019 spring is necessary, because students who started 2019 autumn onwards have not progressed in their studies so far in the time of the data gathering, that it would be meaningful to make analysis about their study success. As the population in this research is the Finnish degree students in the Turku university of applied sciences, the sample in this research is the students of certain study fields who started their studies between autumn semester 2017 and spring semester 2019.

Total four semesters were included in the study because the inclusion of several semesters into the study will strengthen the generalizability of the results. Data was also readily organized in semesters, and thus it was easier to collect. Data has been collected in the following groups: students who started their studies in the autumn semester 2017, students who started their

studies in the spring semester 2018, students who started their studies in the autumn semester 2018, and students who started their studies in the spring semester 2019.

A benefit of choosing semesters mentioned above as a sample is that the entrance criteria for the joint-application route to University of Applied Sciences has remained rather similar throughout these semesters, with emphasis on choosing students either directly based on secondary education diplomas or with the combination of diploma and entrance exam score rather than choosing students merely based on the result of entrance exams. Even though the emphasis has been on diplomas, entrance exams have had an important role in the student selection process. (Arene 2018, 2017a, & 2017b.)

Data has been collected from a data that is readily available at the Turku University of Applied Sciences information system. Data is official student register data. The collection of data started in March 2021 after obtaining the necessary research permits and agreements to collect the data. Data collection was a slow process, as the data had to be gathered together from different tables and different places from the student register into one table. Data collection finished in June 2021.

The data has been collected from the information system and then transferred into an excel table. In excel tables data was then modified into suitable variables. After checking the editions carefully, edited excel tables were transferred to the analysis program. The analysis has been done in the SPSS program, version 26, and version 27, as the program has had some updates throughout the year. Analysis of the data has been done during the summer 2021. Analysis is done separately for groups of students who began their studies at different semesters (2017 autumn, 2018 spring, 2018 autumn and 2019 spring). Analysis is done for each semester based on the variables that are presented in the next chapter.

### 3.3. Variables

Variables in this study are based both on the literature and the information needs of Turku University of Applied sciences. One of two main variables for the analysis is the background of student, whether students have background in path studies or not. Students who have entered to degree studies as via the path studies route could be identified at the data collection phase and thus, they were easy to categorize in the later analyzing phase.

Other individual characteristics concerning students, such as gender and age, are included to the basic statistics. Including gender is rather simple, but including age is more problematic, because age can be considered as an identifying factor and in order to maintain the anonymity in data, age is modified as forming age groups from the data. Thus, the age groups are formed as following; students born in the year 1984 or before, students born during 1985-1989, students born during 1990-1994 and students born 1995 or after.

Similar problem applies to major of the student; for some majors there are only few students and major could then be exposing factor to identification. Thus, the groupings of majors into study fields are made to ensure the anonymity of the students and it also has the benefit of forming larger groups for data analysis. Turku University of Applied Sciences uses the classification described in the Figure 5, as broader study fields.

| |
|---|
| Arts and cultural fields, educational fields, social sciences |
| Business, Administration and Law and Services |
| Natural sciences, data processing and telecommunications, engineering, agriculture, and forestry |
| Humanities, medicine, health, and welfare |

*Figure 5. Original study fields at the Turku University of Applied Sciences.*

Arts and cultural fields, educational fields and social sciences combined is a marginal study field in the Turku University of Applied Sciences and the field has barely any path students. That is why that category is left out from this study. By far the largest study field is the third and that is why it is divided into two: natural sciences and engineering as one study field and data processing and telecommunications as another. After these modifications study fields are divided into four new categories, as described in the Figure 6.

| |
|---|
| Study field 1: Business, Administration and Law and Services |
| Study field 2: Natural sciences, engineering, agriculture, and forestry |
| Study field 3: Data processing and telecommunications |
| Study field 4: Humanities, medicine, health, and welfare |

*Figure 6. Modified study field at the Turku University of Applied Sciences.*

After making necessary modifications to the variables, the variables included in the study are presented in the Figure 7. The main categorical variable is path studies and whether the student has a background in them or not. Another central variable in this study is the students' study field. The categorization for it has been described earlier in this chapter. Age and gender are also categorical variables included in this study as background information, but they are not included to the actual research questions. Numerical variables included in this study are the amount of credits and weighted grade point averages on a scale 0 to 5. Weighted grade point average means for example that a course that has ten credits has more weight than course that has only two credits and those weighted calculations are done automatically in the student information system. Amount of credits measures the total amount of credits that the students have achieved since the beginning of their studies.

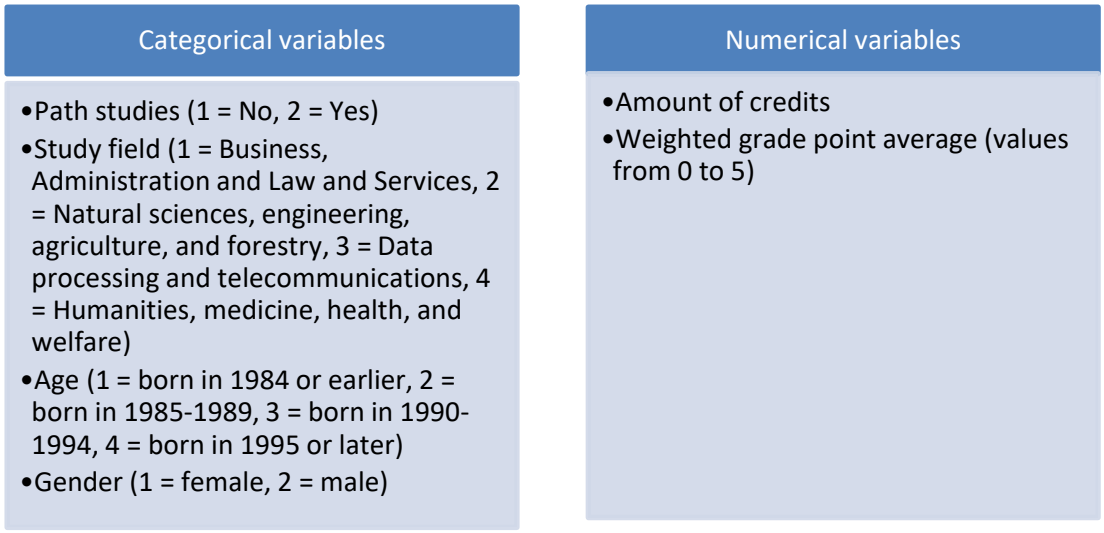


*Figure 7. Variables.*

## 3.4. Methods

Purpose of quantitative research can be understood not only as describing and explaining the phenomena under investigation, but also understanding the phenomena, which is as a process usually linked to qualitative research. Even though phenomena of educational sciences are complex, statistical research can be relevant when the results are interpreted within the theoretical frameworks and the context of previous research. (Tähtinen, Laakkonen & Broberg, 2020.) Quantitative research is a process that aims to find some regularity in the data and explain it with the help of previous literature or theories (Vilkka, 2007).

This study aims to build on the existing literature concerning study success but at the same time providing new information about path studies. Quantitative methods are suitable methods to measure study success, because the variables of GPA and credits are measured in numbers. Other variables included in this study could also be edited as suitable for analysis.

Because the purpose of this study is to make comparisons between two groups, the method was chosen accordingly. For the first research question the aim is to make comparisons about the averages between two groups. The dependent variables are the grade point average and the number of credits. The independent variable is the student's background, whether the student has a background in path studies or joint application. T-test could be suitable to be used as an analysis method because it is used to test the differences between two groups average values. T-test requires normal distribution among the comparable groups. If the groups are not normally distributed, the nonparametric counterpart for t-test is Mann-Whitney's U-test. (Tähtinen, Laakkonen, & Broberg, 2020.)

Mann-Whitney U-test is based on ordinal numbers and it compares the medians of the categories of the variable. The U-test can be used instead of the t-test for independent samples when the t-test assumptions are not valid. The null hypothesis of the U-test is that the distributions of the order numbers of the variables are similar. According to the alternative hypothesis, the distributions are different. The lower the observed significance level of the U-test, the more likely the distributions are different. (Nummenmaa, 2009.)

To decide whether to use parametric methods or nonparametric methods, normal distributions of the data are always measured. Most common tests to measure normal distributions are Kolmogorov-Smirnov test and Shapiro-Wilk test. Both tests test the null hypothesis, which is

that the variable tested is normally distributed. Alternative hypothesis is that the population distribution is not normally distributed. Usually, it is considered that distributions are normal is the significance level is large than .05. Besides of using tests for normal distributions, it is always good to check the distribution of the data with the help of descriptive statistics (Nummenmaa, 2009).

