Lappeenranta–Lahti University of Technology LUT

LUT School of Engineering Science

Master's degree programme in Business Analytics

Master's thesis

Valtteri Vainio

Factors affecting student satisfaction and timely graduation of higher education students in Finland – Case: student feedback questionnaire

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ABSTRACT

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Keywords: Timely graduation, student satisfaction, higher education, fuzzy logic, logistic regression

The objective of this master's thesis is to identify the factors that influence satisfaction and timely graduation of higher education students. Factors influencing student satisfaction are investigated by utilising methods related to fuzzy logic, while timely graduation is examined by using logistic regression analyses. The data used in the analyses includes the answers to a nationwide student feedback survey from years 2016-2020.

Previous research on the duration of higher education studies has identified study planning, financial support and the students' employment status as significant factors influencing the duration of studies. Results of the logistic regression analyses support the importance of study planning, and also highlight practical training and the internationality of studies as factors influencing timely graduation.

Previous studies on student satisfaction, in turn, have identified the quality of teaching, the content of studies, the infrastructure of higher education institutes, and the support received during thesis process and practical training periods as significant factors influencing student satisfaction. According to several studies, students' gender also has an effect on student satisfaction. The results of the fuzzy logic related causal analysis support the importance of the quality of teaching as well as the support received during practical training periods. However, there was insufficient evidence of the importance of the content of the studies, the infrastructure of the higher education institutions, the support received during the thesis process and the gender of the students. However, the results of the causal analysis suggest that internationality of studies also has a significant impact on student satisfaction.

TIIVISTELMÄ

Valtteri Vainio

Korkeakouluopiskelijoiden opiskelutyytyväisyyteen ja tavoiteajassa valmistumiseen vaikuttavat tekijät Suomessa – Case: opiskelijapalautekysely

Tämän diplomityön tavoitteena on tunnistaa korkeakouluopiskelijoiden opiskelijatyytyväisyyteen sekä tavoiteajassa valmistumiseen vaikuttavia tekijöitä. Opiskelijatyytyväisyyteen vaikuttavia tekijöitä tutkitaan hyödyntämällä sumean logiikan menetelmiä, kun taas tavoiteajassa valmistumista tarkastellaan logististen regressioanalyysien avulla. Analyyseissä hyödynnetty aineisto sisältää valtakunnallisen opiskelijapalautekyselyn vastaukset vuosilta 2016-2020.

Aiemmat korkeakouluopintojen kestoa käsittelevät tutkimukset ovat tunnistaneet opintojen suunnittelun, taloudellisen tuen sekä opiskelijan työtilanteen merkittävinä opintojen kestoon vaikuttavina tekijöinä. Logististen regressioanalyysien tulokset tukevat opintojen suunnittelun tärkeyttä, ja nostavat esille myös harjoittelujaksot ja opintojen kansainvälisyyden, tekijöinä, jotka vaikuttavat tavoiteajassa valmistumiseen.

Aiemmat opiskelijatyytyväisyyttä käsittelevät tutkimukset ovat puolestaan tunnistaneet opetuksen laadun, opintojen sisällön, korkeakoulujen infrastruktuurin, sekä opinnäytetyöprosessin ja harjoittelujaksojen aikana saadun tuen merkittävinä opiskelijatyytyväisyyteen vaikuttavina tekijöinä. Useiden tutkimusten mukaan opiskelijan sukupuolella on myös vaikutus opiskelijatyytyväisyyteen. Sumean logiikan menetelmiin perustuvan kausaalianalyysin tulokset tukevat opetuksen laadun sekä harjoittelujaksojen aikana saadun tuen merkitystä. Opintojen sisällön, korkeakoulujen infrastruktuurin, opinnäytetyönprosessin aikana saadun tuen ja opiskelijan sukupuolen merkittävyydelle ei kuitenkaan löytynyt riittäviä todisteita. Kausaalianalyysin tulokset viittaavat kuitenkin siihen, että myös opintojen kansainvälisyydellä on merkittävä vaikutus opiskelijoiden tyytyväisyyteen.

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1 INTRODUCTION

Even though the proportion of higher education students who have completed their degree in target time has risen in recent years in Finland (Official Statistics of Finland, 2019), it has not stopped the rising development of labor shortage. According to a survey of Finnish chambers of commerce, over 60 % of companies suffer from labor shortage In Finland. In addition to this, over 50 % of the companies estimated that their recruitment needs will grow in the coming years. (Finland Chamber of Commerce, 2020) Although, the increase in students who complete their degrees in target time will not alone solve the problem, it certainly will contribute to solving the problem as long as the quality of education is maintained. Mikko Valtonen argues in a release of Finland Chamber of Commerce (2019) that besides that faster graduation time of higher education students could be a short-term solution for the labor shortage, it would also help public finances as career lengths would increase.

Companies and public finances are not the only ones to benefit from graduation on target time in Finland. The number of graduates who complete their degree in the target time or close to the target time increases the amount of basic funding that the Higher Education Institutions (HEIs) are granted (Act 331/2016; Act 814/2016 § 1; Act 117/2019 § 1; Act 117/2019 § 1). In turn, higher education students who complete their degree within the target time are eligible for student loan compensation (Kela, 2020). Timely graduation might also be an important factor in terms of employment of graduates. Postponing graduation from HEI has been found to impact negatively future employment outcomes in Italy and the USA (Witteveen & Attewell, 2019; Aina & Casalone, 2020).

Like timely graduation, student satisfaction is also an important issue for the HEIs. Students who are satisfied with their studies are more likely to engage in positive word-of-mouth communication than unsatisfied students, and by raising the level of student satisfaction, the HEIs will improve public perception of the quality of the institutions (Hanssen & Solvoll, 2015). A positive public image may attract more applicants which in turn could increase the number of new students who have the capabilities to graduate in target time. However, before the HEIs can improve student satisfaction and the ratio of timely graduation, they must understand what factors have an effect on these phenomena.

Factors affecting student satisfaction and timely graduation of higher education students have been a subject of many studies. However, most of the studies are limited to one HEI or a subsection of HEI. In addition to this, the majority of the studies examining timely graduation of higher education students focus only on demographic and socioeconomic factors. This master's thesis aims to add knowledge on the existing theory by investigating whether timely graduation and student satisfaction of higher education students can be explained by different factors related to students' views, opinions, and experiences about their studies. The research is conducted by analysing the results of a nationwide AVOP (Ammattikorkeakoulujen Valmistumisvaiheen OpiskelijaPalautekysely) student feedback survey (Appendix 1) from the years 2016-2020. The analysed dataset contains answers from more than 100 000 graduates from 22 different Finnish Universities of Applied Sciences (UAS).

1.1   Background of Finnish higher education system

In 1999 Finland signed a Bologna Declaration together with 18 European countries. All the provisions of the declaration were set as measures of a voluntary harmonisation process (EHEA, 1999). As a member of European Higher Education Area (EHEA), which was established as a result of the Bologna Process, Finland has agreed together with other 47 member countries to:

- Introduce a three-cycle higher education system that consists of bachelor's, master's, and doctoral studies.
- Ensure the mutual recognition of qualifications and learning periods that have been completed abroad at other universities.
- Implement a system of quality assurance, to strengthen the quality and relevance of learning and teaching. (European Commission, 2020)

Finnish higher education system consists of universities and UASs. In Finland universities, offer higher scientific and artistic education and award bachelor's, master's, licentiate, and doctoral degrees. The target graduation time for bachelor's degree students at a university is three years and for master's degree students additional two years. In turn, the UASs provide more practical education for students which responds to the needs of labor markets. They award UAS bachelor's degrees and UAS master's degrees. Target graduation time of a UAS bachelor's

degree students is most often between 3.5 to 4.5 years. Before students can begin master's studies at a UAS they must have a UAS Bachelors' degree or another suitable degree and at least two years of work experience after the completion of the previous degree. (The Ministry of Education and Culture in Finland, 2020)

1.2   Objectives and research questions

The purpose of this master's thesis is to provide new information about factors affecting student satisfaction and timely graduation of higher education students. This study aims to fulfill this objective by answering two research questions:

1. *Which education-related factors explain timely graduation of UAS students?*

2. *Which education-related factors explain student satisfaction of UAS graduates?*

The questions will be answered based on the results of logistic regression analyses and fuzzy logic related methods. Logistic regression will be utilised in explaining timely graduation whereas student satisfaction will be examined by investigating simple causal relationships with methods of fuzzy logic. The findings of the study will also be compared with the results of previous studies concerning timely graduation and student satisfaction.

1.3   Limitations and delimitations

This master's thesis examines factors affecting timely graduation and student satisfaction by analysing feedback of students who have graduated from Finnish UASs. Therefore, the findings of this study might not be applicable in countries where education systems differ from the Finnish education system or where students are not eligible to financial aid. The results of the study are also not representative of the whole higher education system as university graduates are not part of the analysis. As the target completion times and education models differ between UAS and university sectors in Finland, the results cannot be generalized to the entire higher education sector. The study also does not consider students who have dropped out because the nationwide AVOP-survey is only for graduates. Hence, some significant factors related to timely graduation and student satisfaction of higher education students may go unnoticed.

The analysis is carried out by examining only the results of the AVOP-questionnaire. Because majority of the questions/statements of the survey do not consider demographic or socioeconomic factors, the analysis part of this study ignores them almost entirely. These factors will however be observed comprehensively in the study's literature review. Similarly, the influence of grades and credits will be considered only in the theoretical part of the thesis. Additionally, the selected research methods do not consider the combined effect of factors. In other words, student satisfaction and timely graduation will be examined with one explanatory variable at a time.

1.4   Structure of the thesis

The structure of the thesis is presented in Figure 1. At the beginning of the first, the object of the study is introduced, and the necessity of the research is rationalized briefly. After that, the research questions are formed, and limitations and delimitations of the study are defined.

Previous studies concerning timely graduation and student satisfaction are presented in the second chapter. At the beginning of the chapter, the selection process of the utilised theoretical materials is explained. This is followed by a literature review of the examined subjects. After this, the research methods of earlier studies are presented. Lastly, theoretical findings are summarized, and research hypotheses are constructed.

The third chapter of the study concerns the analysed dataset and used analysis methods. At the start of the chapter descriptive characteristics of the data are presented and analysed datasets are defined. This is followed by a brief introduction of fuzzy logic and consistency and coverage measures that will be used to examine causal relationships between student satisfaction and different conditions on basis of the AVOP-questionnaire. Lastly, basic principles of logistic regression analysis are presented.

The fourth chapter of the study is divided into two parts. The first part concerns analysis of the factors affecting student satisfaction. In this part, causality relationships are examined with causality and coverage measures. The latter part of the chapter focuses on logistic regression analysis and timely graduation.

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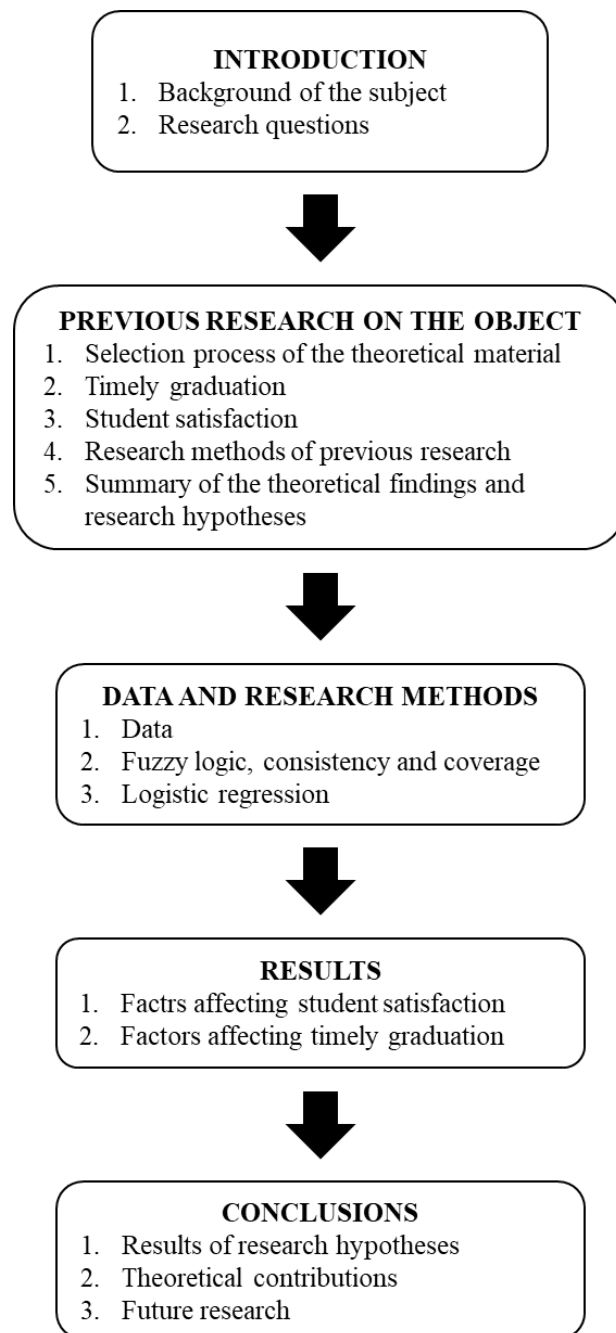
Figure 1. Structure of the thesis

In the last chapter of the study, validity of the research hypotheses is presented. After this, theoretical and empirical findings are summarised and research questions are answered. Lastly, future research subjects are defined based on the results and limitations of the study.

2   PREVIOUS RESEARCH ON THE SUBJECT

In this chapter, a literature review of previous research on the subject is presented and research hypotheses are formed. As this thesis examines the factors influencing timely graduation and student satisfaction in the context of the Finnish HEIs, mostly studies that examine timely graduation and student satisfaction in HEIs located in EHEA were selected. As a quality assurance, only peer-reviewed studies were utilised. The majority of the presented articles are from EBSCO's, Elsevier's, Emerald Journals', IEEE Xplore's, ProQuest's, SAGE's, Springer's, and Wiley's databases.

In the case of timely graduation most of the articles were found by using search terms "timely graduation", "time to degree", "timely completion", "study duration", and "degree duration". The majority of articles concerning student satisfaction were discovered with search terms "student satisfaction" and "study satisfaction". As the utilised search words did not limit the search results enough, articles were rejected based on their titles and abstracts.

