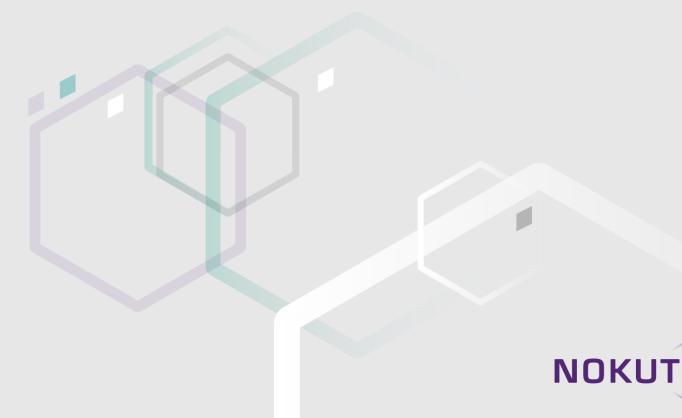# Studiebarometeret 2014:

What explains students' overall satisfaction? A review of the main findings of the 2014 Norwegian national student survey.

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Summary

In general, Norwegian students are very satisfied with their study program. Their overall satisfaction score is 4.1 on a scale from 1 to 5. In total, 76 percent of the students are either satisfied or very satisfied with their study program in general. We find some, but no large differences in the overall satisfaction score between different groups of students. Multilevel regression analysis reveals that men are more satisfied than women; bachelor students are more satisfied than master students; and part-time students are more satisfied than full time students. There are no differences in satisfaction between students from new universities, compared to students from specialized universities or university colleges. However, students from new universities are less satisfied than students from traditional universities. In addition, institution size has a negative impact on student satisfaction. The larger the institution, the less satisfied students are with the overall quality of their study programme.

In the national student survey, we ask students to assess the quality of several aspects we believe is important for the overall quality of the study programs. We examine students' satisfaction on single items in eight different indexes: 1) teaching and counselling, 2) learning environment, 3) influence and participation, 4) academic stimulation and coherence, 5) working life relevance, 6) student assessment, 7) students' learning goals and 8) vocational practice training. We are interested in knowing which of these different quality aspects are most influential on the students' overall satisfaction; in other words, what determines their overall satisfaction?

Of the different quality indexes, students are most satisfied with the (supposed) working life relevance of their study programme; 88 percent of the students are satisfied with the working life relevance of their program. Another 82 percent are satisfied with the academic stimulation and coherence of their program. Our multilevel regression models show that academic stimulation and coherence is the most influential factor for students' overall satisfaction. If students are one point (on a scale from 1 to 5) more satisfied with the academic coherence and stimulation of their program, their overall satisfaction increases with 10 percent. The second most influential factor on student overall satisfaction is satisfaction with teaching and counselling: one point higher score on satisfaction with teaching and counselling increases the overall satisfaction with 6 percent. When we examine single questions rather than indexes, we see that the degree to which programs and teachers stimulate students academically are the two most important factors influencing students' overall satisfaction with 7 and 3 percent, respectively. Students are least satisfied with the feedback and individual counselling they receive in their study programs. These two single items have surprisingly no influence on students' overall satisfaction score.

Next to some already mentioned individual background variables, student motivation also influence students' overall satisfaction. One point higher on the motivation scale of 1 to 5, increases students' overall satisfaction with 2.7 percent, when we control for the other indexes.

Time spent on studying has a very small negative effect on the overall satisfaction of students. When we control for students' motivation and the other indexes, we see that a one-hour increase in the time spent on studying per week (especially self-study) decreases students' overall satisfaction with 0.1 percent.

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1 Introduction

The Norwegian Agency for Quality Assurance in Education (NOKUT) conducts an annual student survey about the perceived quality of education in Norwegian bachelor and master programs. The Ministry of Education commissions the survey, called 'Studiebarometeret'. The survey has taken place every October since 2013. All second year bachelor and master students, and fifth year students in integrated master and professional degree study programs are given the opportunity to participate in the survey.

The questionnaire comprises 98 questions or statements, covering a range of topics measuring student satisfaction. Examples of these topics are: teaching and academic counselling, learning environment, assessment, and student influence and participation. The question: "*I am, all things considered, satisfied with the program I am currently attending*" is included to monitor the overall satisfaction of the quality of the students' study program. The questionnaire also includes questions about their rationale for choosing their specific program, their academic goals, motivation and study effort.

NOKUT publishes the results in February the following year on the web portal studiebarometeret.no. The portal contains time series (results from both 2013 and 2014 survey) and detailed information such as averages, standard deviations and response distributions organised per study program. The possibility exists to compare study programs. NOKUT uses the data to perform analyses and publishes reports on different topics. Research communities can access the survey data by contacting the Norwegian Social Science Data Services.

2 Participants in the survey

NOKUT invites all institutions offering higher education in Norway to participate in the survey. In 2014, Studiebarometeret covered 58 institutions, including all large and medium sized universities and university colleges. Students from 1738 study programs, divided into 955 bachelor programs and 783 master and professional degree programs. Altogether, just over 58 000 students received the survey in 2014. NOKUT receives background information – including e-mail address and phone number - on each recipient from the higher education institutions (HEI's). We ask students to allow us to match individual background data with their survey responses. Seventy-nine (79) percent of the respondents approved.

In 2014, the response rate was 42 percent (N=24 666), but differs considerably among institutions and programs. The first table shows descriptive statistics for a number of different characteristics. Only students who approved the use of background data are included.

The majority of the respondents are female, 62 percent. The median age of the respondents is 23; 62 percent of the students is between 17 and 24 years old, 30 percent is between 25 and 34 years old and 9 percent is older than 35.