For the second research question the aim is to make comparisons about the averages between four groups. The four groups are the different study fields of the path studies students. The study field would then be the independent variable and the dependent variables would be again the grade point average and number of credits obtained. Analysis of variance could be suitable method of analysis for the second research question, because it involves more than two groups and their average values. If the analyzable groups are not normally distributed, then the nonparametric counterpart for analysis of variance is Kruskal-Wallis test. (Tähtinen, Laakkonen, & Broberg, 2020.)

The Kruskal-Wallis test can be used instead of one-way analysis of variance if the assumptions of analysis of variance are not valid or if the variables are measured on an order scale. The null hypothesis of the Kruskal-Wallis test is that the medians of two or more sequence number distributions are equal. An alternative hypothesis is that the medians of the distributions differ from each other. The lower the observed significance level of the Kruskal-Wallis test, the more likely the distributions are different. The Kruskal-Wallis test works in exactly the same way as the Mann-Whitney U test, except that there may be more than two comparable distributions. In the Kruskal-Wallis test, the combined observational data are placed in order of magnitude, and then the sum of the order numbers in each group under consideration is calculated. (Nummenmaa, 2009.)

For both research questions the idea is to also calculate the size of effect. Size of effect indicates the strength of the phenomena in population. By defining the effect size, we can decide whether the observed phenomenon is so large that it would have any practical significance and by looking at the effect sizes, we can estimate the magnitude of the observed phenomenon regardless of the sample size. Thus, effect sizes also facilitate comparisons between studies with different sample sizes. When sample size is bigger, it is more likely to resemble the population, as the standard error is reduced. When sample is smaller, it is more likely that sampling error will affect to the results. This is why in small samples the size of effect should be considerably big, so that it would be statistically significant. (Nummenmaa, 2009.)

The effect size can be defined and calculated in several ways, but typically it is a numerical estimate independent of the sample size that tells how much of the variation in the dependent variable can be explained by the independent variable. The simplest estimate of the effect size is the so-called Cohen's d. It can be calculated if two groups are compared, for example an experimental and a control group. Cohen's d expresses the magnitude of the effect as the standardized difference of the group means. The small effect is 0.2, medium 0.5 and large 0.8. But these are only indicators and can be interpreted differently in different research contexts. (Nummenmaa, 2009.) In this research the first research question's subquestion is analyzed with Cohen's d effect size.

When the idea is to compare more than two groups, another method has to be used to calculate size of effect. In this research, a method of eta squared is used to calculate the size of effect for the second research question. Eta squared is a typical method to be is used when calculating size of effect for analysis of variance and for the eta squared small effect is 0.01, medium effect is 0.06 and large effect is 0.14 (Tähtinen, Laakkonen, & Broberg, 2020).

In the results chapter the normal distributions are first measured in order to decide with what analysis method is suitable for analyzing the data each semester. In addition, after the analysis of the first and second research questions, size of effects are calculated to answer the subquestions. Size of effect is important as subquestion because it tells about the strength of the phenomena and thus it increases the reliability of the interpretation of the results. In the following chapter the issues of reliability and reliability in the context of this research are discussed further.

## 3.5. Evaluation of trustworthiness of the study

When considering trustworthiness of a study, reliability and validity are key concepts in evaluating trustworthiness. Together validity and reliability form dependability (Vilkka, 2007). Reliability in research means that measurements are reliable. Reliability in research means that it gives non-random results. Reliability can be stated in several ways. For example, if two researchers end up to same result, the result can be considered to be reliable or if one person is examined twice and both times give similar results, the result can be considered to be reliable.

Another important aspect to evaluate in research is validity. Validity means that research measures exactly what it is supposed to measure. (Hirsjärvi, Remes, & Sajavaara, 2009.)

Validity roughly means the absence of a systematic error. Measurements made with a valid meter are, on average, correct. If the concepts and variables to be measured are not precisely defined, the measurement results cannot be valid either. Validity is difficult to look at in retrospect. It must be ensured in advance by careful planning and carefully considered data collection. Precise definition of the population, obtaining a representative sample and a high response rate also contribute to the implementation of a valid study. (Heikkilä, 2014.)

The basis for this study is an official statistical data that already exists in the Turku university of applied sciences study register so the data should be rather reliable. There is no data missing as all the data used in this study has been originally recorded in the study register. To make sure that in this study the data remains as reliable as possible, all the editing made to data before analyzing is reported. It should be possible to replicate the research if having access to the data and making the same editions to the data as in this study. For reliability reasons in this research all the steps have been described carefully, as is recommended for example by Hirsjärvi, Remes, and Sajavaara (2009).

Reliability refers to the accuracy of the results. The results of the study must not be random. Scientific results should not be generalized outside their scope. Due to the diversity and variability of society, the results of one study may not be valid in another time or in another society. The researcher must be accurate and critical at all times. Errors can occur in data collection, input, processing, and interpretation of results. Results can be random if the sample size is very small. Especially in surveys, it is worth considering the sometimes-large drop-out rate, which means the number of those who did not return the form. In order to obtain reliable results, it must also be ensured that the target group is not skewed, but that the sample is representative of the entire population to be examined. (Heikkilä, 2014.)

In this research, the population includes the whole population of degree students studying in Finnish degree programmes in those fields that have study paths in the Turku University of Applied Sciences. The variables that are included in this study are based on official data of student records, which means that no missing values should exist in the data, and this can be considered a good thing for reliability and representativeness of the data.

When considering how to improve the overall dependability of the research, for example following questions can be pondered; whether the research actually examines what it is supposed to, whether the population is defined carefully and the sample is chosen accordingly, whether the data collection method is appropriate, whether the analysis method is suitable. Besides, it should be checked that all the data is included into the study and that the measurable objects are as specific as possible. (Vilkka, 2007.)

The above-mentioned issues are all considered during the process of making this thesis. After clarification of the purpose of the research, the focus in this research was to define what would be the population (and the sample), what would be the actual research questions and what would be the best methods for analyzing them. Before starting the actual research process, it had to be assessed how the data collection could be organized. In the end, data collection was done with a computer given by the Turku University of Applied Sciences so that data collection, processing, and analysis would be done with safe connection to the databases. Before starting the actual data collection there were necessary research permits signed to ensure the data use for research purposes only. In order to ensure the anonymity of the data, after searching the data, it was edited and only information which does not contain any personal identifiable information was then saved for later analysis and for the research report. From the report it should not be possible to identify any students. In the next chapter it is time to look at the results of the data analysis starting with the descriptive statistics and then going through the more specific results of the analysis.

# 4. Results

## 4.1. Descriptive statistics

At first it is important to look at some descriptive statistics of the data to get an overall picture of the data. Descriptive statistics are gathered to a table below, which shows percentages and N numbers for each semester separately combined with the variables that are explained in the chapter 3.2. in this research.

| **Semester** | **Autumn 2017** | **Spring 2018** | **Autumn 2018** | **Spring 2019** |
|---|---|---|---|---|
| **N** | 780 | 179 | 1357 | 339 |
| **Background** | | | | |
| - No path studies | 96,5% | 90,5% | 91,7% | 89,4% |
| - Path studies | 3,5% | 9,5% | 8,3% | 10,6% |
| **Gender** | | | | |
| - Female | 31,2% | 56,4% | 48,1% | 70,8% |
| - Male | 68,8% | 43,6% | 51,9% | 29,2 % |
| **Age group** | | | | |
| - 1 | 9,0% | 11,7% | 12,1% | 15,3% |
| - 2 | 7,9% | 10,1% | 9,2% | 13,0% |
| - 3 | 25,4% | 24% | 20,9% | 23,0% |
| - 4 | 57,7% | 54,2% | 57,8% | 48,7% |
| **Study field** | | | | |
| - 1 | 25,9% | 10,6% | 26,2% | 6,8% |
| - 2 | 44,9% | 30,7% | 32,6% | 24,5% |
| - 3 | 19,1% | 0% | 13,3% | 0% |
| - 4 | 10,1% | 58,7% | 27,9% | 68,7% |

*Table 1. Descriptive statistics.*

As the table 1 shows, generally more students start their studies on autumn semesters than in the spring semesters. In the Turku University of Applied Sciences, more degree programmes start on the autumn semesters and also the number of degree programmes has expanded for many years in a row, which explains growth in the number of students starting each semester. Spring semesters have had different focus of study fields, as there has been more students starting on the humanities, medicine, health, and welfare field than there have been in other fields combined. On autumn semesters there has been more degree programmes starting in the field of natural sciences, engineering, agriculture, and forestry. On spring semester there has been zero students of data processing and telecommunications field, as there has not begun any degree programmes in those fields.

