

Learning outcome in professional education: The influence of institutional and student characteristics

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Abstract. This study aims at analysing how students' learning outcome is affected by three sets of factors: students' background, the teaching environment and students' own effort and learning style. The analyses are based on a set of data collected among students in professional study programmes within Norwegian state Colleges: among them teaching, nursing and social work. Data was collected while students were in their first and in their final semester. Our main findings are that learning outcome is affected by students' background only to a limited degree. Neither parental education, nor previous school marks have any effect. Learning outcome vary between study programmes, and is affected by teaching quality and social climate. Students' own learning style is important, while study effort, measured in number of study hours per week, has no effect.

Keywords: Learning outcome, family background, school achievement, students' study behaviour, professional programmes

Introduction

There has been a strengthened focus on quality as well as quality assurance in higher education over the last years. Higher education institutions have also continuously been under pressure for accountability and productivity. Productivity may be defined in a number of ways. In Norwegian policy, the main focus is on time to degree, but a more fundamental approach is how to increase the amount that students learn without increasing costs (Kuh and Pace 1997). This article makes an attempt to measure learning outcome among students empirically, and to identify what are the main factors which are decisive for learning outcome. Is it possible to identify effects on the learning outcome from the learning context and students' own effort, or are the results mainly determined from the resources students bring with them? Our initial assumption is that students' learning outcome is affected by these three main set of factors: quality of delivery (the curriculum and the teaching and learning environment), students' own efforts and study strategy, and characteristics of the students enrolled (e.g. previous school achievement, family background, gender and motivation). Furthermore, we assume that these factors may be interrelated: students' study effort and learning style may be affected by the institution.

Furthermore, our focus is on a specific segment of higher education, the education for the semi-professions like nursing, basic school teaching etc. These professions play an important role in the society, and especially within what is in the Nordic countries termed the occupations of the Welfare State. The knowledge base of these professions is a balance between theoretical-analytical knowledge and practical skills, and for most of the professions also the ability to deal with people (pupils, patients of clients). The relevant knowledge base is furthermore created through a combination of initial education and work experience. Hence, our study also aims at understanding the role of education in the process of professional qualification formation.

The context

In Norway, professional education for the semi-professions is mainly the responsibility of the State Colleges, even if there are also a few private schools. With the exception of teaching, which is a four year programme, nearly all professional studies are of three years duration. In 1994 all 96 specialised public professional schools were merged into 26 regionalised State Colleges, also including the former Regional Colleges. The higher education sector outside the universities is large in Norway, comprising about 60 percent of all students. Historically, professional studies have been attractive among the applicants, and the competition to be admitted has been stronger than in most university programmes, even if the number of applicants relative to the capacity has dropped during the last five years.

In 2003, the far-reaching Quality Reform was implemented, introducing a new degree structure according to the Bologna declaration, and with a strengthened focus on quality in teaching and learning as well as evaluation. The reform introduces a better follow-up and feed-back to students, and end examinations is to some degree aimed to be replaced by portfolio evaluations. While the degree structure mainly affected the universities, the teaching and learning reform affected also professional education. The existing professional degrees after the reform have been included in the bachelor degree without any significant changes, but a number of new professional master programmes are about to be established.

But even if the new degree structure affects the State Colleges less dramatically than the universities, the Quality Reform's aims of improving teaching quality affect all types of institutions. These aspects are strengthened due to a new funding system where a proportion of the funding of the institution is based on the number of credits produced. Also the financial support of the students is changes in the same direction. Loans are transferred into grants as the students pass their examinations.

Both the general concern about the quality of professional education and the increased focus on quality in higher education following the Quality Reform makes it relevant to investigate the quality of the learning process in professional education. We therefore want to focus on how competencies have been formed in the interplay between students' background characteristics (family background, grades from secondary schools and motivations for the study), study effort and study behaviour, and characteristics of the teaching and learning environment of the respective study programmes. The empirical data for these analyses is a panel study among students starting their studies in 2000, and surveyed both in their first and their final semester. This panel will later be followed up two years after graduation.