Table 1 Background variables

	%	N	Median	Min-max	RESPONS %
STUDENTS' GENDER					
women	62	12 198			42
men	38	7 354			42
	100	19 552			
STUDENTS' AGE					
age			23	18-75	
17 – 24	62	12 075			42
25 – 34	30	5 771			42
> 35	9	1 701			39
	100	19 547			
STUDENTS' STUDY PROGRESSION					
mean ECTS over three semesters			30	0-100	
0	2	390			
1 - 19	18	3473			
20 – 29	18	3 421			
30 – 39	60	11 461			
40 - 100	2	393			
	100	19 138			
FIELD OF STUDY					
natural and technical sciences	24	5 852			44
other	20	4 849			40
social studies	18	4 345			43
humanities and social science	17	4 321			38
education	12	2 886			48
art and architecture	4	873			42
law	4	863			35
medical and life science	3	677			38
	100	24 666			
BACHELOR-MASTER					
bachelor	65	16 009			43
master	27	6 779			41
integrated master/professional study	8	1 878			41
	100	24 666			
TYPE OF PROGRAM					
fulltime	95	23 378			42
part time	5	1 288			35
	100	24 666			
PROGRAM SIZE					
number of recipients Studiebarometeret			54	1-912	
1 – 19	14	3 463			43
20 – 49	33	8 145			43
50 – 99	23	5 687			42
100 – 499	27	6 561			42
> 500	3	810			31
	100	24 666			
TYPE OF UNIVERSITY					
university college	48	11 895			48
academic university college	9	2 309			40
new university	9	2 146			33
other university	34	8 316			38
	100	24 666			
SIZE OF UNIVERSITY					
< 350 recipients	6	1 448			47
< 950 recipients	19	4 735			47
< 2 000 recipients	25	6 040			48
> 2 000 recipients	50	12 443			38
	100	24 666			

We measure the students' study progression as the average number of completed ECTS credits in the last three semesters. A regular academic semester in Norway is 30 ECTS credits. The average number of ECTS credits for our respondents is 26.5 while the median is 30 ECTS credits. This means that the majority of the students were fulltime students (credit wise) during the last three semesters.

We discern eight fields of study, which are based on a general or commonly used grouping of study programs (a.o. Wiers-Jenssen et al., 2002). About a quarter of all respondents are in a natural and technical sciences program, which makes this the largest field of study in this dataset. Medical and life sciences are the smallest field of study and comprises three percent of the students. The fields of study vary in response rates: almost half of the education students (48 percent) participated in the survey, while 35 percent of the law students participated.

Table 1 further shows that 65 percent of the respondents are bachelor students, while 35 percent are master or professional degree students. Most students (95 percent) attend full-time programs.

We discern four types of higher education institutions:

- university colleges,
- specialized universities,
- three new[1] universities (Stavanger, Agder & Nordland),
- and the five other universities (Oslo, Bergen, Tromsø, NTNU, NMBU).

Although NMBU was recently classified as a university, we decided to categorize NMBU as an 'other university'. In terms of its academic history and profile is NMBU more comparable to the traditional universities, than it is to the new universities. It has moreover, on average, the highest overall satisfaction score of the eight universities[2].

The higher education institutions vary in type and size, although the non-specialized universities never have less than 1000 recipients. We use the number of recipients of the Studiebarometer questionnaire to measure institution size. Six percent of all recipients attend a small institution (up to 350 recipients). However, the small institutions represent 48 percent of all institutions in Norway. Nineteen (19) percent attend a medium institution (up to 950 recipients); 25 percent a large institution (up to 2000 recipients); and half of the respondents attend a very large institution (more than 2000 recipients). In this sample, the very large institutions represent 13 percent of all institutions in Norway.

Almost half of the respondents attend a program at one of the university colleges (48 percent); 9 percent attend specialized universities; 9 percent attend new universities, and 34 percent attend one of the other universities.

More information about the representativeness of the data is available in this report (in Norwegian).

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[1] These universities used to be classified as university colleges, but have recently they been re-classified as universities (in 2005 (Stavanger), 2007 (Agder) and 2010 (Nordland)).

[2] If we categorize NMBU as a new university, it diminishes the gap in overall satisfaction between the new and the other universities, since NMBU-students score highest of all universities.

3   The questionnaire

The questionnaire contains series of questions about students' perceptions of quality of various aspects of the study programs. The questionnaire aims to capture students' views at the program level, not at the course- or institutional level. All students receive identical questionnaires, regardless of their type or field of study. It takes students on average about 11 minutes to complete the questionnaire. Students can choose whether they will answer the form in Bokmål, Nynorsk or English[3].

The questionnaire consists of 19 sections (batteries) of questions, in addition to open comment fields and a question of consent to link background data. All answer categories are 5-item Likert scales, with the value 1 representing 'not satisfied' and the value 5 representing 'very satisfied'. In addition, respondents can choose to answer 'don't know' or 'not relevant'.

NOKUT conducts the survey electronically. We contact students via their private e-mail, institutional email (at the institutions where this was relevant) and SMS. Students can complete the questionnaire on computer, tablet or smartphone. Students who do not answer the questionnaire after the first email receive a reminder email/SMS. Students were contacted maximum five times.

More information about the data gathering is available on NOKUT's website in this report (in Norwegian).

4   Students' satisfaction

Norwegian students are on average very satisfied with their study program. The Studiebarometer questionnaire measured students' satisfaction in eight different aspects, in addition to a question about the perceived overall satisfaction. We measure each aspect with a so-called 'index', which is composed of three to ten single items (questions). The eight indexes are:

- working life relevance
- academic stimulation and coherence
- student assessment
- learning environment
- learning outcomes
- vocational practice training[4]
- teaching and academic counselling
- student influence and participation

Students' overall satisfaction with their study program is not only determined by the usual suspects such as the academic and pedagogical quality of the teaching staff, but also by other academic, social and infrastructural factors. The different aspects represent a broader view of students' learning experience (Wiers-Jenssen et al., 2002). Note that student satisfaction does not measure student achievement, which is often regarded as an important indicator of quality. Student satisfaction might even have a downward curvilinear effect on student achievement (meaning that student achievement

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[3] Link to the questionnaire:
http://www.nokut.no/Documents/Studiebarometeret/Spørreskjema/2014_sporreskjema_Studiebarometeret_EN.pdf
[4] This index is only available for those students who had had practice training.

becomes lower after reaching a certain level of student satisfaction). The latter is however not the topic of this report.