Spring semesters have had more females starting their studies than males, whereas males have been dominant in the autumn semesters. Biggest differences in number of males compared to females are on autumn 2017 and spring 2019. On autumn 2017 only 31,2% of students were female and 68,8% were male, whereas is in the spring 2019 the numbers were almost the opposite with females representing 70,8% of the data and males 29,2%. On spring 2018 and autumn 2018 the numbers were more equal, but still there were more females starting their studies on spring and more males starting their studies on autumn. Traditionally there has been more females studying in the humanities, medicine, health, and welfare field and less in the field of natural sciences, engineering, agriculture, and forestry, so this could explain the differences in gender division between different semesters.

Path studies have started in 2013 in the Turku university of applied sciences, but the during the first five years the number of path students have been quite small, only few dozens. Thus, it is not surprising that only 3,5% of students have had background in path studies in autumn 2017. Since then, the number has been growing and has settled around 10 percent each semester. This is in line with the national trend of the growing number of path students in universities of applied sciences. Even though the volumes of path students compared to overall number of students is small, the growing trend can be seen also in this data.

For the age groups the dominant group each semester is the age group 4, which includes students born in 1995 or after. Although younger students form the majority of students each semester, in this data the number of two oldest age groups (students born in 1990 or earlier) has been growing almost each semester. In autumn 2017 the two oldest age groups combined made up 16,9% of all the students when in spring 2019 they made up already 28,3%. This is an

interesting observation considering the aspects of lifelong learning. It should be kept in mind though that the new entrance methods and the effects that they might have had to the student selection cannot be researched through this data, because the data is gathered from the student intake autumn 2017 to spring 2019 and the first bigger reforms were implemented only after these semesters.

The overall numbers of students can be concluded to be growing each semester. Also, number of students with background in path studies grows each semester in the data. Although younger students clearly dominate the overall number of students, the number of older students has been steadily growing in this data. There is no clear trend to be seen with the gender division, but on one hand it seems that when more students start in the field of humanities, medicine, health, and welfare field, also more females start their studies on those semesters. On the other hand, more males start in those semesters when starts the degree programmes in the fields of natural sciences, engineering, agriculture, and forestry. Next it is time to look at the data more deeply and try to answer to the research questions.

### 4.2. Results for autumn 2017 students

The first group to be analyzed is students who began their studies in the autumn 2017. Total number of students who have continued their studies in four study fields is N=780. Around 200 students had dropped out at some point of their studies until the study began. From those 780 students most of the students belong to the age group 4 and most of students are male.

Autumn 2017 had students starting their studies in all the study fields (1 = Business, Administration, Law, and Services, 2 = Natural sciences, engineering, agriculture, and forestry, 3 = Data processing and telecommunications, 4 = Humanities, medicine, health, and welfare). Majority of students belonged to the study field group which is Natural sciences, engineering, agriculture, and forestry with second biggest group being group of Business, Administration and Law and Services. Vast majority of students do not have a background in path studies as only 3,5 % of students in the data had background in path studies.

The amount of credits that students have obtained are not that normally distributed, as there is clear peak around 210 credits. This can be explained by the fact, that many students who started their studies in autumn 2017 have already graduated. For most of the study fields the degree

requirement is either 210 credits or 240 credits with majority of fields having 210 credits as requirement. This explains the spike in the number of credits. Mean of the number of credits is 191,16 so most of students of autumn 2017 in this data have either graduated or are close to graduation in terms of credits when the data was gathered.

GPA is rather normally distributed as well with mean being 3,36 on a scale from 0 to 5. The data shows that some students had not dropped out but still their number of credits and/or GPA is close to zero. Unfortunately, in this research it is impossible to find out in more detail about reasons why some students do not progress in their studies further. Mean of the GPA for autumn 2017 students is 3,36 on a scale from 0 to 5 which can be considered as a good even though the zero GPAs are included as well.

In order to proceed with the data to the actual research questions, first the normality of distributions have to checked. For the first research question the Shapiro-Wilk test indicates that for path studies the group with no path studies background is not normally distributed when looking at amount of credits $W(753) = 0.849$, $p = .000$, but the group with path studies is normally distributed $W(27) = 0.960$, $p = .370$. Similar results can be found when combining GPA and path studies background, as students with no background in path studies are not normally distributed $W(753) = 0.928$, $p = .000$ and students with background in path studies are normally distributed $W(27) = 0{,}971$, $p = .639$.

As normal distribution is a requirement for the use of t-test as an analysis method, suitable analysis method for these groups is Mann-Whitney's U-test. The first research question was then analyzed with Mann Whitney's U-test. Research question is that are there differences between study successes of students with a background in path studies compared with students with a background in joint application. Subquestion for the first question is what the estimated size of effect for the possible differences is.

| | Amount of credits | GPA |
|---|---|---|
| No path studies | Median 190,8 | Median 3,36 |
| Path studies | Median 200,7 | Median 3,18 |
| Significance of difference | .402 | .115 |
| Size of effect (Cohen's d) | .202 | .245 |

*Table 2. First research question results for autumn 2017 students.*

Table 2 presents a summary of the results concerning the first research question. Those students who had background in path studies have more credits (Mdn =200,7) than students who do not have background in path studies (Mdn =190,8). But after running the Mann-Whitney test, it became clear that difference between medians is not statistically significant. U(N no path studies =753, N path studies = 27,) = 9202.500, z = -0,838, p .402.

Subquestion for the first research question was about the size of effect. For path studies and amount of credits size of effect is small because the value is around 0.2 (d = 0.202). Similar results were found also for the GPA. Students who had background in path studies have lower GPA (Mdn = 3,18) than students who do not have background in path studies (Mdn = 3,36). A Mann-Whitney test indicated that this difference is not statistically significant. Size effect is again around 0.2 (d = 0.245), which is another indication that there is no significant difference to be found in terms of GPA either. U (N no path studies =753, N path studies = 27,) = 8353.500, z = -1.575, p .115.

For the first research question it can be concluded that in this data for autumn 2017 students study success does not seem to depend about the fact whether you have background in path studies or not. No significant differences can be found in neither GPA or amount of credits between students with path studies background and student with no path studies background.

| | Amount of credits | GPA |
|---|---|---|
| Study field 1 | Median 210 | Median 3,62 |
| Study field 2 | Median 213 | Median 3,19 |
| Study field 3 | Median 182 | Median 3,3 |
| Study field 4 | Median 210 | Median 3,8 |
| Significance of difference | .000 | .000 |
| Size of effect (Eta-squared) | .058 | .107 |

*Table 3. Second research question results for autumn 2017 students.*

Table 3 presents a summary of the results concerning the second research question. The second research question was that are there differences in different study fields' path students and their study success. Again, in order to find out more about what method would be most suitable for the analysis, it is time to look at the normal distribution of the groups of study fields. Shapiro-Wilk test shows value $p < 0.05$ for normality for most of the study field groups both for amount of credits and GPA. As it can be concluded that study field groups are not normally distributed either, the best option is to proceed with nonparametric counterpart for analysis of variance, the Kruskal-Wallis test.

A Kruskal-Wallis test indicated that for amount of credits difference between study fields is statistically significant that $H(3) = 73.94$, $p = .00$. Also, for the GPA difference between study fields is significant. $H(3) = 93.20$, $p = .00$. The differences between study fields seem to be significant, and after calculating size of effect, the size of effect seems to vary from moderate to large, as for the amount of credits the $r = 0{,}058$ and for the GPA size of effect is $r = 0{,}107$.

For the second research question it can be concluded that there is a statistically significant difference between the study success of different study fields and the size of effect of this difference varies from moderate to large. So, in autumn 2017 there is a difference between the different study field groups and their study success in terms of amount of credits and GPA.

### 4.3. Results for spring 2018 students

The second group to be analyzed is students who began their studies in the spring 2018. Total number of students who have continued their studies in four study fields is N = 179. Around 50 students had dropped out at some point of their studies until the study began. From those 179 students most of the students belong to the age group 4 and most of the students are female. Majority of students belong to the study field group of Humanities, medicine, health, and welfare. Again, vast majority of the students in the data do not have background in path studies, but their percentage has grown to 9,5% from previous semester.

The distribution of amount of credits that students have obtained is similar to autumn 2017 students with mean being 185,59 credits for spring 2018 students. This can also be considered good amount and many students are close to graduation when looking at the number of credits. Spring 2018 students mean is 185,59 which is rather close to autumn 2017 students mean credits 191,16. This can be explained with the fact that many of the autumn 2017 students have graduated but still many students who started their studies on spring 2018 have progressed quite fast with their studies. GPA is rather normally distributed as well with mean being 3,38 so very close to autumn 2017 students mean GPA. The data shows that some students have not dropped out but still their number of credits and/or GPA is close to zero.