2.1   Timely graduation

Naturally, one factor that is used for explaining timely graduation and study duration is the studying habits and traits of higher education students. Haarala-Muhonen et al. (2017) investigated whether different study profiles of first-year law students at a Finnish university have any effect on their timely graduation. They found out that *organized students* who have a rational ability to plan, prioritize and put an effort into their studies, as well as students who aim to create a concrete understanding of the studied subject by applying a *deep approach* on their studies, are more likely to graduate in a timely manner than their counterparts, *unorganised students* and *students applying surface approach* (see Haarala-Muhonen et al. (2017) for deep approach and surface approach). These findings support the claim of Hall et al. (2008) who argued that students who have a higher internal locus of control are more likely to graduate in a timely fashion. Similarly, the findings of Schmidt et al. (2010), who investigated timely graduation in Dutch medical schools, indicate that higher levels of self-study lead to faster graduation. Surprisingly, they found that as opposed to time used for self-study the number of lectures had a negative influence on study duration. They argue that the reason for this is the fact that if there are too many lectures students do not have enough time for self-study which

hampers the learning process. However, the importance of attending lectures cannot be ignored. According to Aina et al. (2011) students who attend more than 75 % of the lectures are more likely to graduate than students who attend between 50 % and 75 % of the lectures in Italian universities.

The effect of student aid and financial incentives on timely graduation is also a highly researched subject. Glocker (2011) examined the effect of financial aid for students from low-income families on study duration in German tertiary institutions. Her findings indicate that student aid decreases the hazard of drop-out but does not have a significant effect on study duration. She argues that the impact of student aid on bachelors' and master's degree completion has increased as less time is allowed for completing studies under the Bologna system which restricts the working possibilities of students. Facchini et al. (2020) investigated whether student grants influence the rates of timely graduation and student dropout in Italy. They determined that financial aid decreased the risk of students leaving the university and increased the probability of timely graduation. They however noted that the financial aid must be sufficient, and students have to be prepared and possess needed skills for the studies so that the grant would have the desired effect. Gunnes et al. (2013) examined how a reform, that entitled restitution from the Norwegian state educational loan fund for students who graduated on the stipulated time, affected study duration. Their findings indicate that the reform had a positive effect on study duration as the average delay of graduation decreased and the share of on-time graduants increased during the reform period. Yet, more favourable financial incentives do not always guarantee that more students will graduate in target time. Arendt (2013) found out that although student loans and grants were increased in Denmark it did not affect timely graduation of university students. The Danish reform however decreased drop-out rates in universities.

To cover living expenses or to gain work experience some higher education students work during their studies. For this reason, the effect of working on timely graduation is a subject of many studies. Lassibille & Navarro Gómez (2011) investigated the main determinants of time to degree in a Spanish university and argued that job responsibilities have a significant slowing effect on the degree process of students. Similarly, research of Behr & Theune (2016) on timely graduation in German universities suggests that off-campus work has a strong relationship with

study duration. They investigated the impact of off-campus work on time to degree in ten different fields of education and found out that there was a significant effect in the majority of the fields. The findings are consistent with another study by Theune (2015), who claims that higher intensities of work lead to higher durations of study. Glocker (2011) however argues that working during studies is not detrimental for the duration of the studies as long as the time for work does not decrease the time used for studying. This claim is supported by the findings of Katsikas & Panagiotidis (2011) who examined the relationship between students' socioeconomic background and educational outcomes in a Greek university. They argue that the length of a working period does not affect study duration whereas the form of employment has a clear impact on the duration of studies as students involved in full-time employment are more likely to graduate after students who are working in part-time jobs.

The findings of Behr & Theune (2016) indicate that the parental background of students may have an indirect impact on timely graduation as students without any parental academic background and students whose parents provide below-average financial support are more likely to work during their studies. Despite this, Theune (2015) did not find a relationship between time to degree and parental education background in German universities. However, parental education background has been found to have a significant effect on timely graduation in Spain and Italy (Lassibille & Navarro Gómez, 2011; Aina et al., 2011; Contini et al., 2018). Differing financial aid programs and cultures may explain the inconsistent findings between countries.

2.2   Student satisfaction

According to van Rooij et al. (2018) students who are satisfied cope better with academic demands and are less likely to drop out. Mikulić et al. (2015) argue that identification of the main sources of student satisfaction and dissatisfaction is an important objective for HEIs as it enables the institutes to design effective and efficient quality improvement programs. For these and many other reasons factors influencing student satisfaction have been investigated a lot.

Multiple studies show a strong relationship between student satisfaction and teachers' teaching methods and practices. Mikulić et al. (2015) investigated drivers of student satisfaction and dissatisfaction in a Croatian university. They argue that HEIs should motivate teachers to be

more engaged and effective as teachers' attitude toward students and ability to present course materials in an understandable manner were found to have the most influence on student satisfaction. In addition, teachers' ability to create interest and encourage students to participate and work actively were discovered to have a much stronger potential to cause dissatisfaction than satisfaction. Martirosyan (2015) examined factors contributing to student satisfaction in Armenian HEIs and she identified three faculty-related factors that have a negative influence on student satisfaction. According to her, students are not satisfied if their individual learning differences are not considered, teachers do not have sufficient knowledge about their field, or they have a graduate teaching assistant as an instructor. Similarly, a British case study that investigated how the determinants of university student satisfaction changed during a 10-year period (2007-2016) indicated that quality of teaching has significant explanatory power on student satisfaction (Burgess et al., 2018). This finding is supported by Poon (2019) who also investigated factors influencing student satisfaction in British universities. She argues that teaching performance and enthusiasm of teaching staff has a positive effect on student satisfaction. Catalan research conducted by Berbegal-Mirabent et al. (2018) stresses similarly the importance of teaching experience regarding student satisfaction. They argue that lecturers' teaching experience has a positive impact on student satisfaction. However, experience leads at the same time to increased research intensity which has a negative influence on satisfaction.

Cooperation between students and staff has also been found to influence student satisfaction. Maxwell-Stuart et al. (2018) examined the effect of support and co-creation on student satisfaction in British HEIs. Their findings indicate that students are more satisfied in their studies if they are accessing support mechanisms and actively engaging with staff in co-creation activities such as participation in decision making and problem-solving. De Kleijn et al. (2012) examined the relationship between the perceived master's thesis student-supervisor relationship and student satisfaction in a Dutch university. Their study indicates that students who perceive more affiliation from their supervisor are more satisfied. However, a highly controlling supervisor was found to have a negative impact on satisfaction which suggests that master's thesis supervisors should find the correct balance of control for students to be satisfied.

In addition to teachers' teaching methods and practices, the influence of content and characteristics of courses on student satisfaction has been also the subject of studies. Mikulić et al. (2015) found interesting lectures, organisation of courses, and clearly defined evaluation criteria to have a big impact on student satisfaction. They also classified the usefulness and amount of course literature as *frustrators* because of their strong negative asymmetries with student satisfaction. The findings of Poon (2019) indicate that there is a clear relationship between student satisfaction and content and organisation of courses. She claims that a clear structure of courses and courses which enable students to have personal development has a positive impact on student satisfaction. Similarly, Gruber et al. (2010) who examined student satisfaction in a German university argue that the relevance of teaching to practice has a significant effect on student satisfaction.

Studies have also found that the image of HEI and students' perceptions of HEI's services have a direct effect on student satisfaction. The findings of Gruber et al. (2010) indicate that institutions' reputation has a medium-strong relationship with student satisfaction in Germany. Alves & Raposo (2010) investigated the influence of university image on student satisfaction in Portugal. They argue that measuring and understanding university image is very important for HEIs as it has a direct and significant impact on both, student satisfaction and student loyalty. These findings are consistent with other studies examining the same subject in different countries (Brown & William, 2009; Chandra et al., 2019; Hwang & Choi, 2019). Studies from Southern Europe also suggest that students' perception of HEI's social responsibility has a direct influence on student satisfaction. (Vázquez et al., 2015; Vázquez et al., 2016; Santos et al., 2020) One important service dimension that has been found to affect student satisfaction is the infrastructure of HEI.

According to Kärnä et al. (2013) who examined user satisfaction on a campus of a Finnish university, students appreciate the safety of the campus area, the general appearance, and comfortability of the general-purpose facilities, and information about coming changes and renovations. They also found out that indoor air quality has a significant influence on student satisfaction as it affects the appeal and use of university facilities. Kärnä & Julin (2015) suggest that physical facilities may have a bigger impact on student satisfaction than general infrastructure-related factors such as accessibility. This finding is consistent with Norwegian

research conducted by Hanssen & Solvoll (2015) who as well stressed the importance of HEI's facilities on student satisfaction. Their research indicates that especially the quality of social areas such as auditoriums and libraries has a strong relationship with student satisfaction. This claim is further supported by the findings of Gruber et al. (2010).

Unsurprisingly many studies have also found a strong relationship between student satisfaction and factors that are not directly related to HEIs. Lenton (2015) suggests that students who are ready and confident to face the labor market are more satisfied with their studies. She also argues that higher education students' future employability prospects have a significant effect on student satisfaction in the UK. The findings of Hanssen & Solvoll (2015) do not support this claim as they found out that the job prospects of students do not have a significant effect on student satisfaction. They however speculate that this might be a result of Norway's high employment rate. Garcia-Aracil (2009) who investigated factors influencing student satisfaction in European HEIs argues that parents' educational background has an effect on student satisfaction as the higher the parent's educational level is the more satisfied students are with their studies. Her findings also indicate that the study motives of students have an influence on student satisfaction. She found out that students who seek preferentially to make money are less satisfied than students who are driven by non-pecuniary motives.

As for demographic factors, most studies indicate that gender is the only significant demographic factor in terms of student satisfaction. Garcia-Aracil (2009), Martirosyan (2015), and Poon (2019) all found males to be more satisfied in their studies than females. However, this result is not supported by the findings of Fernández-García et al. (2021) who examined how socio-demographic factors of nursing students and clinical educators affect students' satisfaction with their clinical educator, learning environment, activities performed, the university's organization of the clinical practice and overall satisfaction in a Spanish university. They found females to be more satisfied with their studies than males but stressed the fact that nursing is still a feminized profession and therefore significant conclusions should not be made based on the finding. In addition, they found that the number of students supervised by the clinical educator had a negative influence on students' satisfaction with clinical practice. This finding stresses the importance of support and guidance received during practice on student

satisfaction which is also supported by other earlier studies (Admi et al., 2018; Antohe et al., 2016).

2.3   Research methods of previous studies on the subject

As the previous chapters showed, factors influencing timely graduation and student satisfaction in HEIs have been studied from many different perspectives. Similarly, the methods that were utilised in the presented studies varied a lot because the content and size of examined datasets differed much between the studies. As in this thesis, Haarala-Muhonen et al. (2017) also examined factors influencing study duration by investigating the results of a survey. First, they utilized Latent Profile Analysis (LPA) for dividing respondents into four homogenous groups based on their questionnaire answers. After this, they used chi-square analyses to explore the relationship between the formed groups and the graduation time of students. In turn, Schmidt et al. (2010) investigated how study-related factors affected study duration by using correlation analysis and Structural Equation Modeling (SEM) whereas Katsikas & Panagiotidis (2011) utilised a probit model for investigating how working status affects study duration.

Naturally, different duration models are also popular when examining factors affecting time to degree. Aina et al. (2011) utilised a survival analysis technique with a discrete hazard setting based on a complementary logistic model to find out which factors have an influence on study duration. Lassibille & Navarro Gómez (2011) in turn investigated determinants of time-to-degree by using accelerated failure-time models which assume a linear relationship between the log of latent survival time and characteristics. Theune (2015) investigated the relationship between students' working status and time to degree with a proportional hazards model whereas Arendt (2013) examined how student grants reform affected drop-out and completion rates by using discrete duration models. Glocker (2011) approached the problem in a similar manner. She investigated the influence of student aid on study duration with a discrete duration model that took into account the risks of drop-out and graduation. Gunnes et al. (2013) in turn utilised a Difference-In-Differences (DID) framework in order to compare two control groups and to find how financial incentives affect study duration.

However, duration models are not the only option for examining the effects of student aid on timely graduation. Contini et al. (2018) examined how sociodemographic characteristics, prior

schooling, university features, and specific contextual factors are related to university enrolment, drop-out, and timely degree attainment. For figuring this out they first utilised logistic regression for investigating all three events individually. In later stages, they compared probabilities of different events against each other's to understand better the differences between dissimilar student clusters. Facchini et al. (2020) in turn utilised Coarsened Exact Matching (CEM) and Entropy Balancing Method (EBM) for comparing students who had received a grant with students who had not received a grant in order to identify weights of different observations. Finally, the effect of student aid on timely graduation and drop-out was examined by applying a binomial logistic regression on an analytical sample in which observations were weighted with the identified weights.

Mikulić et al. (2015) investigated drivers of student satisfaction by utilising Impact-Asymmetry Analysis (IAA) in combination with Impact-Range Performance Analysis (IRPA). They selected the method because in addition to helping to find factors that have the strongest influence on student satisfaction it also facilitated the identification of attributes that have a larger potential to cause satisfaction and attributes with a larger potential to cause dissatisfaction than satisfaction.

Burgess et al. (2018) analysed determinants of student satisfaction by investigating results of a British student survey. They utilised Minimum Norm Quadratic Unbiased Estimation (MINQUE) and Analysis of Variance (ANOVA) for determining what role the university attended, subject studied, and individual survey items had on mean satisfaction scores. After this, they used Principal Axis Factoring (PAF) for constructing explanatory variables that were entered into a linear regression model for finding which factors had the biggest influence on student satisfaction. Similarly, to Burgess et al. (2018), Martirosyan (2015) also utilised ANOVA for examining the influence of demographic factors on student satisfaction. In addition to this, she also used multiple regression analysis to determine which student satisfaction measurement dimensions were significant predictors of overall student satisfaction.

Lenton (2015) investigated the effect of multiple factors on overall student satisfaction in universities based on the results of a British student questionnaire by using random effects and fixed effects estimations. In turn, Poon (2019) who also investigated results of a British student

survey, utilised correlation analysis for identifying which factors influenced student satisfaction. Maxwell-Stuart et al. (2018) who as well analysed the results of a student questionnaire used a Partial Least Squares based (PLS) multi-group analysis in order to evaluate whether differences among mode of study and fee status groups are significant regarding student satisfaction. Vázquez et al (2015; 2016) also selected PLS as the method for investigating student satisfaction. However, first, they utilised factor analysis and Principal Component Analysis (PCA) in order to construct consistent factors from 46 items. This led to construction of six factors which effect on university social responsibility was tested with a PLS technique. The same technique was used also for investigating how the quality of service impacts student satisfaction.