Analytical perspectives

In this paper, we want to see what students have learnt during their professional education, and what factors which are decisive for students' learning. Our basic assumption is that learning outcome is related to three main sets of explanatory factors:

1. What students bring with them in terms of previous school achievement, family background, personality and motivation
2. The learning context, curriculum, teaching quality and learning environment
3. Students' own effort and learning style

We would naturally expect that learning outcome to be closely related to the individual aptitude of the student. Learning outcome in higher education is affected by what the student has learnt in previous schooling, measured by school marks from upper secondary education. Whether being a result of certain innate characteristics or effort in the school work, both are relevant factors to explain success in studies. We have no access to test data, but our data set contains school marks from upper secondary education. A close relationship between school marks and marks at university is found by both Eikeland (1987) and Berg (1995). We would therefore expect similar results in our sample.

Gender, family background and age are important explanatory factors in analyses of enrolment to different levels and types of education. Women were traditionally underrepresented in higher education, but are now in majority. There is, however, still a strong degree of gender segregation concerning field of study in both secondary and higher education (Støren & Arnesen 2003). Family background, specified either as socio- economic status or the educational level of the parents is strongly documented to have effects on enrolment to higher education (Boudon 1974), also in Norway (Aamodt 1982, Knudsen, Sørensen and Aamodt 1993, Hansen 1999). According to Shavit & Blossfeld (1993), inequalities in educational attainment still exist among most countries. This is generally the case also in Norway (Hansen 1999). Family background may explain preferences and choices made by youth from different social classes, but also whether students succeed in higher education. Students from high-income and highly educated families are supposed to bring

with them certain advantages in terms of academic traditions and “cultural capital” (Bourdieu & Passeron 1992), while “first generation academics” are considered to have drawback.

In both primary and secondary schools children with parents having higher education get better marks (Arnesen 2003, Vibe 1994, Grøgaard 1995). Eikeland (1987 and Berg (1995) also found a relationship between social background and marks in higher education, but the effect disappears when controlling for upper secondary school marks. Both these studies included only university students, but we would still expect to find that school marks and family background is affecting learning outcome among professional students. However, Kuh, Pace and Vesper (1997) found, consistent with Astin (1993) and Pascarella and Terenzini (1991), that students’ background had only a trivial influence on educational gains. It may be questioned to what degree findings among US liberal arts colleges are relevant for the professional study programmes in Norway. Nevertheless, these results were supported by Havnes and Aamodt (2004) who also found no effect of parents’ education on learning outcome in professional education.

Type of personality could also be expected to have importance for students’ approach to learning and learning outcome. One of the well established instruments for measuring type of personality is the “locus of control” scale. According to Paulhus (1983), there are three spheres of control: personal efficacy, interpersonal, and socio-political. We expect that students scoring high on the control scale are more goal-oriented, and better prepared to take responsibility for their own learning, and consider the personal efficacy scale to be the most relevant. Neset (1997) found a significant, but not very strong, relationship between scores on the Personal efficacy scale and study behaviour and results among students in their fifth semester at the University of Oslo.

Since the institutional productivity is a major reason for investigating learning outcome, the primary focus is naturally that the quality of the study programme and teaching and learning process is the main factor influencing learning outcome. If the quality of the curriculum and teaching and learning plays a decisive role, we would expect to find differences in learning outcome between fields of study. One could also raise the question on differences between institutions. However, professional education in Norway is to a certain degree regulated by national framework curricula, so we should not expect great variation. Furthermore, our data do cover only a limited number of institutions.

Our data set do not contain any direct, objective information about teaching quality or how the curriculum or the teaching is organised. Therefore, we have to rely on the students’ own expressions about the teachers and the learning environment. Some of the seven principles for good learning practise in teaching at bachelor level formulated by Chickering and Gamson (1987, cited from Kuh et. al. 1997) are relevant in our context. These seven principles are: student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents. In addition, we have used the students’ opinions about the social climate, both between students and between students and teachers, as an indicator.

In addition to students’ background and teaching quality, we consider that students should not be regarded as passive receivers of teaching services, but as active co-players in the learning process. Our analytical model is based on a combination of sociological and

pedagogical theories on student behaviour and student learning. Social and academic integration seems to be important factor in students' success, according to Astin 1984, Pascarella and Terenzini 1980, Tinto 1987). Astin claims that students' learning is related to their involvement and engagement in the study and the institution. The capacity of a university or college to retain students and to enhance their learning is directly related to their ability to keep contact with the students and to integrate them in the social and academic life of the institution (Tinto 1987, Light 2001).