The normality for the spring 2018 students seems not to be normally distributed. Shapiro-Wilk test shows value $p < 0.05$ for normality for both amount of credits and GPA variables combined with path studies variable, so this means that the first research question has to be analyzed with Mann-Whitney's U-test. Similar results can be found for study fields, as Shapiro-Wilk test shows value $p < 0.05$ for normality for most of the study field groups both for amount of credits and GPA. As the study field groups are not normally distributed either, the best option is to proceed the second research question is with nonparametric counterpart for analysis of variance, the Kruskal-Wallis test.

| | Amount of credits | GPA |
|---|---|---|
| No path studies | Median 183,85 | Median 3,39 |
| Path studies | Median 191,65 | Median 3,3 |
| Significance of difference | .931 | .132 |
| Size of effect (Cohen's d) | .176 | .134 |

*Table 4. First research question results for spring 2018 students.*

Table 4 presents a summary of the results concerning the first research question. Those students who had background in path studies have more credits (Mdn = 191,65) than students who do not have background in path studies (Mdn = 183,85) A Mann-Whitney test indicated that this difference is not statistically significant, U(N no path studies =162, N path studies = 17,) = 1359,50, z = -0,86, p .931.

Subquestion for the first research question was about the size of effect. For path studies and amount of credits size of effect is small because the d is less than 0.2 (d = 0.176). For the GPA, students who had background in path studies have lower GPA (Mdn = 3,30) than students who do not have background in path studies (Mdn = 3,39). A Mann-Whitney test indicated that this difference is not statistically significant, U(N no path studies =162, N path studies = 17,) = 1071.000, z = -1.506, p .132. Size of effect for path studies and GPA is again small (d = 0.134).

For the first research question it can be concluded that in this data for spring 2018 students study success does not seem to depend about the fact whether you have background in path studies or not. No significant differences can be found in neither GPA or amount of credits between students with path studies background and student with no path studies background.

| | Amount of credits | GPA |
|---|---|---|
| Study field 1 | Median 179 | Median 3,71 |
| Study field 2 | Median 210 | Median 3,19 |
| Study field 4 | Median 197 | Median 3,5 |
| Significance of difference | .006 | .006 |
| Size of effect (Eta-squared) | .033 | .037 |

*Table 5. Second research question results for spring 2018 students.*

Table 5 presents a summary of the results concerning the second research question. A Kruskal-Wallis test indicated that for amount of credits difference between study fields is statistically significant that $H(2) = 10.223$, $p = .006$. Also Kruskal-Wallis test indicated that for GPA difference between study fields is statistically significant that $H(2) = 10.101$, $p = .006$. Even though Kruskal-Wallis test shows significance, the size of effect can be considered to be around small to moderate for both amount of credits and GPA when looking at study fields ($r = 0,033$ for amount of credits and $r = 0,037$). Thus, for the second research question it can be concluded that there is a statistically significant difference between the study success of different study fields of students starting their studies in spring 2018, but the significance can be considered to be rather moderate when looking at the size of effect.

### 4.4. Results for autumn 2018 students

The third group to be analyzed is students who began their studies in the autumn 2018. Total number of students who have continued their studies in four study fields is N=1357. Around 314 students had dropped out at some point of their studies until the study began. From those 1357 students most of the students belong to the age group 4 and most of students are male. Majority of students belonged to the study field group which is Natural sciences, engineering, agriculture, and forestry with second biggest group being group of Humanities, medicine, health, and welfare. Vast majority of students do not have a background in path studies as 8,3 % of students in the data had background in path studies.

The normality for the autumn 2018 students when looking at path studies seems not to be normally distributed at least for the group of no path studies. Group with path studies is more normally distributed. Shapiro-Wilk test shows value $p < 0.05$ for normality for both amount of credits and GPA variables combined with no path studies whereas for the path studies Shapiro-Wilk test show p-values 0.061 and 0.064. Even though group of path studies is more normally distributed for both GPA and amount of credits, because the group with no path studies is not normally distributed, this means that the first research question has to be analyzed with Mann-Whitney's U-test.

The second research question was that are there differences in different study fields' path students and their study success. Again, in order to find out more about what method would be most suitable for the analysis, it is time to look at the normal distribution of the groups of study fields. Shapiro-Wilk test shows value $p < 0.05$ for normality for most of the study field groups both for amount of credits and GPA. As it can be concluded that study field groups are not normally distributed either, the best option is to proceed with nonparametric counterpart for analysis of variance, the Kruskal-Wallis test.

| | Amount of credits | GPA |
|---|---|---|
| No path studies | Median 162,0 | Median 3,48 |
| Path studies | Median 168,3 | Median 3,41 |
| Significance of difference | .800 | .143 |
| Size of effect (Cohen's d) | .134 | .089 |

*Table 6. First research question results for autumn 2018 students.*

Table 6 presents a summary of the results concerning the first research question. Those students who had background in path studies have more credits (Mdn = 168,3) than students who do not have background in path studies (Mdn = 162,0) A Mann-Whitney test indicated that this difference is not statistically significant, U(N no path studies =1244, N path studies = 113,) = 69275,500, z = -0,253, p .800. Subquestion for the first research question was about the size of effect. For path studies and amount of credits size of effect is small (d = 0.134).

For the GPA, students who had background in path studies have lower GPA (Mdn = 3,41) than students who do not have background in path studies (Mdn = 3,48). A Mann-Whitney test indicated that this difference is not statistically significant. U (N no path studies =1244, N path studies = 113,) = 64341.000, z = -1.464, p .143. Subquestion for the first research question was about the size of effect. Path studies and GPA size of effect is small (d = 0.089).

For the first research question it can be concluded that in this data for autumn 2018 students study success does not seem to depend about the fact whether you have background in path studies or not. No significant differences can be found in neither GPA or amount of credits between students with path studies background and student with no path studies background.

| | Amount of credits | GPA |
|---|---|---|
| Study field 1 | Median 165,5 | Median 3,83 |
| Study field 2 | Median 179 | Median 3,19 |
| Study field 3 | Median 151 | Median 3,17 |
| Study field 4 | Median 178 | Median 3,67 |
| Significance of difference | .000 | .000 |
| Size of effect (Eta-squared) | .045 | .130 |

*Table 7. Second research question results for autumn 2018 students.*

Table 7 presents a summary of the results concerning the second research question. The second research question was that are there differences in different study fields' path students and their study success. A Kruskal-Wallis test indicated that for amount of credits difference between study fields is statistically significant that H(3) = 68,590, p = .000. For the amount of credits combined with study fields the size of effect is moderate (r = 0,045). For the GPA the Kruskal-Wallis test indicated that the difference between study fields is statistically significant that H(3) = 191.566, p = .000. For the GPA and study field the size of effect is large (r = 0,130).

For the second research question it can be concluded that there is a statistically significant difference between the study success of different study fields of students starting their studies in autumn 2018. The results show that besides that there is a statistically significant difference

in the study success between different study fields, the significance can be considered either moderate or large, depending on whether we are looking at the amount of credits or the GPA of different study fields.

### 4.5. Results for spring 2019 students

The fourth and last group to be analyzed is students who began their studies in the spring 2019. Total number of students who have continued their studies in four study fields is N=339. Around 73 students had dropped out at some point of their studies until the study began. From those 339 students most of the students belong to the age group 4 and most of students are female. Clear majority of students belonged to the study field group which is Humanities, medicine, health, and welfare. Vast majority of students do not have a background in path studies, even though the number of path students is highest in this group of data with 10,6% of the students having background in path studies.

The normality for the spring 2019 students when looking at path studies seems not to be normally distributed at least for the group of no path studies. Group with path studies is more normally distributed. Shapiro-Wilk test shows value $p < 0.05$ for normality for both amount of credits and GPA variables combined with no path studies whereas for the path studies Shapiro-Wilk test show p-values 0.351 and 0.074. Even though group of path studies is more normally distributed for both GPA and amount of credits, because the group with no path studies is not normally distributed, this means that the first research question has to be analyzed with Mann-Whitney's U-test.

The second research question was that are there differences in different study fields' path students and their study success. Again, in order to find out more about what method would be most suitable for the analysis, it is time to look at the normal distribution of the groups of study fields. Shapiro-Wilk test shows value $p < 0.05$ for normality for most of the study field groups both for amount of credits and GPA. As it can be concluded that study field groups are not normally distributed either, the best option is to proceed with nonparametric counterpart for analysis of variance, the Kruskal-Wallis test.

| | Amount of credits | GPA |
|---|---|---|
| No path studies | Median 142 | Median 3,43 |
| Path studies | Median 150 | Median 3,34 |
| Significance of difference | .839 | .127 |
| Size of effect (Cohen's d) | .181 | .127 |

*Table 8. First research question results for spring 2019 students.*

Table 8 presents a summary of the results concerning the first research question. Those students who had background in path studies have more credits (Mdn = 150) than students who do not have background in path studies (Mdn = 142) A Mann-Whitney test indicated that this difference is not statistically significant, U(N no path studies =303, N path studies = 36,) = 5341.00, z = -0,203, p .839. Subquestion for the first research question was about the size of effect. For path studies and amount of credits size of effect is small (d = 0.181). Students who had background in path studies have lower GPA (Mdn = 3,34) than students who do not have background in path studies (Mdn = 3,43) A Mann-Whitney test indicated that this difference is not statistically significant, U(N no path studies =303, N path studies = 36,) = 4605.50, z = -1.526, p .127. . Subquestion for the first research question was about the size of effect. For path studies and GPA size of effect is small (d = 0.127).