Unsurprisingly, different regression models have been popular when examining drivers of student satisfaction. Kärnä et al. (2013) examined the influence of campus-related factors on student satisfaction by utilising stepwise regression analysis. They decided to use the method because it is useful when dealing with multiple variables which was the case in the study. At the start, the analysis consisted of 22 explanatory variables but in the end, the model contained only 7 variables that were considered as significant. Hanssen & Solvoll (2015) who also examined the influence of university facilities on student satisfaction ended up as well using a regression model in their analysis. Garcia-Aracil (2009) analysed the effect of different factors on graduates' study satisfaction in two complementary ways. First, she built a pooled sample that included data for higher education graduates from 11 European countries weighted by the share of population and students of the equivalent countries. This was followed by regression analysis as she constructed three different probit models with unique sets of explanatory variables for understanding factors affecting student satisfaction transnational level. Finally, individual country regressions were carried out for exploring possible divergent national patterns on the studied subject. Gruber et al. (2010) used factor analysis in order to utilise the results of a student feedback survey for explaining which factors influence student satisfaction. The internal consistency of constructed factors was verified by examining Cronbach's alpha values of each variable. After this correlation analysis was conducted to describe the relationship between quality dimensions and general student satisfaction. Lastly, they conducted a multiple regression analysis in order to explore how the quality dimensions predict general satisfaction independently from each other.

In addition to regression models, structural equation models have also been a popular tool for investigating student satisfaction. To identify how the relationship between student and thesis supervisor affects, final grade, perceived supervisor contribution to learning, and satisfaction de Kleijn et al. (2012) fitted multiple structural equation models that were all used for explaining the studied subject. First, they fitted a linear-only model as a baseline. After this quadratic model was fitted for investigating whether quadratic effects would improve the fit of the model. Finally, they fitted a third model that included only those quadratic effects that were deemed as relevant. Berbegal-Mirabent et al. (2018) utilised multiple methods for examining factors that affect student satisfaction. First, they used Confirmatory Factor Analysis (CFA) for constructing factors from two dimensions and ensured the internal consistency of the factors by calculating Cronbach's alphas for them. After this utilised Mann-Whitney U test and Kruskal-Wallis test with the constructed factors for identifying if variables had the same distribution among their categories. After this, they conducted SEM for analysing the mediating effect of research intensity on student satisfaction. Finally, a multigroup analysis was conducted in order to test invariance between labour contract categories.

Fernández-García et al. (2021) examined how socio-demographic factors related to students and clinical educators affect student satisfaction with hierarchical regression models (HRM) and Fuzzy-set Qualitative Comparative Analysis (FsQCA). In regarding HRM, they first entered student-related variables into a linear regression model. In the second step, they entered variables related to clinical educators into the model. The first step of the FsQCA was the calibration of values for suitable form. After this, they conducted necessary and sufficiency analysis for finding necessary and sufficient conditions. Finally, a truth table was constructed for summarizing the combinations of the causal condition values for the values associated with the result conditions.

In summary, different duration models have been extremely popular methods for investigating study duration. However, logistic regression models have been found to be useful when the studied outcome (timely graduation) is presented in binary form. In the case of student satisfaction, regression models and structural equation methods have been favoured by researchers. In addition, ANOVA and fuzzy logic-based methods have been utilised for

explaining relationships between student satisfaction and different factors. Furthermore, as a majority of the student satisfaction related studies are based on results of surveys, factor analysis has been a popular method for obtaining usable explanatory variables.

2.4   Summary of the theoretical findings

Most studies concerning timely graduation examine student aid and demographic and socioeconomic factors of students. Some studies have found financial incentives to have a positive influence on timely graduation (Gunnes et al., 2013; Facchini et al., 2020) whereas other studies have not found clear evidence for supporting the relationship (Glocker, 2011; Arendt, 2013). Although the findings of the studies are not consistent in terms of timely graduation, all the presented articles found that financial incentives decreased drop-out rates in HEIs. Unlike studies concerning financial incentives, researches examining the impact of working during studies on timely graduation shared similar conclusions (Glocker, 2011; Katsikas & Panagiotidis, 2011; Lassibille & Navarro Gómez, 2011; Theune, 2015; Behr & Theune, 2016). Findings of the studies indicate that working during studies does not have a negative effect on study duration as long as the time for work does not decrease the time used for studying. Findings of students' parental background influence on timely graduation are inconsistent. In Germany, clear evidence for the relationship between the two factors have not been found (Theune, 2015), but studies from Spain and Italy have found that parents educational background influences study duration (Lassibille & Navarro Gómez, 2011; Aina et al., 2011; Contini et al., 2018).

However, these findings regarding timely graduation are not relevant for this study as this thesis examines how study-related factors affect timely degree attainment. Fortunately, a few studies have investigated also timely graduation in the context of study-related factors. Haarala-Muhonen et al. (2017) found that students' learning and studying habits have a significant impact on study duration. The findings of Schmidt et al. (2010) indicate that time used for self-study has a positive impact on timely graduation whereas study duration increases if also the number of lectures is increased. Aina et al. (2011), however, stress the importance of attending lectures as students who attend more than 75 % of the lectures are more likely to graduate than students who do attend lectures as often. These findings indicate that there has to be a correct

balance between time used for self-study and time spent in lectures due to which the first research hypothesis is:

H1 *Good planning of studies has an influence on timely graduation*

As opposed to the majority of studies concerning timely graduation, many researches regarding student satisfaction examined the phenomenon with study-related factors. Multiple studies have found especially teachers' teaching methods and practises to be a major factor contributing to student satisfaction (Martirosyan, 2015; Mikulić et al., 2015; Burgess et al., 2018; Poon, 2019). According to the studies, students appreciate teachers who are able to create interest on the studied subject and consider the individual needs of students. Berbegal-Mirabent et al. (2018) argue that whereas teachers' teaching experience has a positive impact on student satisfaction it at the same time impacts student satisfaction negatively as experience leads to increased research intensity. In turn, Maxwell-Stuart et al. (2018) found that co-creation activities between students and staff influence student satisfaction positively. A study conducted by de Kleijn et al. (2012) indicates that students who perceive more affiliation from their supervisor during the thesis process are more satisfied. Based on these findings following research hypotheses are formed:

H2 *Perceived teaching quality affects student satisfaction*
H3 *The support received during the thesis process has an influence student satisfaction*

Findings regarding content and characteristics of courses on student satisfaction indicate that students are more satisfied if the courses are well organised, evaluation criteria of courses are defined clearly, study content enables students to have personal development, and teaching is relevant to practice (Gruber et al., 2010; Mikulić et al., 2015; Poon, 2019). Thus, the fourth research hypothesis is:

H4 *Perception of study content has an impact on student satisfaction*

In addition to staff and courses, other factors related to HEIs have also been esteemed to influence student satisfaction. Studies have found students' perception of their HEI's image

(Brown & William, 2009; Gruber et al., 2010; Raposo, 2010; Chandra et al., 2019; Hwang & Choi, 2019) and social responsibility (Vázquez et al., 2015; Vázquez et al., 2016; Santos et al., 2020) to have a direct effect on student satisfaction. Studies have also defined the infrastructure of HEIs as an important factor regarding student satisfaction. Especially quality of social areas has been found to have significant impact on student satisfaction. (Gruber et al., 2010; Kärnä et al., 2013; Hanssen & Solvoll, 2015; Kärnä & Julin, 2015) Therefore, the fifth research hypothesis is:

H5 *The infrastructure of HEIs has an influence on student satisfaction*

With regard to demographic factors, studies have found gender to have a significant effect on student satisfaction. Garcia-Aracil (2009), Martirosyan (2015), and Poon (2019) all found males to be more satisfied in their studies than females. Based on these findings the sixth research hypothesis is:

H6 *Males are more satisfied with their studies than females*

Lastly, findings of Fernández-García et al. (2021) indicate that the support and guidance received from the clinical educator have a significant effect on students' satisfaction with clinical training as the increasing number of supervised students by clinical educator had a negative influence on student satisfaction. Hence, the seventh and last research hypothesis is:

H7 *Students who have received an adequate amount of support and guidance during their practical training are more satisfied with their training periods*

3 DATA AND RESEARCH METHODS

The data used in this study comes from a Finnish nationwide AVOP student feedback survey (Appendix 1). The whole dataset contains answers from 112 241 students who completed a UAS bachelor's degree in the years 2016-2020 in 23 Finnish UASs. In addition to three background questions at the start of the survey the respondents answered in total 101 questions/statements concerning 13 different themes:

1. Study content (10 questions)
2. Planning studies, counselling (12 questions)
3. Teaching (8 questions)
4. Studying (8 questions)
5. Learning environments (8 questions)
6. Support services (6 questions)
7. Feedback and assessment (9 questions)
8. Internationality, multiculturalism, and language studies (6 questions)
9. Connection with the working life (6 questions)
10. Career services (5 questions)
11. Practical training (6 questions)
12. Thesis (8 questions)
13. General satisfaction (9 questions)

Based on the first 12 themes of the questionnaire the same number of explanatory variables were created. Values of explanatory variables were generated by calculating the average from respondents' answers on agree/disagree statements. As a measure of internal consistency, a reliability coefficient Cronbach's alpha was estimated for each variable:

$$\alpha = \frac{k * \bar{r}}{1 + (k - 1) * \bar{r}}$$

$k = $ Number of statements

$\bar{r} = $ Mean correlation

The reliability coefficient value of all of the variables was clearly over 0.7 (Table 1) which indicates high internal consistency. In other words, variables are fit to be used in the analysis.

Table 1. Reliability coefficients of variables

Variable	Cronbach's alpha
Study content	0.90
Planning studies, counselling	0.90
Teaching	0.93
Studying	0.88
Learning environments	0.84
Support services	0.83
Feedback and assessment	0.91
Internationality, multiculturalism, and language studies	0.81
Connection with the working life	0.88
Career services	0.85
Practical training	0.88
Thesis	0.86

Factors affecting student satisfaction will be investigated by analysing the whole dataset with fuzzy logic related methods. Because study duration information from every respondent is not available, factors influencing timely graduation will be examined with a subset of the whole dataset that contains answers from 94 101 graduants. The demographic background of respondents is presented in Table 2 and Table 3 shows the graduants by field of education. In the years 2016-2020 in total 119 397 UAS bachelor's degrees were attained in Finland. (Vipunen – Educations Statistics Finland, 2021) On this basis can be stated that the utilised material represents well the whole student population as the response rate was approximately 94 %.

Figure 2 indicates that females seem to be slightly more satisfied with their education as a whole compared to males which is not consistent with previous researches on the subject that have found males to be generally more satisfied with their studies. However, *H6* will not be rejected based on this observation, and differences between genders in terms of study satisfaction will be investigated further in this thesis.

In the case of timely graduation, there appears to be a significant difference regarding to genders. Over 70 % of the female respondents graduated in target time whereas only 55 % of male respondents completed their studies in target time (Figure 3).

Table 2. Demographic background of respondents

	Whole dataset		Timely graduation subset	
Age (years)	**Number**	**%**	**Number**	**%**
Under 25	40 452	36.0	32 960	35.0
25-34	51 078	45.5	43 543	46.3
35-45	14 483	12.9	12 406	13.2
Over 45	6 228	5.5	5 192	5.5
Gender				
Female	67 621	60.2	57 189	60.8
Male	44 053	39.2	36 487	38.8
Other / prefer not to answer	567	0.5	425	0.6
Prior education				
Matriculation / baccalaureate / A levels	49 886	44.4	41 594	44.2
Vocational qualification or equivalent	27 586	24.6	23 500	25.0
Matriculation / baccalaureate and vocational qualification	13 527	12.1	11 626	12.4
College-level or post-secondary non-university diploma	5 956	5.3	4 858	5.2
Higher education degree	11 913	10.6	9 810	10.4
Foreign diploma / degree	2 276	2.0	1 781	1.9
No degree / diploma after basic education	756	0.7	603	0.6
Other	361	0.3	329	0.3