Of all indexes, students are on average most satisfied with the working life relevance of their study programs: eighty-eight percent of the students are (very) satisfied with the working life relevance of their program, 2 percent are not satisfied, and the remaining 10 percent are ambiguous or indifferent on this topic. Students are also satisfied with the academic stimulation and coherence of their program (82 percent satisfied), learning environment (71 percent satisfied), student assessment (70 percent satisfied), and learning outcomes (66 percent satisfied). There is somewhat more variation in students' satisfaction with vocational practice training (57 percent satisfied) – among students who have had vocational practice training -, teaching and academic counselling (43 percent satisfied) and student influence and participation (42 percent satisfied).

Overall, 76 percent of the students are satisfied with the program they are currently attending; 8 percent are not satisfied, and 16 percent are ambiguous or indifferent. For students who attend the study program of their first choice, the percentage of students who are satisfied is even larger (85%). This is true for 87 percent of the students. Five percent of the students do not attend the study program of their first choice. Of these students is only 25 percent overall satisfied with their study program.

Table 2. Percentages overall satisfaction and satisfaction with the different indexes*

	satisfied	not satisfied	ambiguity/indifference	N	Cronbach's alpha
overall satisfaction	76	8	16	22 927	n.a.
working life relevance	88	2	10	23 484	0.83
academic stimulation and coherence	82	3	15	23 704	0.73
student assessment	70	4	26	23 348	0.81
learning environment	71	4	25	23 935	0.74
learning outcomes	66	3	31	23 091	0.85
vocational practice training	57	10	33	5 545	0.86
teaching and academic counselling	43	15	42	24 181	0.83
student influence and participation	42	20	38	22 953	0.77

* Satisfaction is asked for on 5-point Likert scale; % satisfaction is a sum of the percentages satisfied (4) and very satisfied (5), % not satisfied is a sum of the percentages not satisfied (1) and somewhat satisfied (2), ambiguity/indifference is the % of in between category (3).

The indexes are all composed of at least three and at most ten single items. The reliability of all indexes are satisfactory, with Cronbach's alpha[5] scores varying from .73 to .86. The overall question on perceived quality is a single question (no index): "To what extent do you agree that [you are], all things considered, satisfied with the programme [you are] currently attending?" In 2014, the average score on this question was 4.1 on a scale from 1 to 5[6]. There is nevertheless considerable variation among students (standard deviation is 0.99). Student satisfaction differs among different programs of study, higher education institutions, and of course among individual students. We consider these differences when analysing which aspects influence students' satisfaction the most.

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[5] Cronbach's alpha is an estimation of the reliability among several items – to what extent are these items internally consistent? – based on correlations. The maximum value is 1.00, a Cronbach's alpha value lower than .60 is considered unacceptable.

[6] No difference with 2013, the first year of Studiebarometeret.

5 Students' perception on quality: what matters?

In this section we examine the factors that affect the students' overall satisfaction score the most. We explore both indexes and the single items of each index (see appendix table 1 for an overview of the means and standard deviations of all single items). In addition to the indexes and the single items, we control for students' background characteristics. We collect our data from students within study programs at different institutions. Because of this hierarchical nested structure, we do not have completely independent cases at the individual level. When performing regression analyses, it is necessary to take the clustering of individuals into account. Ordinary least squares regression analysis[7] (OLS) assumes that individual cases are completely independent from each other. If this is not the case (as in our data), you underestimate the standard errors, which can lead us to conclude that a variable is statistically significant, when should not be. To solve this potential problem we perform multilevel regression analysis, which takes into account the nested structure of the data.

We discerned background characteristics at three 'levels' of analysis. Some characteristics represent the level of institutions: type and size of institutions. Other characteristics represent the program level: bachelor-master, fulltime-part-time, program size and field of study. The third category of background characteristics represent the individual level: gender, age, and study progression.

Multilevel modelling starts with a so-called zero-model, without any explanatory variables. The basic model shows the unexplained variance at the different levels of analysis. In our data, we find almost all of the unexplained variance (87 percent) at the individual level, 9 percent at the study program level and 4 percent at the institutional level. That means that the explanations for the differences in student satisfaction must be sought at the individual level characteristics mostly, and only to a smaller extent in program and institutional characteristics.

In the first multilevel model (table 3 model 1), we add seven of the eight indexes[8]. In order to facilitate the interpretation of the effect sizes, we standardized the dependent variable (overall satisfaction) to a scale from 1 to 100 (percentile scores). The effect sizes now show how many points on a scale from 1 to 100 the overall satisfaction increases or decreases under influence of the specific variable, controlled for all other variables in the model.

The results show that all indexes have a statistically significant effect on the overall satisfaction score. We found the same results in 2013 (Lid, Bakken, & Kantardjiev, 2014). The index 'academic stimulation and coherence' has the highest effect on overall satisfaction. If students score one point (on a scale from 1 to 5) higher on the index 'academic stimulation and coherence', the overall satisfaction increases with 10.5 percent. When we examine the individual items of the index, we find that the degree to which a study program is stimulating has the largest effect (6.7 percent) on overall satisfaction (see table 2 in the appendix).

The index 'teaching and academic counselling' has the second largest influence of all indexes on overall satisfaction, but the effect is considerably smaller. Students' overall satisfaction increases with 6.5 percent, if students score one point higher on satisfaction with teaching and academic counselling.

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[7] Regression analysis is a statistical method to estimate the influence of several explaining or independent variables at one to be explained or dependent variable. There are several ways to perform regression analysis –depended on the type of data -, the Ordinary Least Square (OLS) method is one of them.

[8] We tested the index vocational practice training in a separate model, due to a lower N. This model is found in appendix tables 3 and 4.

Here too, stimulation is the most important when we examine the different items that make up the index. If students increase the score on the question 'Teachers' ability to make their teaching stimulating' with one point their overall satisfaction increases with 3.3 percent. It is interesting to note that the two items the students are the least satisfied with (of all items in the survey) – feedback and individual counselling – have no statistically significant effect on students' overall satisfaction (appendix table 2)[9].