For the first research question it can be concluded that in this data for spring 2019 students study success does not seem to depend about the fact whether you have background in path studies or not. No significant differences can be found in neither GPA or amount of credits between students with path studies background and student with no path studies background.

| | Amount of credits | GPA |
|---|---|---|
| Study field 1 | Median 154 | Median 3,69 |
| Study field 2 | Median 156 | Median 3,16 |
| Study field 4 | Median 151 | Median 3,49 |
| Significance of difference | .975 | .001 |
| Size of effect (Eta-squared) | .019 | .057 |

*Table 9. Second research question results for spring 2019 students.*

Table 9 presents a summary of the results concerning the second research question. The second research question was that are there differences in different study fields' path students and their study success. A Kruskal-Wallis test indicated that for amount of credits difference between study fields is not statistically significant that $H(2) = 0.052$, $p = .975$. The size of effect is small for amount of credits and study fields ($r = 0{,}019$). Kruskal-Wallis test also indicated that for GPA difference between study fields is statistically significant that $H(2) = 13.494$, $p = .001$. The size of effect is moderate for GPA and study fields ($r = 0{,}057$).

For the second research question it can be concluded that there is a statistically significant difference between the study success of different study fields of students starting their studies in spring 2019. The results show that besides that there is a statistically significant difference in the study success between different study fields, the significance of the difference varies from small to moderate, depending on whether we are looking at the amount of credits or the GPA of different study fields.

Data included four semesters of students, starting from autumn 2017 and finishing to spring 2019 students. In the light of findings, four semesters did not differ much in their answers to the research questions. Now that the analysis for the whole data has been presented, it is time to summarize the findings and discuss about them further. The summary of the research results is presented at the next chapter.

## 4.6. Summary of findings

First research question was “Are there differences between study successes of students with a background in path studies compared with students with a background in joint application (students who started at the same time)?” And subquestion for it was “What is the estimated size of effect for differences?”. Table 10 below summarizes the results of different semester into one table so that the results are easier to compare with each other.

| **Semester** | **Autumn 2017** | **Spring 2018** | **Autumn 2018** | **Spring 2019** |
|---|---|---|---|---|
| **Amount of credits** | | | | |
| No path studies | Median 190,8 | Median 183,85 | Median 162 | Median 142 |
| Path studies | Median 200,7 | Median 191,65 | Median 168,3 | Median 150 |
| Difference | Not statistically significant | Not statistically significant | Not statistically significant | Nots statistically significant |
| Size of effect | Small | Small | Small | Small |
| | | | | |
| **GPA** | | | | |
| No path studies | Median 3,36 | Median 3,39 | Median 3,48 | Median 3,43 |
| Path studies | Median 3,18 | Median 3,30 | Median 3,41 | Median 3,34 |
| Difference | Not statistically significant | Not statistically significant | Not statistically significant | Not statistically significant |
| Size of effect | Small | Small | Small | Small |

*Table 10. First research question results summarized.*

Median amount of credits is understandably biggest for autumn 2017 students, as they have progressed furthest in their studies. Many of them had graduated at the time of data gathering which explains the high median. Also, spring 2018 students had progressed far with their studies at the time of data gathering. Autumn 2018 and spring 2019 are newer students so their median amount of credits is less. Overall path students have achieved a bit more credits than students with no path studies background, but the difference in medians is not big. For all the semesters difference in the amount of credits between path students and non-path students is not at

significant level. Size of effect for these differences is also small, which is another indication about the small differences. For each semester path students have a slightly smaller GPA than the students with no path studies background. Difference is in each semester within two decimals. For all the semesters difference in the GPA is not at significant level and as for the amount of credits, also for the GPA all the size of effects were small.

First research question can be answered that when all the semesters included in the study are looked at, no significant differences can be found between the study success of path students and non-path students in terms of amount of credits and GPA. The subquestion can be answered that the size of effect was in each case small.

| **Semester** | **Autumn 2017** | **Spring 2018** | **Autumn 2018** | **Spring 2019** |
|---|---|---|---|---|
| **Amount of credits** | | | | |
| Study field 1 | Median 210 | Median 179 | Median 165,5 | Median 154 |
| Study field 2 | Median 213 | Median 210 | Median 179 | Median 156 |
| Study field 3 | Median 182 | - | Median 151 | - |
| Study field 4 | Median 210 | Median 197 | Median 178 | Median 151 |
| Difference | Statistically significant | Statistically significant | Statistically significant | Not statistically significant |
| Size of effect | Moderate | Moderate | Moderate | Small |
| | | | | |
| **GPA** | | | | |
| Study field 1 | Median 3,62 | Median 3,71 | Median 3,83 | Median 3,69 |
| Study field 2 | Median 3,19 | Median 3,19 | Median 3,19 | Median 3,16 |
| Study field 3 | Median 3,3 | - | Median 3,17 | - |
| Study field 4 | Median 3,8 | Median 3,5 | Median 3,67 | Median 3,49 |
| Difference | Statistically significant | Statistically significant | Statistically significant | Statistically significant |
| Size of effect | Large | Moderate | Large | Moderate |

*Table 11. Second research question results summarized.*

Second research question was “Are there differences in different study fields’ students and their study success?” And subquestion for it was “What is the estimated size of effect for differences?”. Table 11 at the previous page summarizes the results of different semester into one table. It has to be noted that autumn semesters have both four study field groups whereas in spring semesters only three study field groups are present in the data. This is because in spring semesters in this data there were no students starting their studies in the study field 3.

When looking at the table 11, already the medians of the amount of credits differ from each other. For example, in autumn 2017 the lowest group median is 182 credits whereas the highest median is 213 credits. Only in spring 2019 different study fields are close to each other in terms of amount of credits achieved. In the study field 3 less credits were achieved in each semester and in the study field 2 most credits were achieved each semester when looking at the medians. Difference between study fields and their achieved amount of credits is significant in other semesters except in spring 2019. Size of effect is between the amount of credits and different study fields is similar; in all other semesters except spring 2019 the effect is moderate.

Medians of the GPA vary also between study fields. Smallest median of GPA is 3,16 for the study field 2 in spring 2019, whereas the highest median of GPA is 3,83 for the study field 1. Overall study fields 1 and 4 perform better in the median GPA comparison each semester compared with study fields 2 and 3. Difference between the GPA of different study fields are significant for each semester. Size of effect varies from moderate to large when looking at GPA of different study fields.

For the second research question it can be answered that when all the semesters included in the study are looked at, significant differences can be found between the study success of different study fields in terms of amount of credits and GPA. The subquestion can be answered that the size of effect is in each semester is either moderate or large, which is an indication of rather big differences in the study success of different study fields. Next the results of this study are discussed in the light of the earlier research and the theoretical background. First is presented the discussion about the first research question and its results.

# 5. Discussion

## 5.1. Discussion about first research question

Määttä and Uusiautti (2018) present in their study that not only from the students' perspective, but also from the institutions perspective it is important that students' progress in their studies smoothly and graduate in time. Graduating students affect to institutions funding and thus it is important to pay attention to the student and their progress. They conclude that many factors affect study success, such as the community, teachers, and the curriculum but "*perhaps the most important factor in the study process is the student her or himself*" (Määttä & Uusiautti, 2018, p. 30). When asked from the students that what they think about factors affecting to their study success, they described that most important for students was experiences of success. Other important factors of study success from the student's perspective were the atmosphere of the institution and good relationships with fellow students and the teacher. (Määttä & Uusiautti, 2018.)

Student and personal factors can be considered to be the most important element in terms of study success. In this study only few background factors could be measured, but several other factors would be needed to study in order to make a comprehensive analysis of study success. Nevertheless, this study indicates that entrance method might not have an effect to later study success, which is an important finding in terms of access related questions to higher education.