Student involvement is related to how much time they spend on study activities. It is also reasonable to expect that time spent on studies is directly related to learning outcome. The relationship between time to study and results seem, however, to be less clear than one could expect. In a research project conducted at the University of Michigan, no correlation was found between number of hours studied and marks (Schumann et. al. 1985). Other American surveys come to the opposite conclusion (Michaels and Miete 1989). In a study of Norwegian first years students, Berg (1995) found an expected positive correlation between hours spent on study activities per week and examination marks.

Even if we expect to find that study effort, measured in number of hours spent on study activities, has a positive effect on students' learning, it is even more probable that the *quality* of the study work among students is more important. Based on cognitive psychology, it is underlined that students should develop learning strategies, and critically reflecting on their own learning process (Bråten and Olaussen 1997). Furthermore, students should have an active attitude towards the study situation, and also actively involving himself in the learning community (Tinto 1997). An influential research tradition about students' learning is based on the work of Marton and Säljö (1984), describing students' approaches to learning in terms of deep and surface learning. There is a broad range of research conducted inspired by the "approaches to learning" concept (Biggs 1993, Marton, Hounsell & Entwistle 1984 Trigwell and Prosser 1991), and specific research instruments have been developed (Entwistle 1991). These perspectives are very relevant for our present paper, but since our data set do not contain the specific instruments, we cannot directly relate ourselves to this research tradition. These factors do not identify strategies for, or ways of *learning*, so we prefer to use the term study behaviour, which according to Entwistle (1991) is a broader and more general term, including also approaches to learning. We have constructed a scale for measuring students' study behaviour based on the first three principles.

The view on teaching and learning of the active student has been typical for the universities, while professional college training traditionally has been more "school-like". A main tendency among the State Colleges has, however, been a development towards a stronger research orientation, and also adopting teaching methods typical of the universities: fewer teaching hours per week, less compulsory attendance, and a stronger expectation that students work independently (Dæhlen and Havnes 2003). This development has been necessary to leave more time for research among the staff, but at the same time it is moving in the opposite direction of what is aimed in the Quality Reform which prescribes better follow-up of the students.

Furthermore, we assume that student's study effort and study strategy is not given as a result of personal characteristics of the individual student, but depends strongly of the curriculum and the learning context. The study behaviour develops as an interaction

between the individual student and the workload stated in the curriculum, the construction of knowledge, what is demanded from the students, and how students are motivated to work with their studies (Berg 1997). Hulst and Jansen (2002) found that the spread of study activities over the year, instruction characteristics and examination characteristics were found to have effects on the study progress.

The professional programmes included in our project all are female dominated, some of the even strongly female dominated. Do we find gender-specific differences in study effort, study behaviour and learning outcome? In Norwegian schools, both at primary and secondary level, girls perform better than boys, and therefore there is little reason to believe that the situation is totally different in higher education. Previous studies (Aamodt 2003, Wiers-Jenssen et.al.2002), found that female students spent more hours studying than males. It could be questioned whether male students are affected by being the underrepresented sex.

Previous research on Norwegian professional students have concluded that their study strategy might be characterised as “minimalistic” (Dæhlen and Havnes 2003, Aamodt 2003), with a moderate number of hours, on average 30, used for studying per week, and mainly steered by the prescribed curriculum and exams. Students mainly seem to do what they think is necessary to pass exams, not more. Havnes and Aamodt (2004) found that the number of hours studied had only a very weak influence on the learning outcome, while type of study strategy was important. Both an autonomous and an interactive study strategy were positively correlated with learning outcome, while the minimalistic study behaviour had a weak negative effect on learning outcome.

The best way of investigating the qualifications gained through professional education would have been to study how these qualifications are matching the demands that the professional worker are encountering in conducting his or her daily job tasks. This test will have to wait until the next phase of the panel survey. At this stage, we have to limit ourselves to focus on the learning outcome of their education as assessed by the students at the end of the study programme.