Table 3. Respondents by field of education

Field of education	Whole dataset		Timely graduation subset	
	Number	**%**	**Number**	**%**
Agriculture, forestry, fisheries, and veterinary	2 258	2.0	1 832	1.9
Arts and humanities	6 146	5.5	5 002	5.3
Business, administration and law	23 321	20.8	20 446	21.7
Education	1 160	1.0	995	1.0
Engineering, manufacturing, and construction:	21 642	19.3	17 786	18.9
Health and welfare	40 498	36.1	34 251	36.4
Information and Communication Technologies (ICT):	8 016	7.1	7 048	7.5
Natural sciences, mathematics, and statistics	192	0.2	129	0.1
Services	8 641	7.7	6 311	6.7
Social sciences, journalism and information	336	0.3	301	0.3
Information missing	31	0.0	0	0
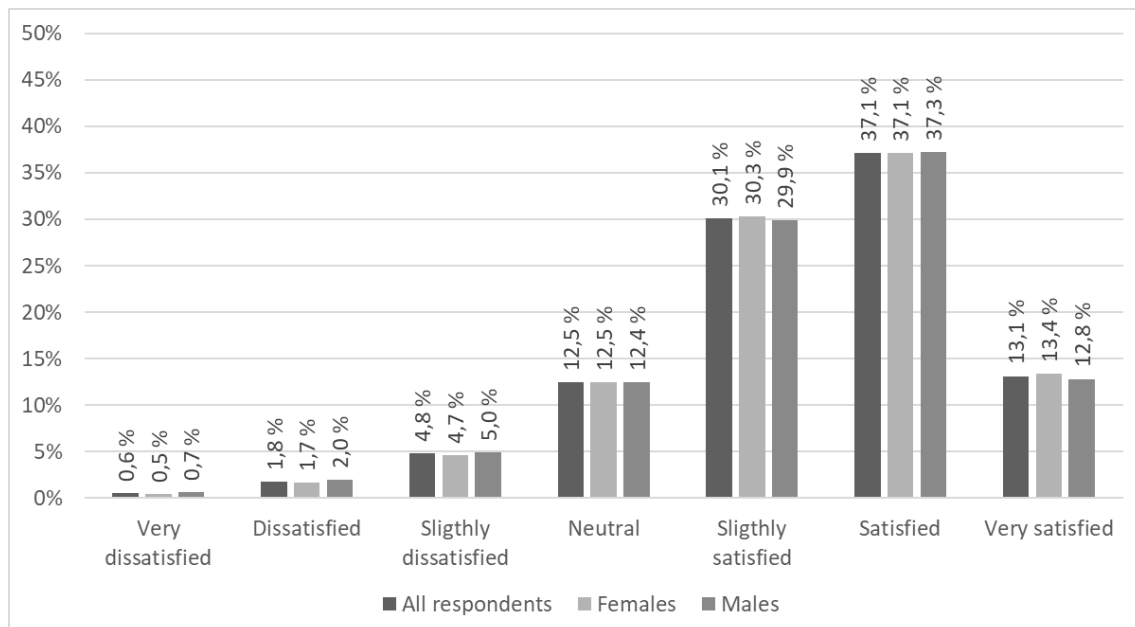
Figure 2. Respondents' satisfaction with education as a whole
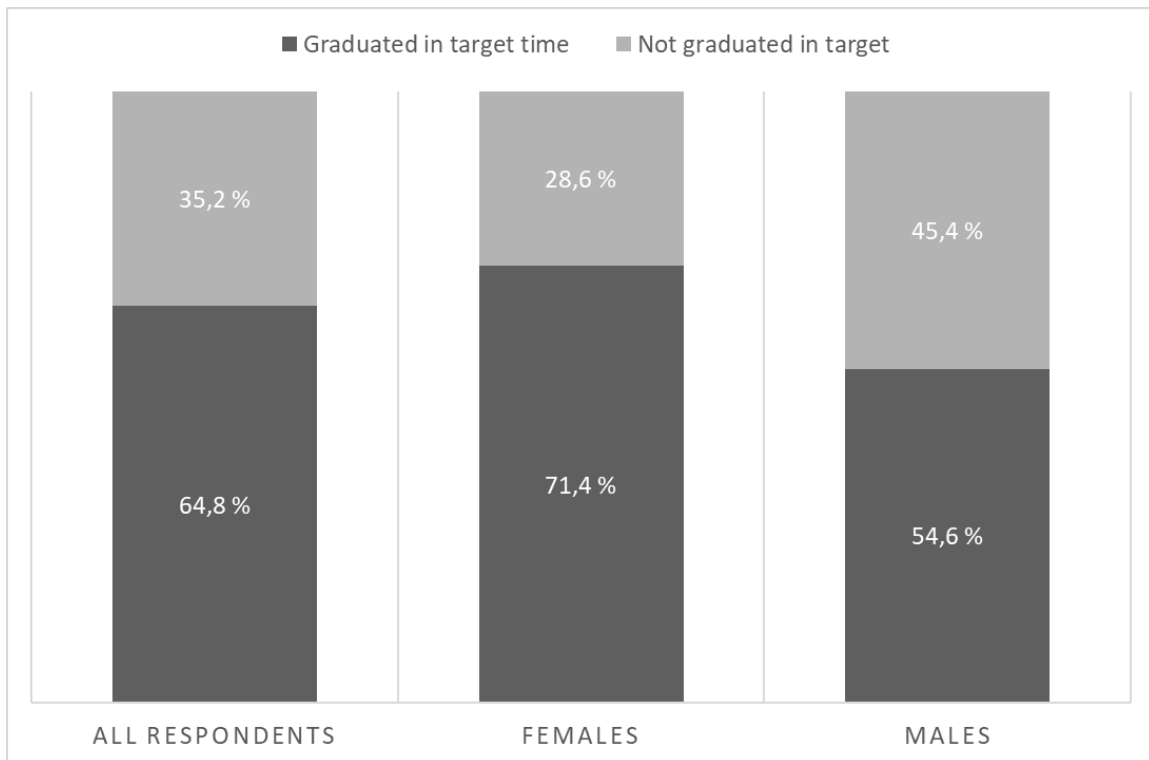
Figure 3. Graduation status of respondents

3.1 Fuzzy-sets, consistency, and coverage

Zadeh (1965) describes a fuzzy set as "a class of objects with a continuum of grades of membership". The usefulness of fuzzy sets arises from the fact that they allow researchers to calibrate partial membership in sets using values in the interval between zero (non-membership) and one (full membership) without abandoning other core set-theoretic principles. Fuzzy membership scores are used to address the varying degree to which case belongs to a set. A fuzzy membership value of one indicates full membership whereas the value of zero suggests non-membership in a set. Membership scores close to one (e.g., 0.8) indicate strong but not full membership in a set whereas values close to zero suggest that objects are more "out" than "in", but still members of a set. A membership score of 0.5 refers to the point of maximum ambiguity in the assessment of whether a case is more or less part of a set. (Rihoux & Ragin, 2009)

Fuzzy-set qualitative comparative analysis (FsQCA) is a method that can be used for obtaining linguistic summarizations from data that are associated with cases. FsQCA seeks to establish logical connections between causal conditions and an outcome. (Mendel & Korjani, 2013) Tóth et al. (2017) describe FsQCA as a powerful analytical approach to advance theory building as

well as for testing existing theories. They, however, note that FsQCA does not prove causal relationships between conditions and outcome, and therefore inferences about causal relationships should be based on theory.

Similarly, to the research conducted by Fernández-García et al. (2021) who utilised FsQCA, this thesis also investigates factors influencing student satisfaction via methods related to fuzzy logic. However, fuzzy-set qualitative comparative analysis (FsQCA) is not used due to a very large number of explanatory variables. Instead of FsQCA, timely graduation of UAS students is investigated with consistency and coverage measures which are also an essential part of qualitative comparative analysis. In this thesis, the two measures are used to test causal relationships between student satisfaction and single study-related statements. Previously mentioned limitations of FsQCA also apply with the utilised method.

According to Ragin (2006) consistency assesses the degree to which instances of an outcome agree in displaying the causal condition thought to be necessary, whereas coverage assesses the relevance of the causal condition. Schneider & Wagemann (2012) argue that consistency should always be assessed before coverage as if the condition is identified as inconsistent the calculation of coverage is meaningless. They also claim that the consistency value for a condition should be higher than 0.75 to be sufficient and add that coverage does not have a similar threshold value. A small value of coverage however indicates that only a small portion of the outcome can be explained by the condition. The formulas for consistency and coverage are:

$$\text{Consistency}(X_i \leq Y_i) = \sum(\min(X_i, Y_i))/\sum(X_i)$$

$$\text{Coverage}(X_i \leq Y_i) = \sum(\min(X_i, Y_i))/\sum(Y_i)$$

X_i represents the membership value of the condition or combination of conditions whereas Y_i represents the membership value of the outcome. In turn, "min" indicates the smaller membership value of the two values. (Rihoux & Ragin, 2009) Membership values of study satisfaction and explanatory variables are calculated with the following formulas:

$$
\text{Low(X)} = \begin{cases} 0 & ,X > 6 \\ \dfrac{6-X}{4} & ,2 \leq X \leq 6 \\ 1 & ,X < 2 \end{cases} \qquad High(X) = \begin{cases} 0 & ,X < 2 \\ \dfrac{X-2}{4} & ,2 \leq X \leq 6 \\ 1 & ,X > 6 \end{cases}
$$

X in the formulas represents the student's answer on a statement/question where one (very dissatisfied/completely disagree) is the minimum value and seven (very satisfied/totally agree) is the maximum value. In turn, Low(X) indicates the membership value of dissatisfaction/disagreement whereas High(X) indicates the membership value of satisfaction/agreement. All possible membership values of both membership functions are presented in Figure 4.

Calculation of two membership values for an answer enables the identification of factors that have an impact on both, satisfaction and dissatisfaction. In other words, in addition to examining which single conditions lead to high student satisfaction, conditions that lead to high student dissatisfaction are also identified.

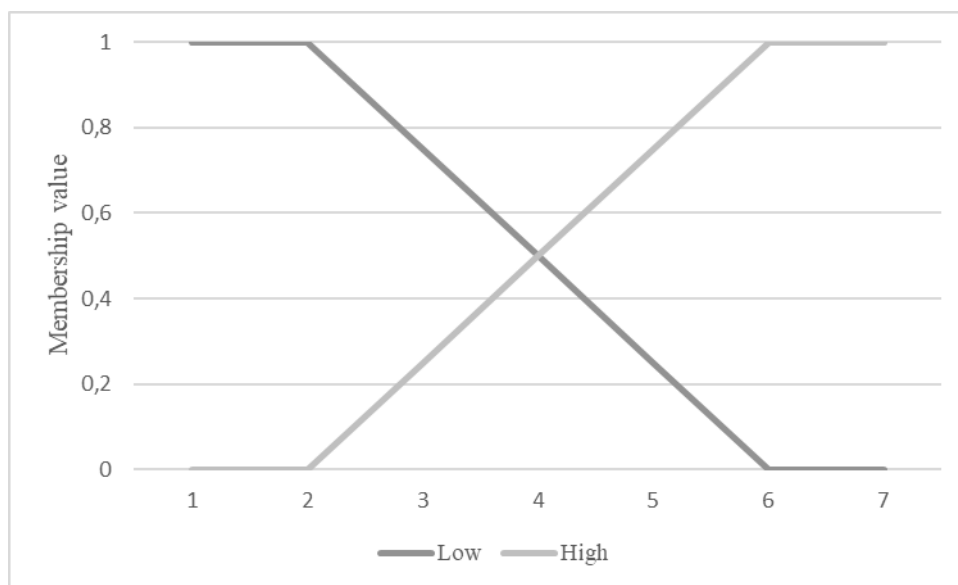
Figure 4. Membership values of the membership functions

In addition to calculating consistency and coverage values, student satisfaction is also investigated by utilising Welch's t-test (also known as unequal variance t-test). Welch's t-test

can be used for comparing the central tendencies of samples of two groups. The test does not assume equal variances and the t statistics can be calculated by following formula (Ruxton, 2006):

$$t = \frac{\mu_1 - \mu_2}{\sqrt{\dfrac{s_1^2}{n_1} - \dfrac{s_2^2}{n_2}}} \quad \begin{aligned} \mu_i &= mean\ of\ group\ i\ samples \\ s_i &= variance\ of\ group\ i\ samples \\ n_i &= size\ of\ group\ i\ samples \end{aligned}$$

In this thesis, Welch's t-test is utilised for comparing differences between females' and males' satisfaction levels.

3.2 Logistic regression

In this thesis, timely graduation is investigated by examining a binary variable. If a student has graduated within a target time the value of the variable is one (1), otherwise, the value of the variable is zero (0). As linear regression, which is a highly used method when studying timely graduation, is utilised for investigating continuous outcomes, it is not a suitable method for this analysis. Therefore, a similar but more fitting regression method is applied in this research. Logistic regression is a method that is suitable for examining binary events with one or more explanatory variables. In logistic regression the outcome is explained with the following formula:

$$Probability\ of\ outcome(Yi) = \frac{e^{\beta 0\ +\ \beta 1*Xi1\ +\ \dots\ \beta k\ *Xik}}{1\ +\ e^{\beta 0\ +\ \beta 1*Xi1\ +\ \dots\ \beta k\ *Xik}}$$

Ẏi represents the estimated probability of an observation being in one binary category instead of the other. In turn, $e^{\beta 0\ +\ \beta 1*Xi1\ +\ \dots\ \beta k*Xik}$ indicates the linear regression equation for independent variables expressed in the logit scale where β_k represents coefficient value for the independent variable and X_{ik} is the explanatory value of the independent variable. (Stoltzfus, 2011)

Due to estimation procedures of logistic regression, it does not require any distributional assumptions, unlike linear regression. However, there are still assumptions concerning logistic regression. Firstly, logistic regression assumes the independence of observations. In other

words, the observations should be independent of each other and should not come from repeated measurements. Secondly, logistic regression assumes the absence of multicollinearity. This means that independent variables should not be highly correlated with each other. Thirdly, logistic regression requires the independent variables to be linearly related to the log odds. Lastly, the general guideline with logistic regression is that there should be at least ten observations with the least frequent outcome for each independent variable. (Osborne, 2015; Schreiber-Gregory & Bader, 2018)

As the logistic regression analysis conducted in this thesis utilises only one independent variable at a time, the assumption about multicollinearity can be ignored. The large sample size of utilised dataset also means that there is enough observations for each outcome. Since the data represents comprehensively the Finnish UAS graduants and each student has answered the questionnaire only once, the assumption about the independence of observation can be assumed to be correct. Therefore, the only assumption that has to be tested is the assumption about the linearity of independent variables and log odds. This assumption will be tested with the Box-Tidwell test during the analysis.

Additionally, to support the results of the logistic regression analysis, Kruskal-Wallis test is utilised. Kruskal-Wallis test can be used for investigating whether two or more samples are from the same population. The test statistic is calculated by the following formula: (Kruskal & Wallis, 1952)

$$
H = \frac{\frac{12}{N(N+1)} \sum_{i=1}^{C} \frac{R_i^2}{n_i} - 3(N+1)}{1 - \frac{\sum t^3 - t}{N^3 - N}}
$$

C = the numer of groups
n_i = the number of observations in group i
N = the number of observations in all groups combined
R_i = the number of ranks in group i
t = the number of tied observations in group

In this thesis, Kruskal-Wallis test is used for comparing two samples: students who have graduated in the target time and students who graduated after the target time.

4   RESULTS

Factors affecting student satisfaction and timely graduation of Finnish UAS students were examined by utilising methods related to fuzzy logic and logistic regression analysis. As the size of the utilised dataset and the number of possible explanatory variables was extremely large, all results of the analysis are not presented in this thesis.

However, a more detailed analysis of results was conducted by utilizing Microsoft Power BI and publishing dashboards for the use of higher education institutes and the Finnish Ministry of Education and Culture. The published dashboards (Appendix 2) enable its users to examine timely graduation and student satisfaction from different perspectives as the analysed samples can be filtered with slicers. Additionally, the dashboard enables its user to examine how combinations of conditions affect student satisfaction. In this thesis paper conditions' (statements') influence on student satisfaction is examined only individually.

4.1   Factors affecting student satisfaction

Results of the set-theoretic analysis regarding satisfaction with "*education as a whole*" are presented in Table 4. The "education as a whole" satisfaction item was examined by utilising the question group variables which were constructed by calculating the mean value from the answers to each question groups' questions. The consistency values for the "low-low"-relationships between the satisfaction item and individual question group variables do not support the causal relationships. In other words, the results indicate that disagreement with the individual question group variables does not lead to dissatisfaction with education as a whole.

Table 4 shows also that all consistency values for the "high-high"-relationship are clearly over the threshold value of 0.75. Coverage values of all the variables are additionally very high and indicate that agreement with the variables leads to higher satisfaction levels. However, it is not reasonable to argue that all of the factors have a significant effect on student satisfaction. As none of the examined "low-low" relationships are supported, the question group variables cannot be used reliably to explain students' satisfaction with education as a whole. This finding suggests that hypotheses *H4* and *H5* cannot be accepted as variables *"learning environments"* and "*study content*" have only significant "high-high"-relationships with the satisfaction item.

In addition to investigating causal relationships between study-related statements and the student satisfaction item, the influence of gender on student satisfaction was examined by utilising Welch's t-test which compares the means of two populations. The results of the t-test indicate that there is a slight but significant difference between the student satisfaction levels of genders in favour of females with a 0.95 confidence level. Hence, *H6* is rejected.