Study success was measured in this research with two quantitative variables, amount of credits and grade point average. When study success is measured in a quantitative way, these are the most common variables to measure study success. Multiple other ways exist to measure study success, but for this research the focus was on quantitative methods and how two background variables, namely path studies background and study field affect to study success. Variables where analyzed in this research with quantitative methods. Heikkilä (2014) describes how for quantitative research the idea is to draw conclusions based on the results of the analysis. Hypotheses are assumptions that are built on previous theoretical knowledge and in quantitative research, the hypotheses are either confirmed or rejected. With the help of hypotheses, research can explain the phenomena occurring in the data. (Heikkilä, 2014.)

At the time of this research, not completely similar studies have been conducted about the study success at university of applied sciences using quantitative methods. Previous studies suggest

that background in open university studies can be beneficial in later degree studies in terms of study success and thus the hypothesis was presented in a way that path studies might have an effect to study success. Here, it should be considered that path studies and their path to degree studies in universities of applied sciences is a bit different from the open university studies. Path students study their first year with the degree students at university of applied sciences and if they succeed in their study well enough, they can apply to become degree students and continue their studies straight away. Open university students also have options to apply to degree studies, but these options vary within different fields and different universities.

The results for the first research question indicate no significant differences could be found between the study success of path students and non-path students when looking at the number of credits and grade point average. As no completely similar studies have been conducted prior to this thesis, this result can not directly be compared with earlier results. When looking at results in comparison with studies concerning study success in universities, the result of this research differs a bit, as for the university students background in open higher education seems to have a small positive effect. The conclusion can be made from the first research question and its results is that the method of entrance to studies (joint application or path studies) does not seem to be relevant in terms of study success in the Turku university of applied sciences.

Entrance method to higher education is in general an interesting and current question as big reforms have been implemented in the previous years for both universities and universities of applied sciences. When looking at the history of universities of applied sciences, one of the main reasons behind founding of them was to add higher education study places for the growing number of students graduating from upper secondary school and seeking access to higher education. Competition over study places in higher education has been always tough and also the previous entrance related reforms were implemented to improve chances of upper secondary school graduates to enter higher education. It remains to be seen whether the reforms are successful. In this data, the reforms and their effects are not measured, as the data is from earlier years, but in the data the trend was that the number of older students were growing. This could be considered positive and just from the perspective of equal educational opportunities for adult learners, but not that favorable for the younger upper secondary school graduates. But still it has to be kept in mind that even in this data the younger students were still clearly the biggest group of students in each semester.

Because it seems that the different entrance routes can be considered rather equal in terms of study success, the question can be asked whether there should be more discussion about what the right method would be to choose students into higher education. Entrance exams and diploma choices have been dominant over the last decades, but this research gives support also for the idea that students with open higher education background seem to be performing in their degree studies similarly well as students chosen through the more traditional routes. As the open higher education has been constantly expanding, a question that can be addressed from the institutional perspective is, whether the students chosen through different methods perform equally well. This research supports the idea that entrance methods are equal when looking at numerically measured study success.

In the report by Ministry of Education and Culture, it was noted that higher education entrance methods have been in constant reform throughout the last decade. On one hand the joint application route has been reformed in a way that it would benefit younger students, but on the other hand other entrance methods have been developed to serve the needs of other applicant groups. According to the Ministry of Education and Culture (2021) report, it is important to develop the route of open higher education into degree studies, because can be seen as a way to increase accessibility, fairness, and equality in the selection process. Open route studies enable studying for students coming from different backgrounds and different situations in life. Open studies enable studying for groups for whom other entrance methods might not be possible. (Kosunen, 2021.)

Even though open higher education has been beneficial for individuals, the route to degree studies has stayed limited in many study fields. In several cases the entrance to degree studies has required a lot of credits and as the places for degree students are limited, only few students actually start their degree studies through the open higher education route. From the institutions perspective the entrance to higher education is a zero-sum game, based on the institution specific degree goals. If the position of one group of applicants is to be improved in student selection, it means a deterioration in the position of others in the current regulation of student selection and the guidance of degree objectives, provided that there is no change in the current conditions. If the entrance through open route or other selection method is to be increased, it is likely that the number of places to be filled by entrance examinations or diploma choices will be reduced. (Kosunen, 2021.)

Ministry of Culture and Education (2021) highlight in their report importance of exploring the full potential of the open higher education and the open route to degree studies. Open higher education can enhance accessibility, equality, and lifelong learning in higher education. Student selection to higher education has been reformed in a large way during the last decade, as the role of earlier success in studies is highlighted by the increasing intake through the diploma selection. Also, entrance exams have been reformed to measure more general skills instead requiring a long preparation to exams. The aims of the student selection reform are to smoothen the path of younger students to higher education, to increase the efficiency of the allocation of study places and increase the accessibility of higher education through these measures. Reforms in the selection of students to higher education are implemented to try to response to the problems that have accumulated over the decades. (Kosunen, 2021.)

Expansion of open higher education would be in line with the aims to increase the participation to higher education and to enhance lifelong learning further. Whereas the entrance related reforms have been made in order to improve the chances of younger students to enter higher education, the expansion of open higher education would support the possibility for other groups to participate into higher education as well. From an institutional perspective open higher education students with background in open higher education perform equally well as students chosen to study through the other routes. The latest entrance related reforms are not visible in the data in this study, because the data is from those years before the reforms have been enacted. Thus, it would be valuable to look into some newer data and compare whether the entrance related reforms affect to study success. Also, possible expansion of open higher education could bring some changes to the comparative setting, if for example open higher education would be expanded to new study fields. In the following chapter the second research question about study fields is discussed further in the light of previous research and the theoretical background. Although the study success is a complex concept, the results of the second research question seen to point out some important factors about study success.

## 5.3. Discussion about second research question

As Kaarina Määttä an Satu Uusiautti point out in their study (2018), besides of the student, also other factors are important when considering study success. These other factors include curriculum, community, and teacher (Määttä & Uusiautti, 2018). The second research question can be considered to be related not only the student, but also the wider perspectives of the curriculum, community, and teacher. Students themselves can flourish in their studies, but the role of other factors cannot be neglected. Differences between the study success of different field can be thought of as a complex phenomenon, like the whole concept of study success.

The second research question was about whether study field has an effect to the study success in the Turku university of applied sciences. Some of previous research concerning universities, such as studies by Korhonen and Rautopuro (2019) and Van den Berg and Hofman (2005) suggested that study field might have an effect to the study success. The results of the analysis undertaken for this thesis research are aligned with the results of Korhonen and Rautopuro (2019) and Van den Berg and Hoffmann (2005), as for the GPA all the semester has significant differences and for the amount of credits all but spring 2019 had no statistically significant differences. Spring 2019 students did not have as much credits as other semesters by the time of study, which could explain the result. Even though the previous literature concerned university students, the results of this research were in line with earlier results concerning university students and their study success.

The first research question did not confirm the hypothesis whereas the second research did confirm the hypothesis about differences in the study success. As explained in the chapter 3.3. about the variables, the study fields were formed as larger study field categories. This was done to ensure the anonymity of the data and to form groups that would be analyzable statistically in terms of the size of the groups. Study fields were grouped with similar fields, but in this research more accurate statistics of certain majors could not be explored. This has to be kept in mind when examining the results.

More specific analysis about majors could reveal some differences within the study fields. However, the result of this research shows that there are statistically significant differences to be found between the broader study fields. Study field 2 (Natural sciences, engineering, agriculture, and forestry) and study field 3 (data processing and telecommunications) have lower medians for GPA for each semester in comparison with study field 1 (Business,

Administration, Law, and Services) and study field 4 (Humanities, medicine, health, and welfare). Study field 3 also has the lowest number of credits in both of those semesters when it had students, both in autumn 2017 and autumn 2018 semesters.

In the study by Korhonen and Rautopuro (2019), study fields of IT, mathematics, and science had bigger risk of not completing their studies. The lowest risk of not completing studies were for the fields of education and economics. In addition, in the study by Van den Berg and Hofman (2005), the fields of healthcare and agricultural fields completed their studies more often than humanistic and law fields. Even though categories in those studies differ from this study, and the measurement of study success differs, but still similar kind of results can be observed in this study. On one hand, natural sciences and IT fields seem to perform not equally well as other fields in terms of GPA. On the other hand, business and health fields seem to perform rather well. To be able to make any further conclusions though, more in depth research about the differences should be made.

A question can be raised that why some study fields seem to be performing worse than some others. Are there some other factors related to students of those fields which could explain the study success further or would there be some other factors that could be influencing the study success of the students. The figure 4 presented earlier included not only the student, but also the curriculum, the teacher, and the university community as crucial factors for study success (Määttä & Uusiautti, 2018). If the factors concerning student would not explain the study success, it could be useful to look at other factors in the model and whether in those areas could be something to improve in those study fields. But as pointed out earlier, based on this research it can be said that study fields differ from each other significantly when looking at the statistics, but to be able to explain why the difference exists, it could be useful to combine different research methods to examine study success of different study fields and as a result the research data could be more versatile.