An important challenge is then how to measure learning outcome. Our survey data do not contain any examination marks. However, this would not have helped us much, both since many modules of professional programmes are rated only as “passed” or “not passed”, and since the assessment system may vary considerable between programmes and between subjects. Nor do we have access to any other “objective” measures of learning outcome. Therefore, we have to rely on the students’ own self-reporting, and look for process indicators which may represent relevant measurements of student gains. Kuh, Pace and Vesper (1997) have assessed indicators to estimate student gains associated with good practice in undergraduate education, and their findings are especially relevant for our paper. Their main aim is to connect institutional policies and practices that motivate students to devote more time and energy to the learning process. They are pointing at the fact that in American higher education, data have typically been collected to assess what students have learned, or gained from college, but this has generally not been related to the students’ own learning style and how they spend their time. This seems to be the opposite situation of what we have done in Norway: we have conducted a series of studies on how students spend their time (Wiers-Jensen and Aamodt 2002, Aamodt 2003), and also on the study strategies (Dæhlen and Havnes 2003), but so far we have not connected these results to

students' learning and gain from higher education. There are of course also Norwegian studies on students' learning, but normally not based on broad quantitative surveys.

Kuh, Pace and Vesper (1997) base their assessment of students' gain on the College Student Experience Questionnaire (CSEQ), and instrument further into the National Survey of Student Engagement (NSSE), and they claim that student report on gain is a feasible, in many respect the only source of useful data. Cassedy and Eachus (2000, p. 319) similarly found "self-reported proficiency within an academic field to be a positive predictor of academic achievement within that field". Another aspect is that low-achieving students tend to overestimate their achievement. High-achieving students, on the other hand, tend to underestimate their achievements (Boud and Falchikov 1989, Mowl and Pain 1995, Orsmorn *et.al.* 1997, Dochy *et.al.* 1999).

In our paper, even if we have not adopted the NSSE instruments measuring student gains directly, we still rely on students' self-reporting of gain, or learning outcome, and implement these as the dependent variable in our analyses. Like the NSSE, our questionnaire collects information about a broader set of learning outcomes than academic performance, including socio-communicative skills and ethical understanding. Especially for professions who work with people (teachers, nurses and social workers), these qualifications are of high importance. The variables implemented will be described in the next section.

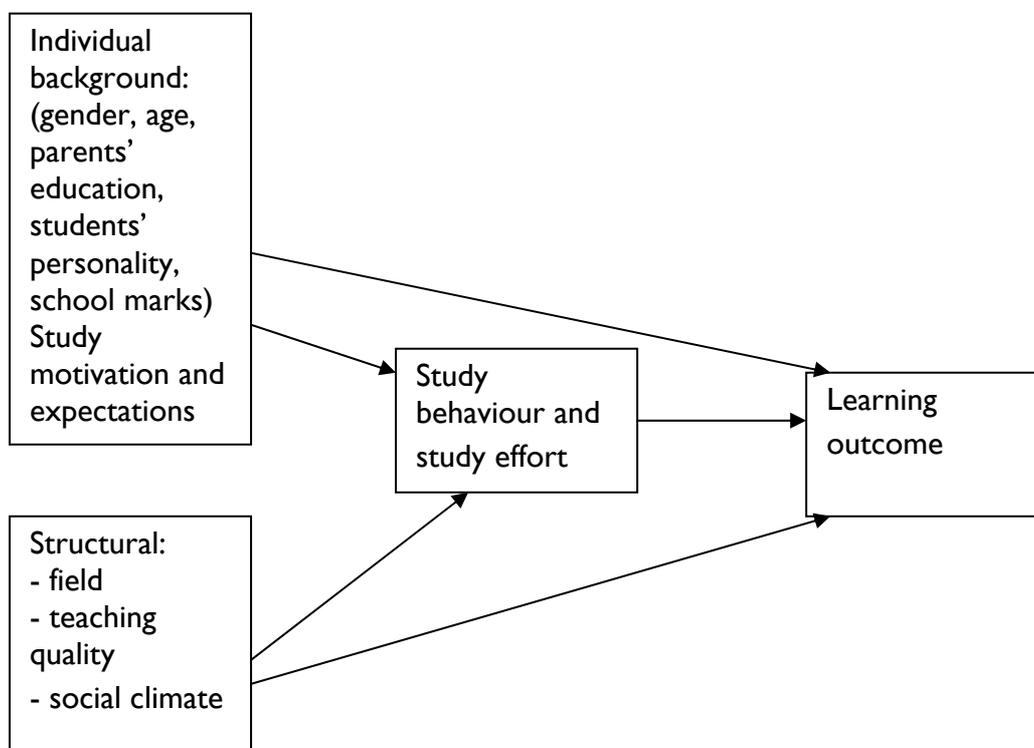


Figure 1: The relationship between background factors, study behaviour and study effort, and learning outcome