For the other indexes, the effect sizes are smaller. For 'learning outcomes' the effect size is 5.1 percent—that is, a one point increase on learning outcomes increases overall satisfaction with 5.1 percent. For 'working life relevance' the effect size is 4.4 percent. For the individual items that make up these two indexes are the effect sizes quite small, and none of the individual items have an effect size over 1.8 percent.

The three last indexes all have effect sizes under 4 percent. For 'learning environment', the effect size is 3.5 percent, and the effect size for the 'student participation and influence' is 2.8 percent. The 'assessment index' has a small negative effect (0.7 percent), meaning that if students are one point more satisfied with assessment methods they are 0.7 percent less satisfied with the overall quality of the program.

Students' motivation might help explain the negative effect of the assessment index. It is possible that highly motivated students have high demands on themselves and are therefore more satisfied with demanding assessment methods. Highly motivated students are moreover less easy to satisfy, because they demand much from others and from their program of study. We examine student motivation further in the next section.

The unexplained variance changes at all three levels in the first model compared to the zero-model. The indexes explain almost half of the variance at the individual level, almost all variance at the institutional level and a large part of the variance at the program level. This means that the students' satisfaction score on the different indexes largely explain the difference in overall satisfaction among students at different institutions—and to a lesser extent among students at different programs. However, the indexes do not explain the entire difference in the overall satisfaction score among individual students. Different background variables explains some of the difference as well.

Other student, program, or institution characteristics can influence the overall satisfaction score and, at the same time, the satisfaction scores of the different indexes. We therefore control for different background variables (model 2 in table 3), such as gender, age, study progression, bachelor-master, full time study program, program size, field of study, type and size of institution. In model 3 of table 3, we show the effects of background variables on overall satisfaction again, but this time we control for all index variables. This means that in model 3, we combine all variables from model 1 and model 2. Controlling for the background variables do not influence the effects of the different indexes in any significant way. However, when we include all variables in model 3, we see that some of the effects of the background variables changes when we control for the different indexes. Since there are no changes to the effects of the indexes, we only discuss the results of the background variables below.

When we control for all background variables and the indexes we see that men somewhat more satisfied than women are. The effect is small (1.1 percent), but statistically significant. There is no

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[9] See Hamberg, Damen & Bakken (2015) for a detailed examination of students' satisfaction with feedback and counselling.

statistical significant effect of age on students' overall satisfaction. Students' progression (measured as the average number of ECTS credits over the three last semesters) influences the overall satisfaction with .08: this means that increasing study progression with 10 ECTS credits, increases the overall satisfaction with almost one percent.

Both 2nd year and 5th year master students are less satisfied than 2nd year bachelor students. The effects are relatively small, 2 percent and 2.7 percent respectively, but statistically significant.

Education students are less satisfied (4.5 percent) than students in humanities and social sciences (the reference group) are. For the other fields of study there are no statistically significant effects.

Students from traditional universities[10] are 3.1 percent more satisfied compared to students from a recently established – a so called 'new' -university. There are no significant difference between students at new universities and students from university colleges or specialized universities. Students at the largest institutions (2000 recipients and more) are 2.1 percent less satisfied compared to students from the smallest institutions.

Adding background variables at the different levels means that the unexplained variance at the different levels decreases. There is no unexplained variance left at the institutional level, once we controlled for type and size of institution. The background variables together with the indexes explain all variation there is at the institutional level. The unexplained variance at the program and individual level decreases a small amount. This means that other characteristics than we measure are responsible for the remaining variance at the individual and program level.

The appendix shows the mean values and standard deviations of the single items within the different indexes, as well as a multilevel regression analysis of the effects of all single items on the overall satisfaction, controlled for the background variables.

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[10] including NMBU

Table 3 Multilevel regression analysis: dependent variable overall satisfaction (scale 1-100)

	Model 0		Model 1		Model 2		Model 3	
	B	sign	B	sign	B	sign	B	sign
INDEXES								
Teaching and counselling			**6.49**	***			**6.66**	***
Learning environment			**3.52**	***			**3.67**	***
Influence and participation			**2.75**	***			**2.69**	***
Academic stimulation and coherence			**10.49**	***			**10.46**	***
Working life relevance			**4.35**	***			**4.30**	***
Student assessment			**-0.65**	***			**-0.48**	***
Learning goals			**5.14**	***			**5.47**	***
INDIVIDUAL BACKGROUND								
women (ref)					0		0	
men					-0.23	ns	**1.05**	***
age					**0.18**	***	-0.02	ns
study progression					**0.11**	***	**0.08**	***
PROGRAM BACKGROUND								
bachelor (ref)					0		0	
master 2nd year					**1.62**	***	**-1.96**	***
master/professional study 5th year					-2.14	ns	**-2.68**	***
part time (ref)					0		0	
full time					**-6.18**	***	**-2.36**	***
program size					0.00	ns	**0.02**	***
FIELD OF STUDY								
education					**-5.25**	***	**-4.46**	***
medical and life science					**5.89**	***	1.16	ns
social studies					1.79	ns	-1.07	ns
humanities and social science (ref)					0		0	
other					0.29	ns	0.20	ns
art and architecture					3.98	ns	-1.13	ns
natural and technical sciences					0.54	ns	0.22	ns
law					3.45	ns	-2.52	ns
INSTITUTIONAL BACKGROUND								
new university (ref)					0		0	
university college					2.27	ns	-0.27	ns
specialized university					**7.26**	***	0.95	ns
other university					**6.35**	***	**3.07**	***
< 350 (ref)					0		0	
< 950					-2.60	ns	-0.39	ns
< 2000					**-6.46**	***	-1.80	ns
> 2000					**-6.42**	***	**-2.05**	***
intercept	51.61	***	**-71.96**	***	49.65	***	**-72.57**	***
Institutional level	**28.99**	***	**2.88**	***	**11.17**	***	0.37	ns
Program level	**69.84**	***	**13.62**	***	**62.76**	***	**11.49**	***
Individual level	**651.45**	***	**384.32**	***	**635.39**	***	**376.09**	***
N institutions	58		58		58		58	
N programs	1738		1738		1738		1738	
N students	22927		21926		19058		18254	
-2* loglikelihood	214943.1		193308.2		178173.8		160473.9	

Bold coefficients, marked with *** are statistically significant at the 95% level, ns means non-significant.