Määttä and Uusiautti (2018) point out in their studies that study success is a multidimensional concept, which cannot be explained only by one factor such as study field. To be successful student needs a certain kind of attitude to challenge oneself, to work hard towards the goals and to have confidence and optimism towards the possibility of achieving those goals that students have set for themselves. Study success should not also be seen as an end result of something, but instead study success should be seen as a process itself. Measurable outcomes of study success can only explain one part of the multidimensional concept of study success. Even

though for most students' numerical success in studies can be an important achievement and something to pursue, the process itself can be valuable as well. Students have reported the importance of collaboration for study success. (Määttä & Uusiautti, 2018.)

This research is accomplished for the information needs of Turku university of applied sciences. Thus, institutions perspective of study success is relevant, as for the institutions the target is to develop the student selection in a way that it would choose the most motivated students for their studies and thus, students would graduate fast, progress in their studies, and earn a lot of credits throughout their studies. But as Määttä and Uusiautti point out that in this process the crucial factors are not only the students, their motivation, and their skills, but also university can foster students' development, if they are willing to pay attention to students needs and their wellbeing. Also, the teachers' role in providing quality teaching should be considered and thus the teacher needs, and wellbeing are relevant for analyzing aspects of study success in broader terms as well. Student's feedback should be valuable in terms of developing educational institutions practices further. (Määttä & Uusiautti, 2018.)

The second research question and its results highlight not only student related aspects, but also other dimensions related to study success. More in depth research is needed to understand better the reasons behind the differences of study success between and within the study fields. This research shows that difference exists between the study fields, but the reasons behind those differences could not be identified in this study. Differences between the study success of different study fields are an interesting finding, which should be further explored. In the last chapters the findings of this research are concluded, the limitations of this study are discussed, and recommendations for further studies are made.

# 6. Conclusions

## 6.1. Conclusions

The aim of this research was to provide knowledge and thereby enhance understanding on the study success of different groups in the universities of applied sciences. The results of this study can be concluded to have produced new results in the field of study success in the universities of applied sciences. The study success of the students at universities of applied sciences has not been researched much earlier. The results of the study are important for the commissioner of this thesis in the discussion about different entrance methods and the students chosen to study through different selection methods.

Results of this study show that no statistically significant differences can be found between the study success of students with path studies background in comparison with students with joint application background. This result is important when considering the further development of student selection to higher education and also when considering the possible expansion of open higher education.

The results of this research also show that there are statistically significant differences between in the study success of different study fields. Although the reasons behind the differences could not be examined, the results would suggest that study success of different study fields should be further examined.

This study was implemented using quantitative methods of analysis and the study success was analyzed with particular focus on the amount of credits and weighted grade point average. Despite this research, with its specific focus on the study routes and fields of study, provides less a comprehensive account, the thesis research yields new information about the study success of the students at the universities of applied sciences and this information can then be used in further research. Study success is important area of study not only from the institution's perspective, as in this study, but also from the student's perspective, because study success both as a process and an outcome can be regarded as meaningful for all parties.

## 6.2. Limitations

In this study there were several limitations. Firstly, data did not include students who dropped out their studies, because the idea of the study was to look at longer term study success and it was not feasible to include to this study all the students dropping out from different reasons. Student dropouts are used in several research as a way to measure study success. Including dropouts to the study could have changed the results as dropouts tend to have lower number of credits and lower GPA. Including dropouts to the data might have required different methods, if in the research the reasons behind the dropouts would have been included.

Second limitation in this study was the small number of path students. Path studies are rather new way of studying at universities of applied sciences and thus, the number of path students in this data is still relatively low. Because of the small number of paths students, it had to be considered that anonymity of the students would not be endangered and thus, broader study fields were used instead of analyzing the data by solely focusing on different majors. If the data would have been examined based on majors, there could have been detected more detailed differences within the study fields.

Third limitation of this study is that variables included only a small portion of those factors that could affect to study success. As explained in the figure 3, besides of the student, curriculum, teachers, and the whole university community have their effects on study success. The examination of the effect of all of those factors would have required different methods and that would have not been feasible for this study.

Furthermore, study success can be measured in multiple ways and GPA and credits are only one type of way to measure study success. Other ways could include for example measurement of dropout rates, employment of graduates and self-reflection of students. To achieve a comprehensive understanding of study success, varied methods could be used, and it would bring more knowledge about the overall study success to combine different types of methods in one study to understand the study success comprehensively. For the feasibility reasons, this research focused on quantitative aspects of the study success. In the following chapter more recommendations for further research are made.

## 6.3. Recommendations and further research

Two research questions and results for those questions can be considered to have different type of implications. The first research question and answer to that suggests that no statistical differences can be found between the study successes of students with path studies background and students with joint-application background. This implies that different entrance methods to open universities of applied sciences do not seem to have an effect to later success in studies.

Results of this research could be considered to support the idea of expanding different entrance methods. Nevertheless, it has to remembered, that the data included in this study was collected of four semesters, and the latest entrance related reforms and possible effects of those reforms cannot be observed in this data. Thus, it would be recommended to explore further whether the latest reforms in the student selection to higher education have some effect to the students and their study success. Also, the expansion of open higher education and effects of it should be researched further in order to achieve better comprehension of the phenomena of the study success and different factors affecting it.

The second research question and results for that suggest that study field has an effect to study success. In this research it was not possible to separate more closely different fields or look at for example individual majors and the study success in those. For future research it could be beneficial to examine study success within the study fields mentioned in this study in a more detailed way to get more comprehensive understanding of which subjects differ from others in terms of study success.

Because study success is a combination of multiple different factors, it could be useful to combine different research methods to gain a more comprehensive understanding about the study success and the reasons affecting them. Qualitative research methods could provide answers to questions that remained open in this study. Using different methods could be useful, because different actors can have different understanding of what study success consists of and thus, with the combination of different methods possible differences in the understanding of the concept could be elaborated further.

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## Appendix A: Autumn 2017 SPSS tables

Path studies Mann Whitney U-test results and size of effect results

**Ranks**

| | Path studies | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Amount of credits | 1 | 753 | 389,22 | 293083,50 |
| | 2 | 27 | 426,17 | 11506,50 |
| | Total | 780 | | |
| GPA | 1 | 753 | 392,91 | 295858,50 |
| | 2 | 27 | 323,39 | 8731,50 |
| | Total | 780 | | |

**Test Statistics[a]**

| | Amount of credits | GPA |
|---|---|---|
| Mann-Whitney U | 9202,500 | 8353,500 |
| Wilcoxon W | 293083,500 | 8731,500 |
| Z | -,838 | -1,575 |
| Asymp. Sig. (2-tailed) | ,402 | ,115 |

a. Grouping Variable: Path studies

**Independent Samples Effect Sizes**

| | | Standardizer[a] | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|---|
| Amount of credits | Cohen's d | 49,0640 | -,202 | -,586 | ,182 |
| | Hedges' correction | 49,1114 | -,202 | -,586 | ,182 |
| | Glass's delta | 32,1638 | -,309 | -,699 | ,087 |
| GPA | Cohen's d | ,74991 | ,245 | -,139 | ,629 |
| | Hedges' correction | ,75063 | ,245 | -,139 | ,628 |
| | Glass's delta | ,71058 | ,258 | -,134 | ,646 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Study field and Kruskal-Wallis test results and size of effect

**Ranks**

| | Study field | N | Mean Rank |
|---|---|---|---|
| Amount of credits | 1 | 202 | 357,89 |
| | 2 | 350 | 454,12 |
| | 3 | 149 | 272,65 |
| | 4 | 79 | 414,27 |
| | Total | 780 | |
| GPA | 1 | 202 | 463,10 |
| | 2 | 350 | 319,34 |
| | 3 | 149 | 377,66 |
| | 4 | 79 | 544,34 |
| | Total | 780 | |

**Test Statistics[a,b]**

| | Amount of credits | GPA |
|---|---|---|
| Kruskal-Wallis H | 73,939 | 93,201 |
| df | 3 | 3 |
| Asymp. Sig. | ,000 | ,000 |

a. Kruskal Wallis Test

b. Grouping Variable: Study field

**ANOVA Effect Sizes[a]**

| | | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|
| Amount of credits | Eta-squared | ,058 | ,028 | ,090 |
| | Epsilon-squared | ,054 | ,024 | ,086 |
| | Omega-squared Fixed-effect | ,054 | ,024 | ,086 |
| | Omega-squared Random-effect | ,019 | ,008 | ,030 |
| GPA | Eta-squared | ,107 | ,067 | ,146 |
| | Epsilon-squared | ,103 | ,063 | ,143 |
| | Omega-squared Fixed-effect | ,103 | ,063 | ,143 |
| | Omega-squared Random-effect | ,037 | ,022 | ,053 |