In Figure 1, our analytical model is presented, indicating our hypothetical expectation about the relationship between background factors, the students' own study behaviour and study effort, and learning outcome. We expect both direct effects on learning outcome from individual background (gender, age, SE status and previous school achievement), study motivation and expectations for the study (certainty of choice of study, expecting study to be interesting), as well as indirect effect via the students own study behaviour and study effort (number of hour studied per week).

Based on this model, we have formulated three main hypotheses:

1. Learning outcome is positively correlated with high parental education, good grades from previous schooling, and high level of personal efficacy. (These assumptions are raised, even if previous research findings on the effects of students' background on educational outcome point in different directions). We also expect a higher learning outcome among students being certain of their choice of study and expecting study to be interesting
2. Learning outcome is expected to vary between study programmes, and being positively correlated with high teaching quality and good social climate
3. Learning outcome is connected to students' own study effort and an active learning strategy

The first hypothesis is focusing on what students bring with them when they enter higher education, the second hypothesis states that learning outcome is a result of the context, while the third is focusing on what students actually do as students.

As an intermediate hypothesis, we expect that study effort and study strategies are influenced at the one hand by parental education, school marks, personal efficacy, certainty and motivation, and at the other hand by the context (field of study, teaching quality and social climate).

Data and method

This paper is based on "StudData", a panel survey following student cohorts from study start to professional work 2 and 4 years after graduation. The present data set is based on those who started their studies in the autumn 2000, and being in their final term spring 2003. Data was collected both when the students were in their first semester, and in their final. This means that in addition to background information, we have data about their motivations and expectations for the study at study start, as well as their study behaviour and their gain from the study at the end. The data collection is administered by the Centre for the Study of Professions (CSP) at the Oslo University College, and covers students at this institution as well as some other State Colleges. In the first phase, first semester, 3546 questionnaires were distributed, and the response rate was 74 percent. In phase 2, final semester, 3686 questionnaires were distributed, and the response rate was 75 percent. However, in phase 2, the database was extended with some institutions not included in phase 1. In addition, those who completed the questionnaire in phase 2 did not fully overlap with those who

completed phase I, so the number of respondents from whom we have gained data from both phases, is considerably lower: 1215.

The questionnaires were distributed to, and completed by, students during their lectures. This means that students who decide to participate in only parts of the classes, have a lower probability of being included in the data. So far, the analyses based on this dataset, support our impression that there are not serious biases and the data should be considered satisfactory representative.

Definition of variables in the model

Background variables:

- Gender
- Age (as one-year groups, used as a continuous variable)
- Parents highest education (1= mother or father have higher education, 0= neither father nor mother have higher education)
- Marks from upper secondary schools: the average of marks achieved in Norwegian, mathematics, English, and science
- Personal efficacy (as measured by a scale of 10 items (Paulhus 1983))

Motivation and expectations:

- Certainty in choice of study programme
- Expect the study to be interesting

Structural variables:

- Field of study
- Teaching quality (study is well arranged, teaching motivates for self-study, teacher are generally well prepared, teachers are open for questions and to offer guidance, students get constructive feed-back, most teachers are good teachers)
- Social climate (good climate between students and teachers and between students, and a supportive climate among students)

Study behaviour and study effort:

- Average hours spent on study per week
- Study behaviour: active learning index based on a seven point scale from the following items:
 - I try to have a critical attitude towards the content of the programme
 - I prepare myself for classes
 - Discuss with other students
 - Discuss with teachers
 - I am *not* limiting my coursework to what is obligatory
 - I am *not* only concentrating on what is expected at exams
 - I have participated in study groups organised by students
 - I often read material in addition to the obligatory reading list

Learning outcome

Learning outcome is measured by student's assessment along a five point scale of what competencies they have gained from their study on 19 items:

- Broad, general knowledge
- Profession-specific knowledge*
- Knowledge about planning and organisation*
- Understanding on rules and regulations
- Ability to critically reflect and assess own work*
- Creativity
- Ability to work under pressure
- Practical skills*
- Ability to work independent
- Ability to collaborate*
- Ability to take initiatives
- Personal engagement
- Oral communication skills
- Written communication skills*
- Tolerance, ability to value others' opinions*
- Ability of leadership*
- Ability take responsibility and to make decisions
- Ethical skills
- Empathy*

To ensure balance between the different aspects, we ran a factor analysis identifying four main competencies (ethical skills, leadership, vocational/practical skills and theoretical/analytical), and then selected the two items on each component having the highest factor score. However, communicative skills did not appear in any of the four components, and since we consider that as an essential learning goal, we therefore also added written communication as the ninth item in our measurement. The nine items are marked with an asterisk in appendix I. It should be added that our measurement of learning outcome does not cover the specific knowledge of each study programme, but rather a set of competencies which are thought to be common for most programmes (generic skills).

Results

Study effort and study strategies

One of the main premises is that learning outcome is closely related to the effort and learning behaviour of the students. Therefore, as the first step in our analyses, we have conducted linear regression analyses on factors affecting both the study effort (how many hours students on average spend on their study per week), and their study behaviour ("active learning").

Table I: Factors affecting number of study hours per week. Linear regression

	B	Std. Error
(Constant)	35,468**	3,998
Gender: Males = ref.	3,273**	0,976
Age	0,082*	0,033
Personal efficacy	-1,067	0,614
School marks	0,183	0,377
Parents' education: None have tertiary education= ref.	-,326	0,745
Certainty of study choice a)	-0,482	0,291
Expect study to be interesting a)	-2,172**	0,616
Filed of study (ref. = nursing)		
Physiotherapy	1,612	1,654
Other health programmes	0,717	1,276
Teaching	-2,607*	1,188
Social work	-3,744**	1,415
Other programmes	-1,512	1,158
R2 adjusted	0,061	

** $p < 0,01$, * $0,01 < p < 0,05$

a) Low score means agreement

One could expect that older students did spend less time on their studies, due to family responsibility or other activities outside the studies, but the relationship is reverse: older students spend slightly more time on their studies than the youngest ones. Female students spend considerably more time on their studies than men do, this is in accordance with previous Norwegian studies (Wiers-Jenssen, J. et.al. 2001).

One could expect to find an effect of personal characteristics as measured by the personal efficacy scale, but we found no such relationship. One could argue for both a positive and a negative effect of school marks: good students bring with them the habit of working hard, or conversely, good students do not have to work as hard as less prepared students to perform. The results, however, showed no relationship at all between school marks and study effort. Neither did we find any influence of parents' education.

There were no differences in study effort between students who were certain and less certain that they had made the right choice of study, but a positive effect of having high expectations that the study would be interesting.

Both teachers and especially social work students spend less time on their studies than nursing students.

Table 2: Factors affecting study behaviour (active learning). Linear regression

	B	Std. Error
(Constant)	4,383**	0,301
Gender: Males = ref.	-0,212**	0,074
Age	0,008**	0,003
Personal efficacy	0,037	0,046
School marks	0,017	0,028
Parents' education: None have tertiary education= ref.	-0,032	0,057
Certainty of study choice a)	-0,060**	0,022
Expect study to be interesting a)	-0,336**	0,047
Filed of study (ref. = nursing)		
Physiotherapy	0,282*	0,126
Other health programmes	0,161	0,095
Teaching	-0,064	0,090
Social work	0,011	0,105
Other programmes	0,031	0,087
R2 adjusted	0,101	

** $p < 0,01$, * $0,01 < p < 0,05$

a) Low score means agreement

Table 2 shows that older students have a stronger degree of active learning, while female students have a less active learning style than men. This result supports the findings of Magolda (1990). The other background variables (personal efficacy, parents' education, and school marks) at the other hand have no effect on the learning behaviour of the students. Both certainty of choice of study programme and high expectations that studies will be interesting affect learning style in an expected direction.

With the exception of a slightly more active learning style among students of physiotherapy than the reference category nursing, there were no differences between fields of study. The study behaviour therefore seems to be rather equal in the professional studies included in this analysis.