Table 4. Consistency and coverage values regarding satisfaction with education as a whole

Variable	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
Study content	0.66	0.94	0.76	0.91
Planning studies, counselling	0.62	0.93	0.73	0.89
Teaching	0.61	0.95	0.82	0.87
Studying	0.70	0.91	0.61	0.94
Learning environments	0.59	0.92	0.70	0.88
Support services	0.54	0.93	0.74	0.84
Feedback and assessment	0.51	0.95	0.83	0.80
Internationality, multiculturalism, and language studies	0.52	0.90	0.63	0.86
Connection with the working life	0.46	0.96	0.86	0.75
Career services	0.44	0.95	0.84	0.73
Practical training	0.61	0.88	0.51	0.92
Thesis	0.54	0.92	0.69	0.85

4.1.1 Factors affecting satisfaction with teaching and guidance

Consistency and coverage values for the causal relationships between satisfaction with *teaching and guidance* and selected statements are presented in Appendix 3. The results indicate that all of the selected statements have a strong "high-high"-relationship with the examined satisfaction item as each consistency value is larger than 0.75 and coverage values are also reasonably high. Additionally, the statement "*The teachers were experts in their field*" has a significant "low-low"-relationship with the satisfaction item. However, the fairly low coverage value (0.45) concerning the relationship indicates that there are also other factors that cause dissatisfaction with teaching and guidance, but that were not examined in the analysis.

Surprisingly the results are not consistent with the findings of Martirosyan (2015) who argues that students are not satisfied if their individual learning differences are not considered. The results (Appendix 3) indicate that there is not enough evidence for the causal relationship "*if used educational and working methods do not take into account the differences in students' individual learning needs, they will be dissatisfied with teaching and guidance*" to be accepted. The consistency and coverage measures are however consistent with hypothesis *H2* and support the findings of Burgess et al. (2018), Mikulić et al. (2015), and Poon (2019) who found the quality of teaching to influence student satisfaction. Surprisingly, Welch's t-test indicates that unlike in the case of overall satisfaction, there is a clear difference between gender's mean satisfaction levels regarding teaching and guidance in favour of male students.

4.1.2   Factors affecting satisfaction with internationality during the studies

Based on the results of the analysis (Table 5) all of the five statements regarding internationality during the studies have a significant "high-high"-relationship with the satisfaction item. However, three of these statements do not reach the consistency threshold of 0.75 when examining "low-low"-relationships. The consistency measures suggest that there is not enough evidence to accept the "low-low"-relationship between the satisfaction item and statements *"the education given involved enhancing the students' ability to work in a multicultural environment", "the language studies offered were sufficient to meet the requirements of the working life",* and *"I had a chance to participate in diverse courses offered in foreign languages".*

Two statements that have also significant "low-low"-relationship with satisfaction with internationality during studies are "*my UAS offered good opportunities to carry out my practical training and/or study abroad*" and "*the education given involved enhancing the students' ability to work in a multicultural environment*". However, the reasonably low coverage values indicate that there are also other factors that have an influence on students' dissatisfaction with the item. In regards to differences between genders, Welch's t-test indicates that male students are more satisfied with the internationality of the studies with a confidence level of 0.95.

Table 5. Consistency and coverage values regarding satisfaction with internationality during the studies

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
The education given involved enhancing the students' ability to work in a multicultural environment.	0.74	0.82	0.64	0.88
The language studies offered were sufficient to meet the requirements of the working life.	0.67	0.78	0.54	0.86
I had a chance to participate in diverse courses offered in foreign languages.	0.66	0.82	0.66	0.82
The students were well-informed of the opportunities to carry out exchange studies or practical training abroad.	0.77	0.76	0.44	0.93
My UAS offered good opportunities to carry out my practical training and/or study abroad.	0.79	0.76	0.43	0.94

4.1.3 Factors affecting satisfaction with work relevance in studies

Students' satisfaction with work relevance in studies was examined from the perspective of 14 statements (Appendix 4). Despite a large number of explanatory variables none of them had a significant "low-low"-relationship with the examined satisfaction item. This suggests that none of the selected statements have an influence on dissatisfaction with work relevance in studies on their own. However, it is possible that a combination of the conditions would have a strong relationship with the satisfaction item.

As for the "high-high"-relationships, the consistency values of all of the statements were over 0.75. Results indicate that students were satisfied with work relevance especially when methods and content of studies responded to the requirements of working life. In turn, low coverage values of statements "*the expertise of alumni was successfully utilised in my studies*" and "*during my studies, I have received sufficient guidance, counselling and other information regarding entrepreneurship*" suggest that they do not explain high levels of satisfaction as well as the other statements. Similarly to overall student satisfaction, Welch's t-test indicates that females are more satisfied with work relevance in studies compared to males with a confidence level of 0.95.

4.1.4   Factors affecting satisfaction with career support

Unlike the cases of previous satisfaction items, Welch's t-test did not find a significant difference in males' and females' satisfaction levels regarding career support with a confidence level of 0.95. Results of the set-theoretic analysis regarding satisfaction with career support are presented in Appendix 5. Eight of the eleven statements did not have significant "low-low" and "high-high"-relationships with the satisfaction item. This suggests that the remaining three statements, *"the staff at my UAS has adequately supported me in networking with the working life", "I am satisfied with the professional connections I have made during my studies"*, and *"the expertise of the working life was successfully utilised in the operations of my UAS"* could be utilised for explaining students' satisfaction and dissatisfaction with career support. Coverage values of the three statements indicate that support received from UAS staff is the most relevant factor compared to others when examining satisfaction and dissatisfaction with career support.

4.1.5   Factors affecting satisfaction with practical training periods

Consistency and coverage values regarding satisfaction with practical training periods (Table 6) do not fully support findings of previous studies (Admi et al., 2018; Antohe et al., 2016; Fernández-García et al., 2021) which suggest that support and guidance received during practice has a significant effect on student satisfaction. Although the consistency values of "high-high"-relationships for the statements "*I received adequate support and guidance from my UAS regarding practical training*" and "*I received adequate support and guidance from the representatives from work regarding my practical training*" are significant, the values concerning "low-low"-relationship do not support the causal relationship. In other words, the analysis indicates that there is only significant evidence that the statements have a positive relationship in regard to satisfaction with practical training periods and therefore hypothesis *H7* is rejected.

However, the results of the analysis (Table 6) imply that personal development is a key factor regarding satisfaction with practical training periods. Consistency values of "low-low" and "high-high"-relationships indicate that statement "*my practical training strengthened my competence*" can be utilised to explain satisfaction and dissatisfaction with practical training. Still, the coverage value of the "low-low"-relationships imply that there are also other

conditions that cause high dissatisfaction with the satisfaction item. In addition, Welch's t-test suggests that females are more satisfied with practical training periods than males with a confidence level of 0.95 which in turn is consistent with the research of Fernández-García et al. (2021).

Table 6. Consistency and coverage values regarding satisfaction with practical training periods

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
I received adequate support and guidance from my UAS regarding practical training.	0.49	0.93	0.72	0.83
I received adequate support and guidance from the representatives from work regarding my practical training.	0.60	0.92	0.64	0.90
The collaboration between the working life and my UAS worked well during my practical training.	0.50	0.93	0.72	0.84
My practical training strengthened my competence.	0.82	0.89	0.47	0.98
During my practical training, I was able to apply what I had learned at my UAS in practice.	0.64	0.91	0.59	0.93
I believe that my practical training will help me find employment that is meaningful from the point of view of my studies.	0.71	0.90	0.56	0.95

4.1.6 Factors affecting satisfaction with thesis process

Consistency and coverage values regarding causal relationships between the thesis process and selected statements are presented in Table 7. The results of the analysis support findings of de Kleijn et al. (2012) who argued that students who perceive more affiliation from their supervisor are more satisfied with the thesis process. This is evident from the results which show that statement "*I received adequate support and guidance from my UAS regarding my thesis*" has strong and significant "low-low" and "high-high"-relationships with the satisfaction item. Although the importance of support received from the workplace does not have a strong relationship (no evidence for "low-low"-relationship), *H3* is still accepted as the received support clearly has an effect on satisfaction with the thesis process.

Table 7. Consistency and coverage values regarding satisfaction with thesis process

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
I received adequate support and guidance from my UAS regarding my thesis.	0.80	0.86	0.65	0.93
I received adequate support and guidance from the representatives from work regarding my thesis.	0.59	0.84	0.62	0.82
The collaboration between the working life and my UAS regarding my thesis worked well.	0.61	0.87	0.71	0.81
Peer evaluation I received from other students helped me with my thesis.	0.51	0.79	0.51	0.80
The thesis strengthened my competence.	0.81	0.81	0.47	0.95
My thesis gave me an opportunity to put into practice what I had learned in the UAS.	0.72	0.81	0.50	0.92
My thesis prepared me for work requiring expertise.	0.71	0.83	0.56	0.90
I believe that my thesis will help me find work related with my studies.	0.56	0.87	0.74	0.76

In addition to the received support, the results also emphasize the importance of the thesis topic for student satisfaction as statements "*the thesis strengthened my competence*" is significant in terms of satisfaction and dissatisfaction with thesis process. Additionally, Welch's t-test suggests that females are generally more satisfied with the thesis process than males with a confidence level of 0.95.

4.1.7 Factors affecting satisfaction with progression in competences

Results of the analysis regarding students' satisfaction with progression in competences are presented in Table 8. The consistency values indicate that none of the statements have a significant "low-low"-relationship with the satisfaction item. In turn, all of the consistency values concerning "high-high"-relationships between the satisfaction item and statements are larger than 0.75. This indicates that the statements can be utilised for explaining satisfaction with progression in competences. However, the coverage values suggest that statements *"the*

educational and working methods used took into account the differences in students' individual learning needs" and *"I received enough feedback on my development"* are not as relevant as the other statements. Furthermore, Welch's t-test implies that female students are more satisfied with progression on competences compared to their male counterpart with a confidence level of 0.95.

Table 8. Consistency and coverage values regarding satisfaction with progression in competences

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
I found my studies motivating and inspiring.	0.47	0.95	0.76	0.83
I was able to share the workload evenly throughout the degree if I wanted to.	0.37	0.90	0.54	0.82
The teachers were experts in their field.	0.50	0.93	0.66	0.87
The substance of my studies was well outlined and systematically presented.	0.47	0.94	0.71	0.85
Studying was motivating and inspiring.	0.47	0.95	0.80	0.82
The educational and working methods used took into account the differences in students' individual learning needs.	0.34	0.96	0.85	0.68
The study materials used were comprehensive, clear and concise.	0.40	0.95	0.79	0.77
The study materials were well available.	0.42	0.91	0.59	0.84
There was enough group work to help me develop my ability to work in groups.	0.51	0.89	0.41	0.92
Self-evaluation was effectively used to support the development of my competence.	0.37	0.95	0.80	0.74
I received enough feedback on my development.	0.34	0.96	0.85	0.68
My practical training strengthened my competence.	0.56	0.88	0.36	0.94
The thesis strengthened my competence.	0.50	0.91	0.53	0.90

4.1.8 Factors affecting satisfaction with professional development

Finally, students' satisfaction with professional development was examined from the perspective of nine statements (Table 9). Surprisingly, sufficient evidence for "low-low"-relationships were not found. As in the case of the analysis regarding satisfaction with work relevance in studies, this finding does not rule out the possibility that some of the factors can be utilised for explaining satisfaction with the examined item. However, the results suggest that none of the statements can explain satisfaction with professional development on their own.

Table 9. Consistency and coverage values regarding satisfaction with professional development

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
I was given sufficient opportunity to apply theory in practice.	0.40	0.94	0.70	0.82
The methods and tools used in my studies coincided with those used in the working life.	0.39	0.95	0.74	0.80
The working life was made good use of as a versatile learning environment in my studies.	0.36	0.95	0.74	0.77
During my studies, I have received sufficient knowledge regarding the practises of the working life (labour legislation, contract of employment, pay).	0.30	0.95	0.78	0.69
I received adequate support and guidance from my UAS regarding practical training.	0.38	0.94	0.70	0.80
I received adequate support and guidance from the representatives from work regarding my practical training.	0.42	0.92	0.56	0.87
During my practical training, I was able to apply what I had learned at my UAS in practice.	0.50	0.93	0.58	0.90
My thesis gave me an opportunity to put into practice what I had learned in the UAS.	0.42	0.93	0.60	0.86
My thesis prepared me for work requiring expertise.	0.40	0.93	0.64	0.83

As opposed to "low-low"-relationships, the results support "high-high"-relationships between all of the statements and the satisfaction item as all consistency values are greater than 0.75. However, because all of the statements have also reasonably high coverage values it is extremely difficult to make significant conclusions from these findings as there is also a lack of previous studies concerning students' satisfaction with professional development. One factor that was found to have an effect on the satisfaction item was gender. Welch's t-test suggests that males are less satisfied with their professional development compared to females with a confidence level of 0.95.

4.2 Factors affecting timely graduation

The impact of individual variables on timely graduation was examined by constructing logistic regression models for each explanatory variable individually. Similarly to the analysis concerning student satisfaction, the question group variables were utilised also for explaining timely graduation. Results of logistic regression analysis and Kruskal-Wallis test (Table 10) indicate that "*planning studies, counselling*" is the only question group variable that does not have a statistically significant effect on timely graduation. Two variables that have the biggest impact on timely graduation are "*practical training*" and *"study content"* which are the only variables that have a coefficient value larger than 0.1. Hence, *H1* is accepted.

Table 10. Coefficient and significance values of question group variables

Variable	Coefficient	p-value	p-value (Kruskal-Wallis)
Study content	0.13	< 0.05	< 0.05
Planning studies, counselling	0.01	0.27	0.10
Teaching	0.02	< 0.05	< 0.05
Studying	0.02	< 0.05	< 0.05
Learning environments	0.08	< 0.05	< 0.05
Support services	0.05	< 0.05	< 0.05
Feedback and assessment	0.02	< 0.05	< 0.05
Internationality, multiculturalism, and language studies	-0.09	< 0.05	< 0.05
Connection with the working life	0.06	< 0.05	< 0.05
Career services	0.04	< 0.05	< 0.05
Practical training	0.18	< 0.05	< 0.05
Thesis	0.06	< 0.05	< 0.05

The only variable that has a negative coefficient value is *"internationality, multiculturalism, and language studies"*. Although the rest of the variables are statistically significant their effect on timely graduation is almost negligible.