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

## Appendix B: Spring 2018 SPSS Tables

Path studies Mann Whitney U-test results and size of effect results

**Ranks**

| | Path studies | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Amount of credits | 1 | 162 | 89,89 | 14562,50 |
| | 2 | 17 | 91,03 | 1547,50 |
| | Total | 179 | | |
| GPA | 1 | 162 | 91,89 | 14886,00 |
| | 2 | 17 | 72,00 | 1224,00 |
| | Total | 179 | | |

**Test Statistics[a]**

| | Amount of credits | GPA |
|---|---|---|
| Mann-Whitney U | 1359,500 | 1071,000 |
| Wilcoxon W | 14562,500 | 1224,000 |
| Z | -,086 | -1,506 |
| Asymp. Sig. (2-tailed) | ,931 | ,132 |

a. Grouping Variable: Path studies

**Independent Samples Effect Sizes**

| | | Standardizer[a] | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|---|
| Amount of credits | Cohen's d | 44,40177 | -,176 | -,675 | ,325 |
| | Hedges' correction | 44,59102 | -,175 | -,672 | ,323 |
| | Glass's delta | 25,43359 | -,306 | -,813 | ,209 |
| GPA | Cohen's d | ,72563 | ,134 | -,366 | ,633 |
| | Hedges' correction | ,72872 | ,133 | -,365 | ,631 |
| | Glass's delta | ,37244 | ,260 | -,251 | ,764 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Study field and Kruskal-Wallis test results and size of effect

**Ranks**

| | Study field | N | Mean Rank |
|---|---|---|---|
| Amount of credits | 1 | 19 | 64,84 |
| | 2 | 55 | 105,90 |
| | 4 | 105 | 86,22 |
| | Total | 179 | |
| GPA | 1 | 19 | 111,97 |
| | 2 | 55 | 73,21 |
| | 4 | 105 | 94,82 |
| | Total | 179 | |

**Test Statistics[a,b]**

| | Amount of credits | GPA |
|---|---|---|
| Kruskal-Wallis H | 10,223 | 10,101 |
| df | 2 | 2 |
| Asymp. Sig. | ,006 | ,006 |

a. Kruskal Wallis Test

b. Grouping Variable: Study field

**ANOVA Effect Sizes[a,b]**

| | | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|
| Amount of credits | Eta-squared | ,033 | ,000 | ,093 |
| | Epsilon-squared | ,022 | -,011 | ,083 |
| | Omega-squared Fixed-effect | ,022 | -,011 | ,082 |
| | Omega-squared Random-effect | ,011 | -,006 | ,043 |
| GPA | Eta-squared | ,037 | ,000 | ,099 |
| | Epsilon-squared | ,026 | -,011 | ,089 |
| | Omega-squared Fixed-effect | ,026 | -,011 | ,088 |
| | Omega-squared Random-effect | ,013 | -,006 | ,046 |

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

## Appendix C: Autumn 2018 SPSS Tables

Path studies Mann Whitney U-test results and size of effect results

**Ranks**

| | Path studies | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Amount of credits | 1 | 1244 | 678,19 | 843665,50 |
| | 2 | 113 | 687,94 | 77737,50 |
| | Total | 1357 | | |
| GPA | 1 | 1242 | 682,70 | 847908,00 |
| | 2 | 113 | 626,39 | 70782,00 |
| | Total | 1355 | | |

**Test Statistics[a]**

| | Amount of credits | GPA |
|---|---|---|
| Mann-Whitney U | 69275,500 | 64341,000 |
| Wilcoxon W | 843665,500 | 70782,000 |
| Z | -,253 | -1,464 |
| Asymp. Sig. (2-tailed) | ,800 | ,143 |

a. Grouping Variable: Path studies

**Independent Samples Effect Sizes**

| | | Standardizer[a] | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|---|
| Amount of credits | Cohen's d | 47,3702 | -,134 | -,326 | ,059 |
| | Hedges' correction | 47,3964 | -,134 | -,326 | ,059 |
| | Glass's delta | 35,9987 | -,176 | -,369 | ,019 |
| GPA | Cohen's d | ,71469 | ,089 | -,104 | ,282 |
| | Hedges' correction | ,71509 | ,089 | -,103 | ,282 |
| | Glass's delta | ,55842 | ,114 | -,079 | ,307 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Study field and Kruskal-Wallis test results and size of effect

**Ranks**

| | Study field | N | Mean Rank |
|---|---|---|---|
| Amount of credits | 1 | 356 | 644,05 |
| | 2 | 443 | 726,58 |
| | 3 | 180 | 479,90 |
| | 4 | 378 | 750,96 |
| | Total | 1357 | |
| GPA | 1 | 354 | 844,75 |
| | 2 | 443 | 514,95 |
| | 3 | 180 | 534,80 |
| | 4 | 378 | 781,12 |
| | Total | 1355 | |

**Test Statistics[a,b]**

| | Amount of credits | GPA |
|---|---|---|
| Kruskal-Wallis H | 68,590 | 191,566 |
| df | 3 | 3 |
| Asymp. Sig. | ,000 | ,000 |

a. Kruskal Wallis Test

b. Grouping Variable: Study field

**ANOVA Effect Sizes[a]**

| | | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|
| Amount of credits | Eta-squared | ,045 | ,025 | ,067 |
| | Epsilon-squared | ,043 | ,023 | ,065 |
| | Omega-squared Fixed-effect | ,043 | ,023 | ,065 |
| | Omega-squared Random-effect | ,015 | ,008 | ,023 |
| GPA | Eta-squared | ,130 | ,098 | ,162 |
| | Epsilon-squared | ,129 | ,096 | ,160 |
| | Omega-squared Fixed-effect | ,128 | ,096 | ,160 |
| | Omega-squared Random-effect | ,047 | ,034 | ,060 |

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

## Appendix D: Spring 2019 SPSS Tables

Path studies Mann Whitney U-test results and size of effect results

**Ranks**

| | Path studies | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Amount of credits | 1 | 303 | 169,63 | 51397,00 |
| | 2 | 36 | 173,14 | 6233,00 |
| | Total | 339 | | |
| GPA | 1 | 303 | 172,80 | 52358,50 |
| | 2 | 36 | 146,43 | 5271,50 |
| | Total | 339 | | |

**Test Statistics[a]**

| | Amount of credits | GPA |
|---|---|---|
| Mann-Whitney U | 5341,000 | 4605,500 |
| Wilcoxon W | 51397,000 | 5271,500 |
| Z | -,203 | -1,526 |
| Asymp. Sig. (2-tailed) | ,839 | ,127 |

a. Grouping Variable: Path studies

**Independent Samples Effect Sizes**

| | | Standardizer[a] | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|---|
| Amount of credits | Cohen's d | 43,468 | -,181 | -,527 | ,165 |
| | Hedges' correction | 43,565 | -,181 | -,526 | ,164 |
| | Glass's delta | 22,685 | -,347 | -,700 | ,010 |
| GPA | Cohen's d | ,70555 | ,127 | -,219 | ,472 |
| | Hedges' correction | ,70713 | ,127 | -,218 | ,471 |
| | Glass's delta | ,50643 | ,177 | -,173 | ,523 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Study field and Kruskal-Wallis test results and size of effect

**Ranks**

| | Study field | N | Mean Rank |
|---|---|---|---|
| Amount of credits | 1 | 23 | 167,07 |
| | 2 | 83 | 168,63 |
| | 4 | 233 | 170,78 |
| | Total | 339 | |
| GPA | 1 | 23 | 184,46 |
| | 2 | 83 | 135,70 |
| | 4 | 233 | 180,79 |
| | Total | 339 | |

**Test Statistics[a,b]**

| | Amount of credits | GPA |
|---|---|---|
| Kruskal-Wallis H | ,052 | 13,494 |
| df | 2 | 2 |
| Asymp. Sig. | ,975 | ,001 |

a. Kruskal Wallis Test

b. Grouping Variable: Study field

**ANOVA Effect Sizes[a,b]**

| | | Point Estimate | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|
| Amount of credits | Eta-squared | ,019 | ,000 | ,053 |
| | Epsilon-squared | ,013 | -,006 | ,048 |
| | Omega-squared Fixed-effect | ,013 | -,006 | ,047 |
| | Omega-squared Random-effect | ,007 | -,003 | ,024 |
| GPA | Eta-squared | ,057 | ,016 | ,107 |
| | Epsilon-squared | ,051 | ,010 | ,102 |
| | Omega-squared Fixed-effect | ,051 | ,010 | ,102 |
| | Omega-squared Random-effect | ,026 | ,005 | ,054 |

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.