Learning outcome

In analysing the effects on learning outcome, we have adopted a step-wise procedure of linear regression. The first model represent the effects of what students brought with into higher education, that is gender, parents' education, personal efficacy and school marks, and in addition certainty of study choice and expectation are included. In model 2, we introduce the contextual dimension: type of study as dummy variables, using nursing as the reference category, as well as a measure of teaching quality and social climate. The third model represents what students themselves do: that is study effort (study hours per week), and study behaviour (active learning index).

Table 3: Factors affecting learning outcome. Linear 3-step regression

	Model 1		Model 2		Model 3	
	B	Std. Error	B	Std. Error	B	Std. Error
(Constant)	3,938**	0,164	3,222**	0,180	2,873**	0,195
Gender: Males = ref.	0,098*	0,041	0,104*	0,040	0,108**	0,040
Age	0,001	0,001	0,000	0,001	-0,001	0,001
Personal efficacy	0,003	0,026	0,011	0,025	-0,002	0,025
School marks	-0,020	0,015	-0,016	0,015	-0,026	0,016
Parents' education: None have tertiary education= ref.	-0,033	0,032	-0,006	0,030	0,004	0,031
Certainty of study choice a)	-0,021	0,012	-0,023*	0,012	-0,022	0,012
Expect study to be interesting a)	-0,165**	0,026	-0,137**	0,025	-0,095**	0,026
Field of study (ref. = nursing)						
Physiotherapy			-0,099	0,068	-0,122	0,069
Other health programmes			-0,103*	0,052	-0,113*	0,053
Teaching			-0,015	0,049	-0,001	0,050
Social work			-0,135*	0,056	-0,102	0,059
Other programmes			-0,193**	0,047	-0,173**	0,049
Study quality			0,124**	0,015	0,119**	0,016
Social climate			0,029*	0,014	0,018	0,014
Study hours per week					0,002	0,001
Active learning					0,108**	0,017
R2 adjusted	0,062		0,147		0,189	

** $p < 0,01$, * $0,01 < p < 0,05$

a) Low score means agreement

In model 1, the only significant effects on learning outcome come from gender and expectations that the study will be interesting. Female students report a higher learning outcome than male students. None of the background variables like personal efficacy, school marks, or parents' education has any effect on learning outcome. We would have expected effects of school marks and personal efficacy, while the lack of effect of parent's education, based on previous findings, is not surprising.

The effect of gender and expected interest persist, when including the contextual variables in model 2. In all study programmes, a lower learning outcome is reported than in the reference category, which is nursing, but only for "other health programmes" and "other programmes" the differences are significant. The fact that "other programmes" is the groups where learning outcome differs most from nursing is probably related to the fact that this group contain other fields than the "welfare state" educations. This also indicates our assumption that our learning outcome measure is somewhat biased, "favouring" the

professions mostly focused on human relations and care. The results in model 2 also indicate that teaching quality and social climate has positive effects on learning outcome. The variables introduced in model 2 increases the degree of explained variance strongly.

When we introduce the variables measuring the students' own effort and study strategy in model 3, the degree of explained variance is increasing further. The effect of and field of study is kept unchanged while the effect of expectations for the study is somewhat reduced. Study effort, as measured by study hours per week, has no any significant effect on learning outcome. In the literature the links between study effort and results are contradictory. Schuman et.al. (1985) found no relationship between hours studied per week and marks, while Michaels & Miete (1989) and Berg (1995) found an expected effect of study hours on results. Study behaviour in terms of active learning, on the other hand, has a considerable effect. Students with an active learning style do report significant higher learning outcome than students who are mainly directed by exams and obligatory reading lists, and who do not collaborate with other students or seek advice from teachers. *Quantity* of study work therefore seems to be less important than the *quality* of the work. It is furthermore possible that the lack of effect of study hours may be due to two opposite relationships: that the best students do not have to work as hard as weaker students, and that good marks are due to hard working in school, working habits students continuing in higher education. Another explanation could be that there are few incentives within these programmes to work harder than necessary to keep up with what is demanded from the students. A majority of the professional student are adopting a "minimalistic" (or perhaps "pragmatic" is a better term) study behaviour, according to Dæhlen & Hvanes (2003): student are doing what they consider expected from them, and little more. According to Havnes & Aamodt 2004, both autonomous and interactive learnig styles are positively correlated with learning outcome, while a minimalistic style has a weak negatively effect.