6 Motivation and choice of study programme

We asked several questions about the students' personal goals and motivation. It is likely that motivation and expectations influence students' overall satisfaction. It is for example possible, that highly motivated students enjoy studying more than less motivated students. If this is the case, higher motivation can lead to higher satisfaction scores. On the other hand, highly motivated students might also have high expectations. High expectations are more difficult to satisfy, which could lead to lower satisfaction scores. Unfortunately, because our data is cross-sectional—that is, we measure both concepts at the same time—we cannot say anything about the causal relationship between these concepts. In other words, it is possible that students become less motivated when they are less satisfied with their study programmes, or vice versa. Without panel data –in which you follow students over time- it is difficult to say what comes first: 'the chicken or the egg?' Despite this shortcoming, we can study how motivated students are, why they choose the program they do, and how these concepts relate to each other and to students' overall satisfaction.

Norwegian students are on average motivated to study. The overall mean on this index is 3.7 on a scale from 1 to 5. The scale consists of seven items and has satisfactory reliability (Cronbach's alpha is .77). The last item had a somewhat deviant scale and has more missing values compared to the other items. This item asks students about the goal they have concerning their grades. On average students aim to receive grades that are above average. Students are also motivated for working on [their] studies (mean 4.1), and they think of themselves as hard-working students (mean 3.7). Students are somewhat less satisfied regarding the contribution the study program has on their motivation: the average score on the item 'the study program stimulates my motivation for working with my studies' is 3.5. However, students are also self-critical: they score an average of 3.5 on the extent they '[..] participate in the organised learning activities that are offered', and only 3.3 on the degree to which they show up well prepared for organised learning activities.

Table 4. Means, standard deviation and sample size of the items in the index personal aim and motivation.

	Mean (scale 1-5)	Std dev	N
To what extent do you agree that:			
I am motivated for working on my studies	4.1	0.94	22 984
The study program stimulates my motivation for working with my studies	3.5	1.12	22 823
I participate in the organised learning activities that are offered	3.5	1.21	21 883
I show up well prepared for organised learning activities	3.3	1.00	22 882
I think of myself as a hard-working student	3.7	1.00	22 873
I have to work hard to achieve the grades I am aiming at	4.0	1.01	22 814
What goals do you have concerning your grades (1=merely passing, 2=below average, 3=average, 4=above average, 5=well above average)	4.1	0.84	20 070
INDEX motivation	3.7	0.67	23 066

We also examine student characteristics and motivation (table not reported, available on request). The results show that women are significantly more motivated than men are. Women score 6.7 percent higher on motivation than men. Second-year master students are more motivated than bachelor

students are (6.6 percent). Yet, we find no significant differences in motivation between fifth-year master students and bachelor students. Students from specialized universities are 6.4 percent more motivated compared to students from new universities. Older students are somewhat more motivated, although the effect is small (0.8 percent).

We asked students to consider different factors that affected their choice of study programme.[11]. In general, students choose their program mainly because of academic interest (mean value 4.4). The second and third most important factor was the expected job after studies (mean 3.9), and the institution's academic reputation (mean 3.8). The specific city or location (3.5) and the institution's social environment (3.4) score reasonably high too. Less important in the choice of a study program are the proximity of parental home (mean 2.9), that the program is provided at no or only few other places (2.8) and that the admission was easier compared to alternative programmes or institutions (mean 2.0).

Table 5. Means, standard deviation and sample size of the items on considerations in the choice for a study program.

	Mean (scale 1-5)	Std dev	N
How important for your choice of this programme was:			
This specific city / location	3.5	1.32	24 451
Proximity of parental home	2.9	1.53	24 455
The institution's academic reputation	3.8	1.07	24 451
The institution's social environment	3.4	1.21	24 379
This type of program is provided only few / no other places	2.8	1.42	24 438
Academic interest	4.4	0.77	24 454
Admission was easier than on alternative programmes / institutions	2.0	1.22	24 422
Expected job after studies	3.9	1.13	24 516
Expected earnings after studies	3.4	1.19	24 499

The items are all very different, and they do not form one concept or scale. We can however discern three main types of considerations: students who choose their program because of 1) academic reasons (academic reputation and academic interest); 2) social reasons (specific city and social environment); and 3) economic reasons (expected job and expected earnings). The three types of reasons correlate only minor with each other: the correlation between academic and social reasons is .28, between academic and economic reasons is .20 and between social and economic reasons is the correlation .16. A low correlation means that when students score high (or low) on one type of reason, this does not lead to a high (or low) score on another type of reason.

We are interested in how these considerations relate to students' motivation and to their overall satisfaction score. Multilevel analysis (table 6, model 1) shows that motivation and academic considerations in their choice of study contributes with respectively 12.5% and 6% to students' overall satisfaction; social reasons contribute to a lesser extent (1.3%). Economic reasons for their choice of study influence the overall satisfaction of students negatively (-0.5%). However, when we control for the indexes, the effect of motivation is reduced to less than 3%. This is because students' motivation and their satisfaction with the indexes on the different aspects are highly correlated. Unfortunately, we

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[11] Note that we did not ask for students' expectations regarding their study program while studying, which would influence their satisfaction perhaps more.

cannot say whether the relationship is causal since we do not have panel data. It might be that motivated students become very satisfied with the different aspects of their study program, but it might also be that students who are very satisfied with the different aspects on their study program become more motivated. In both cases, we see a positive relationship between the satisfaction indexes, students' motivation and overall satisfaction.

Table 6 Multilevel analysis dependent variable overall satisfaction (1-100).