4.2.1 Influence of study content on timely graduation

As shown in Table 11, "*study content*" question group contains only two statements that do not have a statistically significant impact on timely graduation. The results of the logistic regression analysis suggest that emphasis given on theory and knowledge during studies as well as

students' ability to choose study contents based on their interests do not affect study duration. However, the opportunity to apply theory in practice and relevance of study content regarding working life seems to have a positive effect on timely graduation.

Table 11. Coefficient and significance values of statements concerning study content

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
Sufficient emphasis was given on theory and knowledge.	-0.01	< 0.05	0.08
I was given sufficient opportunity to apply theory in practice	0.08	< 0.05	< 0.05
My studies were challenging enough.	0.02	< 0.05	< 0.05
The amount of study credits I received corresponded well to my work load.	0.07	< 0.05	< 0.05
I found my studies motivating and inspiring.	0.14	< 0.05	< 0.05
I found my studies useful for my future	0.17	< 0.05	< 0.05
I was able to choose study contents in accordance with my personal interests.	-0.01	< 0.05	0.78
The content of my studies met the requirements of the working life.	0.07	< 0.05	< 0.05
My studies gave me a good understanding of the latest development in my field of study.	0.09	< 0.05	< 0.05
The methods and tools used in my studies coincided with those used in the working life.	0.07	< 0.05	< 0.05

The results also indicate that students who perceive their studies to be motivating, inspiring or useful for their future are much more likely to graduate in a timely manner than their counterparts. In other words, the findings suggest that it is important that students understand why the studied subject is relevant in the working life.

4.2.2   Influence of counselling and planning studies on timely graduation

Unlike statements concerning study content most statements of *planning studies, counselling* question group have only a small or non-existent impact on timely graduation according to the results of the logistic regression analysis (Table 12). This is consistent with the finding that *planning studies, counselling* variable does not have a statistically significant effect on timely graduation. The analysis suggests that statement "*My individual study plan guided and promoted my learning*" (coefficient value of 0.08) has the biggest influence of timely graduation regarding statements concerning counselling and planning studies. However, support in planning studies does not have a statistically significant effect on graduation time.

This implies that individual study plans help students in their study progress but extra support on planning studies does not have the same effect at the general level.

Table 12. Coefficient and significance values of statements concerning planning studies and counselling

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
It was clear what was expected of me in my studies.	0.06	< 0.05	< 0.05
The content of my studies corresponded to the content given in the curriculum.	-0.04	< 0.05	< 0.05
Required course assignments and prerequisites for study units were clearly brought to everyone's attention.	-0.02	< 0.05	< 0.05
My prior learning and know-how (RPL/AHOT) was well acknowledged in my studies.	0.04	< 0.05	< 0.05
Course scheduling was workable (timing, sufficient course supply).	-0.05	< 0.05	< 0.05
In general, my studies did not include unnecessary study units, futile overlap or repetition.	-0.05	< 0.05	< 0.05
My studies complimented each other and worked well together as a whole.	0.05	< 0.05	< 0.05
My individual study plan guided and promoted my learning.	0.08	< 0.05	< 0.05
I was able to share the workload evenly throughout the degree if I wanted to.	-0.01	< 0.05	0.67
The course supply at my UAS enabled round-the-year studies.	0.03	< 0.05	< 0.05
I got enough support in planning my studies.	0.00	0.29	0.54
I received high quality study guidance.	-0.04	< 0.05	< 0.05

Students who have a clear understanding of what is expected from them in their studies and who think that studies complement each other and work well together as a whole are also more likely to graduate in a timely manner. Surprisingly, students who perceive course scheduling to be workable and think that the content of their studies corresponds to the content given in the curriculum are less likely to graduate in target time according to the results. Similarly, statements "*in general, my studies did not include unnecessary study units, futile overlap or repetition*" and "*I received high quality study guidance*" have a negative effect on timely graduation. However, a rational explanation for this might be that struggling students require more study guidance and that unnecessary and repetitive study units are easier to complete based on knowledge acquired during previous study units.

4.2.3   Influence of teaching on timely graduation

According to the results of the logistic regression analysis (Table 13), the only statement of question group "*teaching*" that has a substantial impact on timely graduation is "*studying was motivating and inspiring*" (coefficient value of 0.11). This finding is consistent with the results regarding the statements concerning study content. Based on the results, availability and quality of the study materials, used working methods, presented substance of the studies, and expertise of teachers have an only minor or statistically insignificant effect on timely graduation. This is not surprising as these factors are more likely to affect the quality of the studies than study duration.

Table 13. Coefficient and significance values of statements concerning teaching

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
The teachers were experts in their field.	0.01	0.21	0.47
The substance of my studies was well outlined and systematically presented.	-0.03	< 0.05	< 0.05
The substance of my studies was clearly and understandably presented.	0.00	0.72	0.90
Studying was motivating and inspiring.	0.11	< 0.05	< 0.05
The educational and working methods used were versatile and well-suited for each study context.	0.03	< 0.05	< 0.05
The educational and working methods used took into account the differences in students' individual learning needs.	0.02	< 0.05	< 0.05
The study materials used were comprehensive, clear and concise.	0.00	0.70	0.99
The study materials were well available.	-0.01	< 0.05	< 0.05

4.2.4   Influence of studying on timely graduation

As Table 14 shows only one of the statements concerning question group "*studying*" is statistically insignificant regarding timely graduation. However, most of the statistically significant statements have only a very small influence on the time taken to graduate. Nevertheless, according to the analysis, students who perceived that they were encouraged to actively participate in lessons and think that there was enough interaction and discussion in their studies are more likely to graduate in target time. Surprisingly, the statement "*there was a right amount of self-studying*" (coefficient value of -0.04) has a negative impact on timely

graduation. This finding is inconsistent with the study of Schmidt et al. (2010) who found that higher levels of self-study lead to faster graduation.

Table 14. Coefficient and significance values of statements concerning studying

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
Cooperation with the teachers was easy and natural.	0.01	0.08	0.08
The students were encouraged to actively participate in lessons.	0.06	< 0.05	< 0.05
The teachers took all students equally and fairly into account.	-0.03	< 0.05	< 0.05
Enough consideration was given for discussion on important topics.	0.02	< 0.05	< 0.05
There was a right amount of self-studying.	-0.04	< 0.05	< 0.05
There was enough group work to help me develop my ability to work in groups.	0.04	< 0.05	< 0.05
There was enough interaction and discussion in my studies.	0.05	< 0.05	< 0.05
My studies allowed me to develop my public presentation skills.	0.04	< 0.05	< 0.05

4.2.5 Influence of learning environments on timely graduation

Table 15. Learning environments

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
The students and staff formed a close-knit community, which I felt a part of.	0.06	< 0.05	< 0.05
The students supported one another and tried to help each other out when necessary.	0.12	< 0.05	< 0.05
I felt part of the student community.	0.11	< 0.05	< 0.05
The teaching and learning facilities were versatile and appropriate for different learning contexts.	-0.05	< 0.05	< 0.05
The opportunities of e-learning were made good use of.	0.06	< 0.05	< 0.05
The working life was made good use of as a versatile learning environment in my studies.	0.09	< 0.05	< 0.05
The students had access to comfortable facilities for group work and self-studying.	-0.07	< 0.05	< 0.05
Versatile learning environments (e.g. laboratories, simulation environments) have promoted my learning.	0.01	< 0.05	< 0.05

Table 15 shows that all statements of "*learning environments*" question group have a statistically significant impact on timely graduation. Analysis suggests that students who felt

like being part of the student community and who perceived that students supported one another and tried to help each other out when necessary are much more likely to graduate in a timely manner. This implies that it is important that HEIs try to create and maintain a good atmosphere within the student community.

In addition to this, statements *"the students and staff formed a close-knit community, which I felt a part of"*, "*the opportunities of e-learning were made good use of"* and "*the working life was made good use of as a versatile learning environment in my studies"* have a substantial and positive effect on timely graduation. Surprisingly, statements regarding facilities of HEIs have a negative impact on graduation time.

4.2.6 Influence of support services on timely graduation

Based on the results of the logistic regression analysis (Table 16) all of the statements concerning support services are statistically significant but only two of them affect timely graduation substantially. Analysis suggests that students who recognized that their study progress was monitored actively and who think that they were offered sufficient support for meeting goals they had set for themselves are more likely to graduate in target time.

Table 16. Support services

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
The IT and software services offered were functional (sufficient and up-to-date).	-0.01	< 0.05	< 0.05
The library and IT services supported my learning.	0.03	< 0.05	< 0.05
The progress of my studies was actively monitored.	0.05	< 0.05	< 0.05
Sufficient support was offered to help me meet the goals in educational attainment I had set myself.	0.06	< 0.05	< 0.05
There was sufficient amount of information and support available in issues regarding my well-being.	0.03	< 0.05	< 0.05
The activities and services provided by the student union helped me with my studies.	-0.01	< 0.05	< 0.05

4.2.7 Influence of feedback and assessment on timely graduation

Table 17 shows that three of the seven statements concerning feedback and assessment are statistically insignificant. Feedback on students' development, active evaluation of learning process, and informativeness of feedback do not have an influence on timely graduation

according to the analysis. "*Self-evaluation was effectively used to support the development of my competence*" (coefficient value of 0.05) is the only statement related to feedback and assessment that affects timely graduation considerably.

Table 17. Feedback and assessment

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
The assessment criteria used were clear.	-0.02	< 0.05	< 0.05
The assessment I received was well in line with my learning results.	0.04	< 0.05	< 0.05
In addition to learning results, my learning process was also actively evaluated.	0.00	0.76	0.29
Self-evaluation was effectively used to support the development of my competence.	0.05	< 0.05	< 0.05
Peer evaluation was successfully used to help me develop as a recipient and a provider of feedback.	0.04	< 0.05	< 0.05
The feedback I received helped me find out about the things I had not understood.	0.00	0.75	0.71
I received enough feedback on my development.	0.00	0.47	0.11

4.2.8   Influence of internationality, multiculturalism, and language studies on timely graduation

Table 18. Internationality, multiculturalism, and language studies

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
The education given involved enhancing the students' ability to work in a multicultural environment.	-0.04	< 0.05	< 0.05
The language studies offered were sufficient to meet the requirements of the working life.	-0.05	< 0.05	< 0.05
I had a chance to participate in diverse courses offered in foreign languages.	-0.09	< 0.05	< 0.05
The students were well-informed of the opportunities to carry out exchange studies or practical training abroad.	-0.03	< 0.05	< 0.05
My UAS offered good opportunities to carry out my practical training and/or study abroad.	-0.03	< 0.05	< 0.05

As presented in Table 18 all five statements concerning internationality, multiculturalism, and language studies are statistically significant and have a negative effect on timely graduation.

Especially statements "*I had a chance to participate in diverse courses offered in foreign languages*" (coefficient value -0.09) and "*the language studies offered were sufficient to meet the requirements of the working life*" (coefficient value of -0.05) have a substantial influence on graduation time. The reason for this is most likely that students who studied abroad are likely to take more time with their studies and agree with the statements. The statement *"my UAS offered good opportunities to carry out my practical training and/or study abroad"* (coefficient value of -0.03) has similarly negative but much smaller effect on timely graduation.

4.2.9   Influence of connections with the working life with timely graduation

According to the results of the logistic regression analysis students who are satisfied with the professional connections they made during their studies are much more likely to graduate in a timely manner than their counterparts (Table 19). Statement "*the expertise of the working life was successfully utilised in the operations of my UAS*" (coefficient value of 0.05) has also a positive influence on timely graduation based on the logistic regression analysis. In turn, the rest of the statements of the "*connections with the working life*" question group have only a trivial effect on graduation time.

Table 19. Connections with the working life

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
The staff at my UAS has adequately supported me in networking with the working life.	0.03	< 0.05	< 0.05
I am satisfied with the professional connections I have made during my studies.	0.14	< 0.05	< 0.05
The expertise of the working life was successfully utilised in the operations of my UAS.	0.05	< 0.05	< 0.05
The expertise of alumni was successfully utilised in my studies.	-0.03	< 0.05	< 0.05
I was offered enough possibilities to participate in studies that included cooperation with working life.	0.04	< 0.05	< 0.05
In my opinion, the staff at my UAS is well acquainted with contemporary working life.	-0.02	< 0.05	< 0.05

4.2.10 Influence of career services on timely graduation

Statement "*I know well where and how to apply for jobs suitable for me and how to find employment*" (coefficient value of 0.1) is the only statement regarding career services that has a substantial influence on timely graduation (Table 20). This suggests that students who have

sufficient knowledge regarding applying for a job are more likely to graduate in a timely manner. A possible explanation for this is that students who agree with the statement are able to find a practical training position faster and therefore also graduate at a faster pace.

Table 20. Career services

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
I have received adequate support in career planning in my studies.	0.04	< 0.05	< 0.05
I know well where and how to apply for jobs suitable for me and how to find employment.	0.10	< 0.05	< 0.05
During my studies, I have received sufficient knowledge regarding the practises of the working life (labour legislation, contract of employment, pay).	0.04	< 0.05	< 0.05
During my studies, I have been sufficiently instructed on how to effectively apply for work (job application, CV, job interviews).	-0.03	< 0.05	< 0.05
During my studies, I have received sufficient guidance, counselling and other information regarding entrepreneurship.	-0.02	< 0.05	< 0.05

4.2.11 Influence of practical training on timely graduation

As presented in Table 10 "*practical training*" question group has the biggest impact on timely graduation of all the question groups with a coefficient value of 0.18. Table 21 supports this finding as all the statements regarding practical training have a substantial influence on graduation time. The results suggest that students who are able to apply what they have learned during their studies in practice and who find practical training to strengthen their competences and to be useful in the future are much more likely to graduate in target time.

The results of the logistic regression analysis also imply that support and guidance received from both, UAS and representatives from work, have a significant impact on timely graduation. Furthermore, the analysis suggests that successful collaboration between UAS and the working life has a positive impact on graduation time as the statement "*the collaboration between the working life and my UAS worked well during my practical training*" has a coefficient value of 0.07.