Discussion

Our analytical model to analyse the factors affecting learning outcome is based on three simple assumptions. First, that learning outcome is determined by the resources and the characteristics students bring with them, while schooling itself has no effect. The second assumption is an instrumentalist one: learning outcome is "produced" by the curriculum and the quality of teaching, while the third assumption is that learning is a result of what students themselves do during the daily learning work. Our main assumption is, however, that we would find effects of all these three set of factors.

Our first hypothesis was only partially supported in the data. Study motivation, measured as a positive expectation that the study would be interesting, had a positive effect on learning outcome. But we found no effect of parents' education, school marks or personal efficacy. However, the lack of influence from family background and marks is not a unique finding. Astin (1993), Pascarella and Terenzini (1991) and Kuh, Pace and Vesper (1997) also found that family background was without affect on learning outcome. A possible explanation is that the value of cultural capital is less in professional studies than in the academic university programmes.

Furthermore, Kuh, Pace and Vesper (1997) also found that school marks had only a weak effect, and explains this as being a result of a relatively high degree of homogeneity among the students due to the previous selection process. This explanation may be valid also in our context. In addition, it may be that the professional programmes have a broader set of criteria for the learning goals, rewarding academic performance less, and practical skills and human relations skills more than the traditional university programmes. Furthermore, a large proportion of the students in the professional programmes have relevant vocational experience which to a certain degree may compensate for weak academic school performance.

How then could we explain that female students are reporting a higher learning outcome than male students? Is it possible that there is a bias in the sense that female students simply make a more positive judgement even if the results are at the same level? Or do they actually perform better, at least in these study programmes? Could a weaker outcome among men be due to the fact that they are underrepresented in these studies? Or do the professions in health, teaching and social work simply reward certain generic skills which are more strongly represented among women than among men? We have to limit ourselves to raise these questions rather than coming up with any distinct explanation.

The differences in learning outcome between study programmes which we have identified are not easily interpreted. The fact that the learning outcome is higher in nursing studies than in any other programme is not necessarily telling us that the nursing programmes have a higher quality. One possible explanation is that our way of measuring learning outcome has a certain field specific bias and not equally relevant in all studies. But it is possible that there exist characteristics in the curriculum or the organisation of teaching which cannot be observed directly in our material being responsible for the observed patterns.

What seem to be the most important factors behind a positive learning outcome is the quality of teaching, the social climate, and that the students themselves develop an active learning profile. Our initial assumption that students are not passive receivers of teaching and instruction, but active participants who's own effort makes a difference is supported from our findings. We also think that it is reasonable to argue that our findings indicate that students' study behaviour and learning outcome is not entirely varying according to individual characteristics, but also connected to teaching styles and organisation of the learning environment. The fact that we found no effects of important individual characteristics like school marks, personal efficacy or parents' education do of course not exclude that other, non-observed individual factors have an effect, but at the other hand, the results indicate that individual factors alone can not explain learning outcome. We do not know, however, what specific factors within the learning environment which are the most important ones, but Trigwell & Prosser (1999) have reported an effect of teachers' approaches to teaching and students' approaches to learning.

Our findings also support some of Chickering & Gamson's (1987) seven principles for good teaching and learning, especially student-student and student-teacher contact, and for an active learning style. Students who contact teachers for support, collaborating with other students, working independent with a critical approach, read literature in addition to what is prescribed in the curriculum, have better chances to obtain a positive learning outcome from

their professional education. The findings may also support the importance of creating active learning communities (Tinto 1997).

At the other hand, a minimalistic learning strategy is more predominant than an active learning style (Havnes and Aamodt 2004). Students tend not to invest more time or effort in the learning process than needed. This supports the findings of Elen and Lowyck (1998) that students seem to prefer traditional teaching methods, and in addition want to get as much learning out of the least possible effort. Perhaps this rather rational and instrumentalist approach also explains why we don't find any effect of study hours per week on the learning outcome. Students spend as many hours studying they think is needed to obtain a satisfactory learning result. This means that students who learn quickly limit their effort once they think they have obtained a satisfactory level of learning outcome. To reach that level weak students, or students who need more time spend many hours per week, while strong or quick students limit their effort rather than aiming for a higher level of outcome. If this is the case, it could also be questioned whether there is a lack of incentives from the institutions towards students to try to reach as high learning outcome as possible.

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