	Model 0		Model 1		Model 2		Model 3	
	B	sign	B	sign				
MOTIVATION								
motivation index			**12.54**	***			**2.65**	***
CHOICE OF STUDY								
academic considerations			**5.96**	***			**1.37**	***
social considerations			**1.29**	***			0.13	ns
economic considerations			**-0.53**	***			-0.94	ns
INDEXES								
Teaching and counselling					**6.66**	***	**6.39**	***
Learning environment					**3.67**	***	**3.46**	***
Influence and participation					**2.69**	***	**2.68**	***
Academic stimulation and coherence					**10.46**	***	**9.82**	***
Working life relevance					**4.30**	***	**4.38**	***
Student assessment					**-0.48**	***	**-0.56**	***
Learning goals					**5.47**	***	**4.55**	***
INDIVIDUAL BG								
women (ref)			0		0		0	
men			**2.52**	***	**1.05**	***	**1.44**	***
age			-0.06	ns	-0.02	ns	-0.06	ns
study progression			-0.00	ns	**0.08**	***	**0.06**	***
PROGRAM BG								
bachelor (ref)			0		0		0	
master 2nd year			-0.70	ns	**-1.96**	***	**-2.07**	***
master/professional study 5th year			**-2.17**	***	**-2.68**	***	**-2.37**	***
part time (ref)			0		0		0	
full time			**-5.57**	***	**-2.36**	***	**-2.35**	***
program size			0.00	ns	**0.02**	***	**0.01**	***
FIELD OF STUDY								
education			**-3.58**	***	**-4.46**	***	**-3.97**	***
medical and life science			3.74	ns	1.16	ns	0.93	ns
social studies			0.89	ns	-1.07	ns	-1.00	ns
humanities&social science (ref)			0		0		0	
other			0.82	ns	0.20	ns	0.49	ns
art and architecture			-1.83	ns	-1.13	ns	**-2.31**	***
natural and technical sciences			0.29	ns	0.22	ns	0.56	ns
law			0.91	ns	-2.52	ns	-2.74	ns
INSTITUTIONAL BG								
new university (ref)			0		0		0	
university college			0.27	ns	-0.27	ns	-0.38	ns
specialized university			3.13	ns	0.95	ns	0.62	ns
other university			3.13	ns	**3.07**	***	**2.27**	***
< 350 (ref)			0		0		0	
< 950			-1.07	ns	-0.39	ns	-0.10	ns
< 2000			**-4.42**	***	-1.80	ns	-1.54	ns
> 2000			**-5.66**	***	**-2.05**	***	-1.86	ns
intercept	**51.61**	***	**-14.56**	***	**-72.57**	***	-75.98	***
Institutional level (N=58)	**28.99**	***	**3.13**	***	0.37	ns	0.04	ns
Program level (N=1738)	**69.84**	***	**46.16**	***	**11.49**	***	**11.58**	***
Individual level	**651.45**	***	**540.56**	***	**376.09**	***	**372.64**	***
N students	22927		18967		18254		18169	
-2* loglikelihood	214943.1		174134.7		160473.9		159556.7	

Bold coefficients, marked with *** are statistically significant at the 95% level, ns means non-significant.

7   Work load

We asked students to indicate how many hours per week they spend on average on different types of activities related to studying. We divided time use into hours per week on organized learning activities and hours per week on self-study activities. In our analysis, we add the hours spent on organized learning activities and self-study to generate a variable for the total number of hours spent on studying. For the entire sample, students report a total time spent of 34.1 hours per week: 16 hours organized activities and 18.1 hours self-study. Of course, these numbers are different for fulltime or part-time students: fulltime students report a total time spent of 34.7 hours per week, versus 22.3 hours per week reported by part-time students. Compared to part-time students, full time students spend almost 5 hours more per week in organized learning activities, and approximately 8 hours more on self-study. The gap is even larger when we examine the amount of hours fulltime and part-time students spend on paid work: 7 hours per week for fulltime students and 25 hours per week for part-time students.

Table 7. Mean hours per week on study activities and work

	Mean (hours per week)	Std dev	N	Mean (hours per week)	
Indicate how many hours per week, on average in your current study program (not including holidays), you spend on:				fulltime	part-time
Learning activities organised by the institution (including all teaching and counselling sessions, plus vocational practice training if relevant)	16.0	10.52	21 249	16.3	11.5
Individual work (including voluntary cooperation with other students)	18.1	11.78	21 372	18.4	10.8
Paid work	8.0	10.21	21 447	7.1	25.2
Unpaid work in connection with studies (e.g. work as student representative, in student clubs/organisations, in student media)	2.0	5.43	19 805	2.0	1.8
Other kinds of unpaid work (e.g. volunteering for NGO's, associations and other organisations)	1.4	3.89	18 937	1.4	1.5

We also examined student characteristics and time spent on studying. Controlling for all other background variables (table not reported, available on request), women spend 3 percent more time on their studies than men do, but this effect almost disappears (to 0.8 percent) once we control for motivation. Fifth-year master students spend 4 percent more time on academic activities compared to second-year bachelor students. When we control for motivation, there is no significant difference between second-year bachelor and master students. Full time students spend - as expected - much more time (23.5 percent) on their studies compared to part-time students. The analysis also shows, unsurprisingly, that highly motivated students spend 14 percent more time on their studies. We also find that students in different academic fields differ considerably in the amount of time spent on studying.

Finally, we examined the relationship between time spent on studying and students' overall satisfaction (table 8). The effect of workload on overall satisfaction is negative, but very small, when we control for students' motivation and the other indexes (model 1). Students' overall satisfaction decreases with less than one percent if students spend one hour more per week studying. Further

analyses show that the negative effect of work load on overall satisfaction is due to the negative effect of the non-organized learning activities (self-study), while the effect of organized learning activities on overall satisfaction is not significant (model 2).

The conclusion is that although students do differ in the amount of time spent on academic activities, this does not affect their overall satisfaction at all. We discuss time usage further in a forthcoming NOKUT report.

Table 8 Multilevel analysis dependent variable overall satisfaction (1-100).