Table 21. Practical training

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
I received adequate support and guidance from my UAS regarding practical training.	0.06	< 0.05	< 0.05
I received adequate support and guidance from the representatives from work regarding my practical training.	0.10	< 0.05	< 0.05
The collaboration between the working life and my UAS worked well during my practical training.	0.07	< 0.05	< 0.05
My practical training strengthened my competence.	0.15	< 0.05	< 0.05
During my practical training, I was able to apply what I had learned at my UAS in practice.	0.17	< 0.05	< 0.05
I believe that my practical training will help me find employment that is meaningful from the point of view of my studies.	0.13	< 0.05	< 0.05

4.2.12 Influence of thesis process on timely graduation

Table 22. Thesis

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
I received adequate support and guidance from my UAS regarding my thesis.	-0.02	< 0.05	< 0.05
I received adequate support and guidance from the representatives from work regarding my thesis.	0.01	< 0.05	< 0.05
The collaboration between the working life and my UAS regarding my thesis worked well.	0.01	0.08	< 0.05
Peer evaluation I received from other students helped me with my thesis.	0.11	< 0.05	< 0.05
The thesis strengthened my competence.	0.05	< 0.05	< 0.05
My thesis gave me an opportunity to put into practice what I had learned in the UAS.	0.04	< 0.05	< 0.05
My thesis prepared me for work requiring expertise.	0.05	< 0.05	< 0.05
I believe that my thesis will help me find work related with my studies.	0.01	< 0.05	< 0.05

Table 22 shows that only three statements regarding the thesis process have a substantial influence on timely graduation. This is not surprising as "*thesis*" question group has a quite small influence on graduation time (Table 10). The results indicate that helpful peer evaluation received from other students has a major effect on timely graduation. On the other hand, the results suggest that support and guidance received from work or UAS does not have a

substantial effect on graduation time. These findings imply that support and feedback received from other students during the thesis process is much more important than guidance received from the workplace or UAS in terms of time taken to graduate.

Additionally, the results of the analysis indicate that students who perceived that the thesis strengthened their competences and prepared them for work requiring expertise are more likely to graduate in a timely manner. These findings are consistent with the results presented in Table 11 which suggest that students who perceive their studies to be motivating, inspiring or useful for their future are more likely to graduate in target time.

4.2.13 Influence of student satisfaction on timely graduation

As presented in Table 23 all of the factors regarding student satisfaction have a statistically significant effect on timely graduation. However, two of the factors, "*teaching, guidance*", and "*thesis*", have only negligible influence on the examined phenomenon.

Table 23. General satisfaction

Factor	Coefficient	p-value	p-value (Kruskal-Wallis)
Teaching, guidance	-0.01	< 0.05	< 0.05
Internationality during the studies	-0.08	< 0.05	< 0.05
Work relevance in my studies	0.08	< 0.05	< 0.05
Career support	0.08	< 0.05	< 0.05
Practical training periods	0.15	< 0.05	< 0.05
Thesis process	0.02	< 0.05	< 0.05
My progression in competences	0.18	< 0.05	< 0.05
My professional development	0.20	< 0.05	< 0.05
My education as a whole	0.14	< 0.05	< 0.05

The results suggest that students who are satisfied with "*education as a whole*", "*progression in competences*", "*professional development*", or "*practical training periods*" are much more likely to graduate in a target time compared to students who are not satisfied with these factors. In fact, satisfaction with *professional development* (coefficient value of 0.20) has the biggest individual effect on timely graduation of all the presented factors.

In addition, satisfaction with "*career support*" and "*work relevance in studies*" have also a positive and substantial influence on graduation in target time. In turn, satisfaction with

"internationality during studies" has a negative impact on timely graduation which is consistent with results presented in Table 18.

5   CONCLUSIONS AND SUMMARY

The objective of this master's thesis was to identify study-related factors that have an influence on student satisfaction and timely graduation. To achieve this objective, seven research questions were constructed based on the previous research on the subject in order to investigate findings that are supported by earlier studies. The first research hypothesis of the study was:

1. *Good planning of studies has an influence on timely graduation*

This hypothesis was supported by earlier findings of several studies (Aina et al., 2011; Haarala-Muhonen et al., 2017; Schmidt et al., 2010). The validity of the hypothesis was examined with logistic regression analysis. Results of the analysis indicate that the factor *planning studies, counselling* has significant and the second-highest effect on timely graduation of all constructed factors. Due to this, *H1* is accepted. Additionally, the relationship between statements regarding planning of studies and timely graduation was examined. This analysis identified individual study plans and clarity of the studies' objectives as important factors in relation to timely graduation.

As timely graduation has not been studied much from the perspective of students' own experiences during studies, another research hypothesis regarding timely graduation was not constructed. Therefore, the second research hypothesis was:

2. *Perceived teaching quality affects student satisfaction*

The set-theoretic analyses regarding general student satisfaction and satisfaction with progression in competences suggest that quality of teaching has a significant impact on the two satisfaction items. The results indicate that perceived low teaching quality leads to dissatisfaction, whereas perceived high teaching quality leads to satisfaction with the identified satisfaction items. These findings are consistent with previous findings on the subject (Martirosyan, 2015; Mikulić et al., 2015; Burgess et al., 2018; Poon, 2019) and therefore *H2* is also accepted.

Due to a previous study conducted by de Kleijn et al. (2012) which found the student-supervisor relationship to have a significant impact on student satisfaction, the third research hypothesis was:

3. *The support received during the thesis process has an influence student satisfaction*

High consistency and coverage values of the statement "*I received adequate support and guidance from my UAS regarding my thesis*" support the findings of de Kleijn et al. (2012) and suggest that the support received during the thesis process can cause dissatisfaction or satisfaction depending on how students perceive the received support. Hence *H3* is accepted. Additionally, the analysis identifies the subject of the thesis as an important factor regarding to student satisfaction.

Another factor that has been found to have a significant impact on student satisfaction in previous studies is the students' opinion on the content of studies (Gruber et al., 2010; Mikulić et al., 2015; Poon, 2019). Therefore, the fourth research hypothesis of the thesis was:

4. *Perception of study content has an impact on student satisfaction*

The conducted causal relationship analysis indicates that there is not enough evidence to accept the hypothesis as students' answers concerning statements regarding study content did not have consistent relationship with dissatisfaction of education as a whole. The results suggest that students who agree with statements concerning study content are more likely to be satisfied with their studies, but as the other examined relationship was not found to be reliable, *H4* is rejected.

As multiple researchers (Gruber et al., 2010; Kärnä et al., 2013; Hanssen & Solvoll, 2015; Kärnä & Julin, 2015) have found HEIs' infrastructure, especially social areas, to have a significant impact on student satisfaction the fifth research hypothesis was defined as:

5. *The infrastructure of HEIs has an influence on student satisfaction*

The calculated consistency and coverage measures suggest that students who agree with the statements regarding learning environments are more likely to be satisfied with their studies. However, *H5* cannot be accepted as the conducted analysis indicates that there is not enough significant enough evidence for the causal relationship "*if students disagree with the statements concerning learning environments they are dissatisfied with education as a whole*".

Additionally, many studies (Garcia-Aracil, 2009; Martirosyan, 2015; Poon, 2019) have found males to be more satisfied with their education as a whole compared to females. Thus, the sixth research hypothesis of the thesis was:

6. *Males are more satisfied with their studies than females*

This research hypothesis was tested with all satisfaction items by utilising Welch's t-test. The analysis indicates that male students are more satisfied with items *teaching and guidance* and *internationality during* studies compared to female students. However, the Welch's t-test suggests that females are more satisfied with *the education as a whole*, *work relevance in studies*, *practical training periods*, *thesis process*, *progression in competences*, and *professional development*. Therefore, *H6* is rejected.

Lastly, as study conducted by Fernández-García et al. (2021) suggested that there is relationship between satisfaction with training periods and received support the seventh and last research hypothesis was defined as

7. *Students who have received an adequate amount of support and guidance during their practical training are more satisfied with their training periods*

Surprisingly, the results of the causality analysis do not support the hypothesis as the consistency values indicate that low levels of support and guidance during practical training do not affect student satisfaction negatively. Thus, *H7* is rejected. However, the analysis implies that there is strong relationship between the satisfaction item and statements "*My practical training strengthened my competence*" and "*I believe that my practical training will help me find employment that is meaningful from the point of view of my studies*".

5.1 Theoretical contributions

In addition to supporting findings of previous studies, the results of this thesis indicate that there are multiple factors that have a significant impact on student satisfaction and timely graduation which have not been examined comprehensively by researchers. In terms of student satisfaction, the conducted analysis highlights that students consider the internationality of their studies as an important factor. In other words, HEIs need to offer opportunities to complete part of studies in abroad in order to keep students satisfied with internationality of studies. However, the analysis suggests that there is not relationship between internationality of the studies and dissatisfaction with the education overall. Similarly, the results presented in the thesis imply that received support and knowledge regarding working life affects student's opinion of career support offered by HEIs but does not cause dissatisfaction with the education as a whole.

As stated earlier, the conducted causality analysis indicates that practical training has a significant impact on students' overall satisfaction with the education. Furthermore, the results stress out that the practical training should be completed in workplace that is relevant regarding to the studies. Therefore, HEIs should participate in finding a suitable practical training place for students if they see students' overall satisfaction with received education as an important indicator. The analysis also identified teachers' expertise, the amount of group work, and the meaningfulness of studying as significant factors regarding students' satisfaction with progression in competences. These results suggest that HEIs should encourage teachers to keep track of the development of their field to maintain their knowledge of it. As students see group working skills as an important asset, it is also advised to assess whether the studies contain enough team working activities.

In the matter of timely graduation, the conducted logistic regression analysis implies that students who agree with the statements regarding practical training are much more likely to graduate in a timely manner compared to students who disagree with the statements. Furthermore, the statement-specific analysis indicates that especially students who were able to apply what they had learned during their studies in practice and who found practical training to strengthen their competences and to be useful in the future were much more likely to graduate in target time. Naturally, it is difficult to understand how these factors could influence

graduation time on their own. These findings are most likely explained by indirect factors. It is possible that students who have problems with finding training place have to settle with workplace that is not relevant for their studies. This would explain why students who disagree with the statements concerning practical training are more likely to graduate after target time.

Another factor that has significant impact on timely graduation on its own is internationality, multiculturalism, and language studies. The results of the logistic regression analysis suggest that this factor has a negative effect on the probability of timely graduation. Reason for this is most likely that students who complete part of their studies abroad are likely to agree with the statements regarding the subject. It is reasonable to assume that exchange studies have at least minor slowing effect on study progress which in turn lowers the probability of timely graduation. In order to mitigate the possible effect of exchange studies, HEIs could for example offer students an opportunity to complete some courses remotely if it is not yet possible.

5.2 Future research

As the influence of different factors on timely graduation and student satisfaction was examined only individually, the importance of some factors may have been unnoticed. Therefore, research that takes account combinatory effects of different study-related factors is still needed. Additionally, the impact of demographic factors was mostly ignored in this study. Hence, more detailed analysis that examines both, demographic and study-related factors, could reveal some new insights on the subject. The results of this thesis do not also represent the whole Finnish higher education system as the study focuses on UAS graduates. Therefore, an analysis that examines students from multiple Finnish universities is needed to understand better factors affecting student satisfaction and timely graduation in Finnish higher education setting.

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APPENDICES

Appendix 1. AVOP feedback questionnaire

Question / statement	Multiple choise options	Question group
Age	1. Under 25 2. 25-34 3. 35-45 4. Over 45	Background information
Gender	1. Women 2. Men 3. Other / prefer not to answer	Background information
Basic education	1. Matriculation / baccalaureate / A levels 2. Vocational qualification or equivalent 3. Matriculation / baccalaureate and vocational qualification 4. College-level or post-secondary non-university diploma 5. Higher education degree 6.Foreign diploma / degree 7. No degree / diploma after basic education	Background information
Sufficient emphasis was given on theory and knowledge.	Scale 1-7: 1 = completely disagree 4 = neither agree nor disagree 7 = completely agree	Study content
I was given sufficient opportunity to apply theory in practice	Scale 1-7	Study content
My studies were challenging enough.	Scale 1-7	Study content
The amount of study credits I received corresponded well to my work load.	Scale 1-7	Study content
I found my studies motivating and inspiring.	Scale 1-7	Study content
I found my studies useful for my future	Scale 1-7	Study content
I was able to choose study contents in accordance with my personal interests.	Scale 1-7	Study content
The content of my studies met the requirements of the working life.	Scale 1-7	Study content
My studies gave me a good understanding of the latest development in my field of study.	Scale 1-7	Study content

The methods and tools used in my studies coincided with those used in the working life.	Scale 1-7	Study content
It was clear what was expected of me in my studies.	Scale 1-7	Planning studies, counselling
The content of my studies corresponded to the content given in the curriculum.	Scale 1-7	Planning studies, counselling
Required course assignments and prerequisites for study units were clearly brought to everyone's attention.	Scale 1-7	Planning studies, counselling
My prior learning and know-how (RPL/AHOT) was well acknowledged in my studies.	Scale 1-7	Planning studies, counselling
Course scheduling was workable (timing, sufficient course supply).	Scale 1-7	Planning studies, counselling
In general, my studies did not include unnecessary study units, futile overlap or repetition.	Scale 1-7	Planning studies, counselling
My studies complimented each other and worked well together as a whole.	Scale 1-7	Planning studies, counselling
My individual study plan guided and promoted my learning.	Scale 1-7	Planning studies, counselling
I was able to share the workload evenly throughout the degree if I wanted to.	Scale 1-7	Planning studies, counselling
The course supply at my UAS enabled round-the-year studies.	Scale 1-7	Planning studies, counselling
I got enough support in planning my studies.	Scale 1-7	Planning studies, counselling
I received high quality study guidance.	Scale 1-7	Planning studies, counselling
The teachers were experts in their field.	Scale 1-7	Teaching
The substance of my studies was well outlined and systematically presented.	Scale 1-7	Teaching
The substance of my studies was clearly and understandably presented.	Scale 1-7	Teaching
Studying was motivating and inspiring.	Scale 1-7	Teaching
The educational and working methods used were versatile and well-suited for each study context.	Scale 1-7	Teaching

| The educational and working methods used took into account the differences in students' individual learning needs.	Scale 1-7	Teaching
The study materials used were comprehensive, clear and concise.	Scale 1-7	Teaching
The study materials were well available.	Scale 1-7	Teaching
Cooperation with the teachers was easy and natural.	Scale 1-7	Studying
The students were encouraged to actively participate in lessons.	Scale 1-7	Studying
The teachers took all students equally and fairly into account.	Scale 1-7	Studying
Enough consideration was given for discussion on important topics.	Scale 1-7	Studying
There was a right amount of self-studying.	Scale 1-7	Studying
There was enough group work to help me develop my ability to work in groups.	Scale 1-7	Studying
There was enough interaction and discussion in my studies.	Scale 1-7	Studying
My studies allowed me to develop my public presentation skills.	Scale 1-7	Studying
The students and staff formed a close-knit community, which I felt a part of.	Scale 1-7	Learning environments
The students supported one another and tried to help each other out when necessary.	Scale 1-7	Learning environments
I felt part of the student community.	Scale 1-7	Learning environments
The teaching and learning facilities were versatile and appropriate for different learning contexts.	Scale 1-7	Learning environments
The opportunities of e-learning were made good use of.	Scale 1-7	Learning environments
The working life was made good use of as a versatile learning environment in my studies.	Scale 1-7	Learning environments
The students had access to comfortable facilities for group work and self-studying.	Scale 1-7	Learning environments
Versatile learning environments (e.g. laboratories, simulation	Scale 1-7	Learning environments

environments) have promoted my learning.		
The IT and software services offered were functional (sufficient and up-to-date).	Scale 1-7	Support services
The library and IT services supported my learning.	Scale 1-7	Support services
The progress of my studies was actively monitored.	Scale 1-7	Support services
Sufficient support was offered to help me meet the goals in educational attainment I had set myself.	Scale 1-7	Support services
There was sufficient amount of information and support available in issues regarding my well-being.	Scale 1-7	Support services
The activities and services provided by the student union helped me with my studies.	Scale 1-7	Support services
The assessment criteria used were clear.	Scale 1-7	Feedback and assessment
The assessment I received was well in line with my learning results.	Scale 1-7	Feedback and assessment
In addition to learning results, my learning process was also actively evaluated.	Scale 1-7	Feedback and assessment
Self-evaluation was effectively used to support the development of my competence.	Scale 1-7	Feedback and assessment
Peer evaluation was successfully used to help me develop as a recipient and a provider of feedback.	Scale 1-7	Feedback and assessment
The feedback I received helped me find out about the things I had not understood.	Scale 1-7	Feedback and assessment
I received enough feedback on my development.	Scale 1-7	Feedback and assessment
In your opinion, was the students' feedback taken into consideration in developing the studies? The feedback was taken into consideration	1. to a great extent 2. to a good extent 3. to some extent 4. only a little 5. not at all	Feedback and assessment
How frequently were you given the chance to give course feedback?	1. On all or nearly all of the courses (81-100% of the courses) 2. On most of the courses (61-80% of the courses)	Feedback and assessment