	Model 0		Model 1		Model 2	
	B	sign	B	sign	B	sign
TIME USE						
total time use			**-0.03**	***		
organised learning activities					-0.02	ns
self-study					**-0.05**	***
MOTIVATION						
motivation index			**2.84**	***	**2.87**	***
CHOICE OF STUDY						
academic considerations			**1.44**	***	**1.46**	***
social considerations			0.10	ns	0.10	ns
economic considerations			**-0.97**	***	-0.96	ns
INDEXES						
teaching and counselling			**6.46**	***	**6.41**	***
learning environment			**3.47**	***	**3.38**	***
influence and participation			**2.64**	***	**2.65**	***
academic stimulation and coherence			**9.84**	***	**9.91**	***
working life relevance			**4.46**	***	**4.42**	***
student assessment			**-0.63**	***	**-0.66**	***
learning goals			**4.52**	***	**4.55**	***
INDIVIDUAL BACKGROUND						
women (ref)			0		0	
men			**1.45**	***	**1.41**	***
age			-0.05	ns	-0.06	ns
study progression			**0.06**	***	**0.06**	***
PROGRAM BACKGROUND						
bachelor (ref)			0		0	
master 2nd year			**-2.05**	***	**-2.04**	***
master/professional study 5th year			**-2.29**	***	**-2.23**	***
part time (ref)			0		0	
full time			**-1.94**	***	**-1.86**	***
program size			**0.01**	***	**0.01**	***
FIELD OF STUDY						
education			**-3.87**	***	**-3.96**	***
medical and life science			1.15	ns	1.03	ns
social studies			-0.69	ns	-0.78	ns
humanities and social science (ref)			0		0	
other			0.66	ns	0.65	ns
art and architecture			-2.08	ns	-2.36	ns
natural and technical sciences			0.86	ns	0.89	ns
law			-2.82	ns	-2.74	ns
INSTITUTIONAL BACKGROUND						
new university (ref)			0		0	
university college			-0.41	ns	-0.37	ns
specialized university			0.39	ns	0.51	ns
other university			**2.41**	***	**2.48**	***
< 350 (ref)			0		0	
< 950			-0.68	ns	-0.72	ns
< 2000			**-2.03**	***	**-2.12**	***
> 2000			**-2.45**	***	**-2.55**	***
intercept	**51.61**	***	**-76.19**	***	**-75.96**	***
Institutional level (N=58)	**28.99**	***	0.00	ns	0.00	ns
Program level (N=1738)	**69.84**	***	**11.10**	***	**10.97**	***
Individual level	**651.45**	***	**370.60**	***	**370.60**	***
N students		22 927		18 224		17 195
-2* loglikelihood		214 943.1		167 222.2		150 895.3

Bold coefficients, marked with *** are statistically significant at the 95% level, ns means non-significant.

References

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Appendixes

Appendix table 1. Means, standard deviation and sample size of the single items of the indexes

	Mean (scale 1-5)	Std dev	N
How satisfied are you with …			
The teachers' ability to make their teaching stimulating	3.4	0.98	24 076
The teachers' ability to facilitate your understanding of difficult subject matter	3.4	0.97	24 003
How well the teaching covers the curriculum	3.7	0.93	23 640
Feedback on your work given by the teachers (is the feedback constructive?)	3.3	1.11	23 151
Individual student counselling given by the teachers	2.9	1.21	23 262
How satisfied are you with …			
The social environment among students at the program.	3.9	1.04	23 226
The academic environment among students at the program.	3.8	0.94	23 317
Rooms for teaching and other study work.	3.5	1.14	23 719
Equipment and study tools.	3.6	1.02	22 940
Library and library services.	4.1	0.93	21 830
ICT tools and services (e.g. teaching platforms, software and PC availability)	3.7	1.03	22 680
How satisfied are you with …			
The students' opportunity to influence the study programs' content and design.	3.1	1.07	21 688
How students' viewpoints are taken into account and followed.	3.1	1.14	21 152
The local student democracy (e.g. student representatives and student organisation).	3.6	0.98	18 578
To what extent do you find that the program:			
Is stimulating.	4.0	0.92	23 625
Is academically challenging.	4.3	0.78	23 623
Consists of courses that are well connected and integrated.	4.0	0.95	23 561
To what extent do you find that the program:			
Is relevant to 'natural' occupational fields	4.4	0.83	23 172
Provides good career opportunities	4.2	0.95	22 816
Provides knowledge that is generally useful in occupational life	4.3	0.87	23 211
Provides skills that are generally useful in occupational life	4.2	0.92	23 174
To what extent do you find that examinations and other written assignments (so far) have:			
Concerned central parts of the curriculum	4.1	0.82	23 189
Required understanding and reasoning	4.2	0.78	23 104
Stimulated reflection and critical thinking	3.9	0.98	23 047
Required creative/fresh thinking on your part	3.4	1.11	22 978
Encouraged the use of knowledge from other courses to answer assignments	3.5	1.11	22 924
How satisfied are you with your own learning outcomes so far, concerning:			
Theoretical knowledge	3.8	0.85	22 868
Knowledge of scientific work methods and research	3.4	1.00	21 219
Experience with research and development work	3.1	1.07	19 925
Skills specific to discipline and working life	3.5	1.01	21 653
Critical thinking and reflection	3.8	0.91	22 620
Cooperative skills	3.9	0.92	22 589
Ability to work independently	4.1	0.84	22 892
Oral communication skills	3.6	1.02	22 357
Written communication skills	3.8	0.88	22 604
Innovative thinking	3.5	0.95	22 292

Appendix table 2. Multilevel regression analysis of dependent variable overall satisfaction (scale 1-100), controlled for background variables (not in the table)

	Model 0		Model 1	
	B	sign	B	sign
SINGLE ITEMS: SATISFACTION WITH				
TEACHING AND COUNSELLING				
Teachers' ability to make their teaching stimulating			**3.28**	***
Teachers' ability to facilitate understanding			0.78	ns
How well teaching covers the curriculum			**1.47**	***
Feedback on your work by teachers (is it constructive)			0.17	ns
Individual student counselling given by the teachers			0.27	ns
LEARNING ENVIRONMENT				
Social environment			**1.74**	***
Academic environment			**0.59**	***
Rooms for teaching and other study work			0.46	ns
Equipment and study tools			0.35	ns
Library and library services			-0.22	ns
ICT tools and services			**0.49**	***
INFLUENCE AND PARTICIPATION				
Students' opportunity to influence study programs' content/design			**0.63**	***
How students' viewpoints are taken into account			**2.80**	***
Local student democracy			**-0.66**	***
ACADEMIC STIMULATION AND COHERENCE				
The program is stimulating			**6.65**	***
The program is academically challenging			0.45	ns
The program consist of courses that are well connected and integrated			**2.33**	***
WORKING LIFE RELEVANCE				
The program is relevant to natural occupational fields			0.33	ns
The program provides good career opportunities			**1.62**	***
The program provides knowledge that is generally useful in occupational life			0.52	ns
The program provides skills that are generally useful in occupational life			**1.75**	***
STUDENT ASSESSMENT				
Exams have concerned central parts of the curriculum			**1.11**	***
Exams have required understanding and reasoning			-0.08	ns
Exams have stimulated reflection and critical thinking			-0.17	ns
Exams have required creative/fresh thinking on your part			-0.18	ns
Exams have encouraged the use of knowledge from other courses			0.10	ns
LEARNING GOALS				
Theoretical knowledge			**1.55**	***
Knowledge of scientific work methods and research			0.15	ns
Experience with research and development work			**0.72**	***
Skills specific to discipline (field of study) and working life			0.45	ns
Critical thinking and reflection			0.42	ns
Cooperative skills			0.02	ns
Ability to work independently			**0.59**	***
Oral communication skills			**0.56**	***
Written communication skills			**0.42**	***
Innovative thinking			-0.03	ns
intercept	**51.61**	***	**-66.65**	***
Institutional level (N=58)	**28.99**	***	0.33	ns
Program level (N=1738)	**69.84**	***	**6.62**	***
Individual level	**651.45**	***	**353.46**	***
N students	22 927		9 644	
-2* loglikelihood	214 943.1		84 120.9	

Bold coefficients, marked with ***, are statistically significant at the 95% level; ns means non-significant.

Appendix table 3. Means, standard deviation and sample size of the vocational practice index

	Mean (scale 1-5)	Std dev	N
To what extent do you find that the program:			
How the study program prepared you for practice training	3.3	1.12	5488
Communication between the practice site and your study program	3.1	1.17	5285
Feedback received during practice training	3.6	1.11	5300
The profession-specific challenges you met during practice training	3.9	1.03	5321
The relevance of the program's theory content for the conduct of practice training	3.5	1.05	5369
How experience from practice training is used as a basis for discussion/reflection in conventional teaching	3.6	1.04	5229
Practice training in general	3.9	1.00	5345

One index deals with questions on students' vocational practice training. Only students who have had vocational practice training according to their institutions received these questions in the survey. Thus, the sample size is only 5 545 students.

The index consists of seven single items[12]. Students are most satisfied with their practice training in general (mean 3.9) and with the profession-specific challenges [they] met during practice training (mean 3.8). They are least satisfied with the communication between the practice site and [their] study program (mean 3.1) and with [the way] the study program has prepared [them] for practice training (mean 3.3).

There is medium sized influence of the practice index on students' overall satisfaction. Students' overall satisfaction increases with almost 3% if their satisfaction with practice training is one point higher on the scale from 1 to 5 (model 1, table 4). Two out of the seven single items have a statistically significant effect on the overall satisfaction score (model 2). One point higher on the first item (how the study prepared you for practice training) and on the last item 'practice training in general' both increases students' overall satisfaction with 1.5%.

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[12] We checked whether the last statement should or should not be part of the index, but we found that the results did not change. Because all questions on vocational practice training were asked in the same set of questions; because the last statement has the highest factor loading in the confirmatory factor analysis (available upon request) and because the reliability of the scale is higher when the last statement is included, we decided to comprise the last statement within the scale.

Appendix table 4 Multilevel analysis dependent variable overall satisfaction (1-100).

	Model 0		Model 1		Model 2	
	B	sign	B	sign	B	sign
INDEXES						
Teaching and counselling			**6.87**	***	**6.88**	***
Learning environment			**2.18**	***	**1.99**	***
Influence and participation			**3.34**	***	**3.13**	***
Academic stimulation and coherence			**8.63**	***	**8.47**	***
Working life relevance			**4.69**	***	**4.56**	***
Student assessment			-0.21	ns	-0.09	ns
Learning goals			**4.99**	***	**4.78**	***
Vocational practice training:			**2.79**	***		
Preparation					**1.59**	***
Communication					0.01	ns
Feedback					-0.52	ns
Challenges					0.85	ns
Relevance					-0.84	ns
Discussion/reflection					0.56	ns
Practice training in general					**1.55**	***
INDIVIDUAL BACKGROUND						
women (ref)			0		0	
men			1.44	ns	**1.71**	***
Age			0.09	ns	0.11	ns
study progression			0.04	ns	0.05	ns
PROGRAM BACKGROUND						
bachelor (ref)			0		0	
master 2nd year			-0.94	ns	-0.34	ns
master/professional study 5th year			-2.92	ns	-2.25	ns
part time (ref)			0		0	
full time			-0.91	ns	0.92	ns
program size			0.00	ns	0.00	ns
FIELD OF STUDY						
Education			**-3.98**	***	**-4.46**	***
medical and life science			**4.67**	***	**5.66**	***
social studies			-1.88	ns	-2.13	ns
humanities and social science (ref)			0		0	
Other			-0.69	ns	-1.45	ns
art and architecture			**4.63**	***	5.72	ns
natural and technical sciences			6.88	ns	19.21	ns
Law			-		-	
INSTITUTIONAL BACKGROUND						
new university (ref)			0		0	
university college			1.19	ns	1.79	ns
specialized university			0.69	ns	0.02	ns
other university			0.67	ns	0.38	ns
< 350 (ref)			0		0	
< 950			-1.49	ns	-1.68	ns
< 2000			**-4.09**	***	**-4.60**	***
> 2000			-1.34	ns	-1.75	ns
intercept	**50.63**	***	**-75.13**	***	**-74.96**	***
Institutional level (N=30)	**20.14**	***	**0**		**0**	
Program level (N=279)	**89.39**	***	**5.07**	***	**7.37**	***
Individual level	**645.65**	***	**384.89**	***	**381.70**	***
N students	5 855		4 370		3 841	
-2* loglikelihood	54 841.5		38 464.3		3 3793.0	

Bold coefficients, marked with *** are statistically significant at the 95% level, ns means non-significant.