	3. On approximately every second course (41-60% of the courses) 4. On only some of the courses (21-40% of the courses) 5. Feedback was collected very infrequently or never (0-20% of the courses)	
The education given involved enhancing the students' ability to work in a multicultural environment.	Scale 1-7	Internationality, multiculturalism, and language studies
The language studies offered were sufficient to meet the requirements of the working life.	Scale 1-7	Internationality, multiculturalism, and language studies
I had a chance to participate in diverse courses offered in foreign languages.	Scale 1-7	Internationality, multiculturalism, and language studies
The students were well-informed of the opportunities to carry out exchange studies or practical training abroad.	Scale 1-7	Internationality, multiculturalism, and language studies
My UAS offered good opportunities to carry out my practical training and/or study abroad.	Scale 1-7	Internationality, multiculturalism, and language studies
Did your UAS offer the chance to participate in international courses as, for example, e-learning or project-based learning?	1. Yes, sufficiently so. 2. Yes, but too little in my opinion. 3. Not that I am aware of.	Internationality, multiculturalism, and language studies
The staff at my UAS has adequately supported me in networking with the working life.	Scale 1-7	Connections with the working life
I am satisfied with the professional connections I have made during my studies.	Scale 1-7	Connections with the working life
The expertise of the working life was successfully utilised in the operations of my UAS.	Scale 1-7	Connections with the working life
The expertise of alumni was successfully utilised in my studies.	Scale 1-7	Connections with the working life
I was offered enough possibilities to participate in studies that included cooperation with working life.	Scale 1-7	Connections with the working life
In my opinion, the staff at my UAS is well acquainted with contemporary working life.	Scale 1-7	Connections with the working life

I have received adequate support in career planning in my studies.	Scale 1-7	Career services
I know well where and how to apply for jobs suitable for me and how to find employment.	Scale 1-7	Career services
During my studies, I have received sufficient knowledge regarding the practises of the working life (labour legislation, contract of employment, pay).	Scale 1-7	Career services
During my studies, I have been sufficiently instructed on how to effectively apply for work (job application, CV, job interviews).	Scale 1-7	Career services
During my studies, I have received sufficient guidance, counselling and other information regarding entrepreneurship.	Scale 1-7	Career services
I received adequate support and guidance from my UAS regarding practical training.	Scale 1-7	Practical training
I received adequate support and guidance from the representatives from work regarding my practical training.	Scale 1-7	Practical training
The collaboration between the working life and my UAS worked well during my practical training.	Scale 1-7	Practical training
My practical training strengthened my competence.	Scale 1-7	Practical training
During my practical training, I was able to apply what I had learned at my UAS in practice.	Scale 1-7	Practical training
I believe that my practical training will help me find employment that is meaningful from the point of view of my studies.	Scale 1-7	Practical training
I received adequate support and guidance from my UAS regarding my thesis.	Scale 1-7	Thesis
I received adequate support and guidance from the representatives from work regarding my thesis.	Scale 1-7	Thesis
The collaboration between the working life and my UAS regarding my thesis worked well.	Scale 1-7	Thesis

Peer evaluation I received from other students helped me with my thesis.	Scale 1-7	Thesis
The thesis strengthened my competence.	Scale 1-7	Thesis
My thesis gave me an opportunity to put into practice what I had learned in the UAS.	Scale 1-7	Thesis
My thesis prepared me for work requiring expertise.	Scale 1-7	Thesis
I believe that my thesis will help me find work related with my studies.	Scale 1-7	Thesis
Teaching, guidance	Scale 1-7 (satisfaction): 1 = very dissatisfied 4 = neutral 7 = very satisfied	General satisfaction
Internationality during the studies	Scale 1-7 (satisfaction)	General satisfaction
Work relevance in my studies	Scale 1-7 (satisfaction)	General satisfaction
Career support	Scale 1-7 (satisfaction)	General satisfaction
Practical training periods	Scale 1-7 (satisfaction)	General satisfaction
Thesis process	Scale 1-7 (satisfaction)	General satisfaction
My progression in competences	Scale 1-7 (satisfaction)	General satisfaction
My professional development	Scale 1-7 (satisfaction)	General satisfaction
My education as a whole	Scale 1-7 (satisfaction)	General satisfaction

Appendix 2. Two analysis dashboards for detailed analysis (in Finnish)
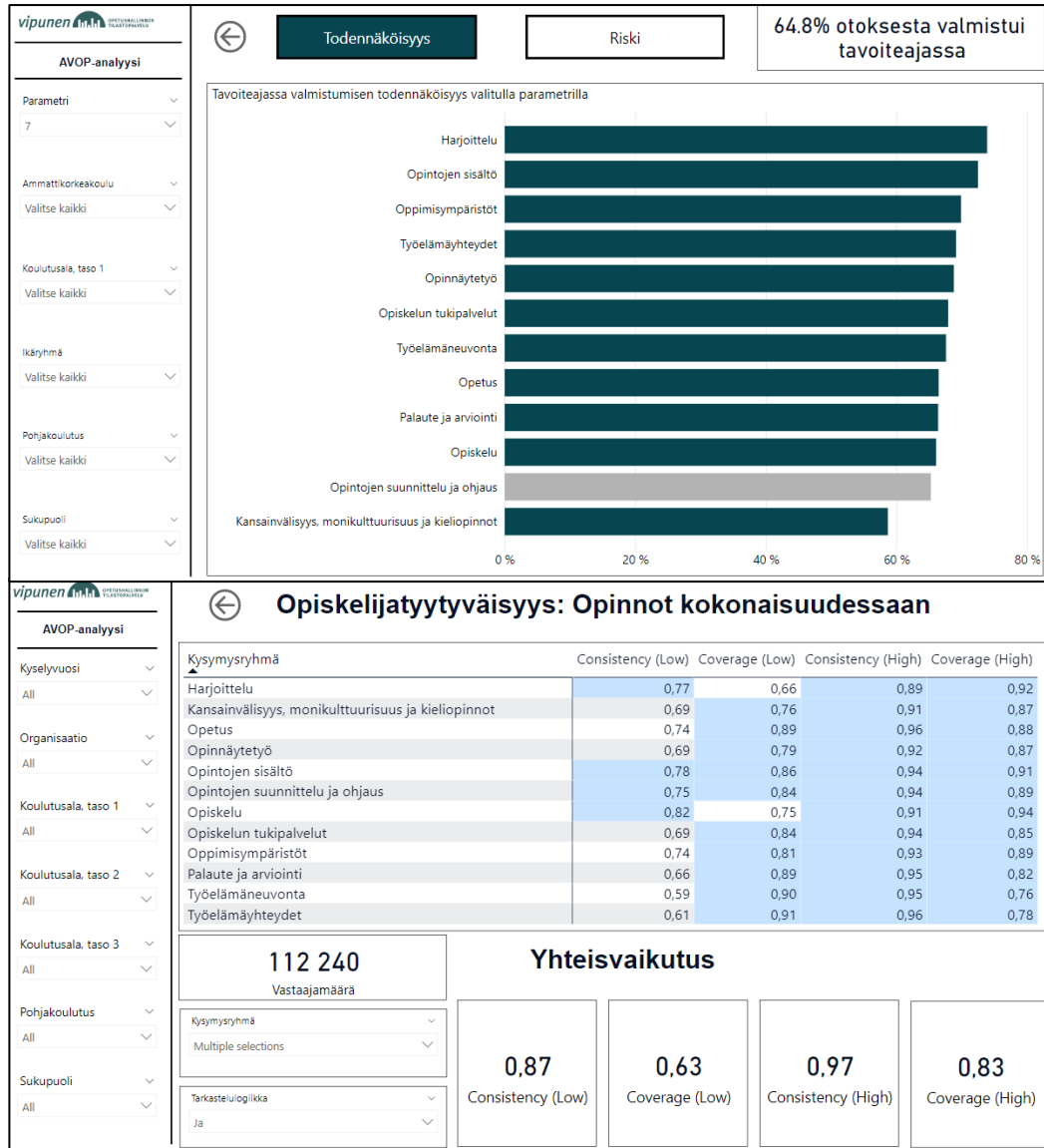
Appendix 3. Consistency and coverage values regarding satisfaction with teaching and guidance

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
It was clear what was expected of me in my studies.	0.67	0.79	0.45	0.88
The content of my studies corresponded to the content given in the curriculum.	0.70	0.79	0.45	0.88
Required course assignments and prerequisites for study units were clearly brought to everyone's attention.	0.68	0.78	0.41	0.90
My prior learning and know-how (RPL/AHOT) was well acknowledged in my studies.	0.53	0.78	0.45	0.83
Course scheduling was workable (timing, sufficient course supply).	0.57	0.81	0.56	0.81
In general, my studies did not include unnecessary study units, futile overlap or repetition.	0.47	0.84	0.68	0.69
My studies complimented each other and worked well together as a whole.	0.72	0.80	0.47	0.88
My individual study plan guided and promoted my learning.	0.54	0.81	0.57	0.79
I was able to share the workload evenly throughout the degree if I wanted to.	0.54	0.78	0.44	0.85
The course supply at my UAS enabled round-the-year studies.	0.57	0.77	0.38	0.88
I got enough support in planning my studies.	0.61	0.80	0.51	0.85
I received high quality study guidance.	0.65	0.81	0.52	0.85
The teachers were experts in their field.	0.79	0.79	0.45	0.89
The substance of my studies was well outlined and systematically presented.	0.73	0.81	0.51	0.87
The substance of my studies was clearly and understandably presented.	0.74	0.80	0.49	0.88
Studying was motivating and inspiring.	0.69	0.82	0.56	0.84
The educational and working methods used were versatile and	0.67	0.81	0.55	0.84

well-suited for each study context.				
The educational and working methods used took into account the differences in students' individual learning needs.	0.52	0.85	0.70	0.72
The study materials used were comprehensive, clear and concise.	0.62	0.83	0.61	0.80
The study materials were well available.	0.61	0.80	0.51	0.85

Appendix 4. Consistency and coverage values regarding satisfaction with work relevance in studies

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
The content of my studies met the requirements of the working life.	0.71	0.86	0.67	0.87
The methods and tools used in my studies coincided with those used in the working life.	0.70	0.84	0.64	0.88
The working life was made good use of as a versatile learning environment in my studies.	0.72	0.87	0.71	0.88
The staff at my UAS has adequately supported me in networking with the working life.	0.60	0.88	0.77	0.77
I am satisfied with the professional connections I have made during my studies.	0.64	0.83	0.62	0.84
The expertise of the working life was successfully utilised in the operations of my UAS.	0.68	0.87	0.73	0.85
The expertise of alumni was successfully utilised in my studies.	0.50	0.90	0.85	0.62
I was offered enough possibilities to participate in studies that included cooperation with working life.	0.62	0.90	0.80	0.78
In my opinion, the staff at my UAS is well acquainted with contemporary working life.	0.71	0.84	0.64	0.88
I have received adequate support in career planning in my studies.	0.56	0.90	0.82	0.71
I know well where and how to apply for jobs suitable for me and how to find employment.	0.65	0.79	0.49	0.88
During my studies, I have received sufficient knowledge regarding the practises of the working life (labour legislation, contract of employment, pay).	0.57	0.85	0.69	0.76
During my studies, I have been sufficiently instructed on how to effectively apply for work (job application, CV, job interviews).	0.56	0.84	0.67	0.76
During my studies, I have received sufficient guidance, counselling and other information regarding entrepreneurship.	0.50	0.87	0.78	0.64

Appendix 5. Consistency and coverage values regarding satisfaction with career support

Factor	Consistency (Low-Low)	Consistency (High-High)	Coverage (Low-Low)	Coverage (High-High)
The staff at my UAS has adequately supported me in networking with the working life.	0.76	0.81	0.73	0.83
I am satisfied with the professional connections I have made during my studies.	0.79	0.75	0.58	0.89
The expertise of the working life was successfully utilised in the operations of my UAS.	0.80	0.78	0.64	0.89
The expertise of alumni was successfully utilised in my studies.	0.64	0.84	0.81	0.68
I was offered enough possibilities to participate in studies that included cooperation with working life.	0.74	0.80	0.71	0.83
In my opinion, the staff at my UAS is well acquainted with contemporary working life.	0.79	0.73	0.54	0.90
I have received adequate support in career planning in my studies.	0.73	0.85	0.80	0.79
I know well where and how to apply for jobs suitable for me and how to find employment.	0.81	0.71	0.45	0.92
During my studies, I have received sufficient knowledge regarding the practises of the working life (labour legislation, contract of employment, pay).	0.72	0.78	0.66	0.82
During my studies, I have been sufficiently instructed on how to effectively apply for work (job application, CV, job interviews).	0.72	0.77	0.65	0.82
During my studies, I have received sufficient guidance, counselling and other information regarding entrepreneurship.	0.64	0.81	0.76	0.70