The Shaping of Professional Competencies

Per O. Aamodt
Centre for the Study of Professions
Oslo University College

Qualifications for professional work contain a broad set of components; theories, ethics, practical skills etc., and are based on a combination of individual suitability, training and work experience. Some of these qualifications are specific for the specific professions, e.g. nursing, teaching and social work, while other competence components are shared by the professions. Formal education plays a crucial role in preparing professional workers for their future work, and there is a wide-spread concern that the quality of the educational programmes is below acceptable standards. This paper is focusing on the quality of the learning process and the learning outcome in professions like nursing, other health professions, teaching, social work and others, often also termed "semi-professions".

Introduction

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, 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 among others a new degree structure according to the Bologna declaration, and with a strong focus on quality in teaching and learning. 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 news 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.

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. We expect students' learning to be affected by individual factors (ability, previous experiences, and motivation), and quality of the study programme and teaching methods, but in addition we expect that the students' own effort and study behaviour plays a decisive role. Students should not be regarded as passive receivers of teaching services, but as active co-players in the learning process. This view on teaching and learning 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.

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 and 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.

Rather, we will try to systematise study behaviour according to 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). These seven principles are: student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents. 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 main focus of this paper is the relationship between study behaviour and learning outcome. Learning outcome is of course related to a range of other factors, both individual and structural, and we intend to take also these factors into consideration.

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. According to Shavit & Blossfeld (1993), inequalities in educational attainment still exist among most countries. This is generally the case also in Norway (Hansen 1999). These differences are both related to the preferences and choices made by youth from different social classes, but also related to different achievement levels due to cultural barriers, values etc. (Boudon 1974, Bourdieu & Passeron 1992). 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.

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.

We would naturally expect that learning outcome to be closely related to the individual aptitude of the student. 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 expect similar results in our sample.

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 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.

Even if study behaviour and learning outcome are affected by individual characteristics, we also expect structural factors to be important. In this paper we are mainly concerned about differences between fields of study. Students' behaviour may be affected by the amount of workload in the specific curricula, teaching and learning environment, and the construction of knowledge (Berg 1997).
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 what they think is necessary to pass exams, not more.

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 at the end of the study programme.

Our first 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 they claim that student report on gain is a feasible, in many respect the only source of useful data. In our paper, even if we have not adopted theses instruments directly, we therefore will rely on students' self-reporting of gain, or learning outcome, and implement these as the dependent variable in our analyses. The variables implemented will be described in the next section.

Our primary research question in this paper is: how is student learning in professional education affected by individual background factors, field of study, and study behaviour? An

intermediate question is: how do study effort and study behaviour vary according to individual background and field of study?

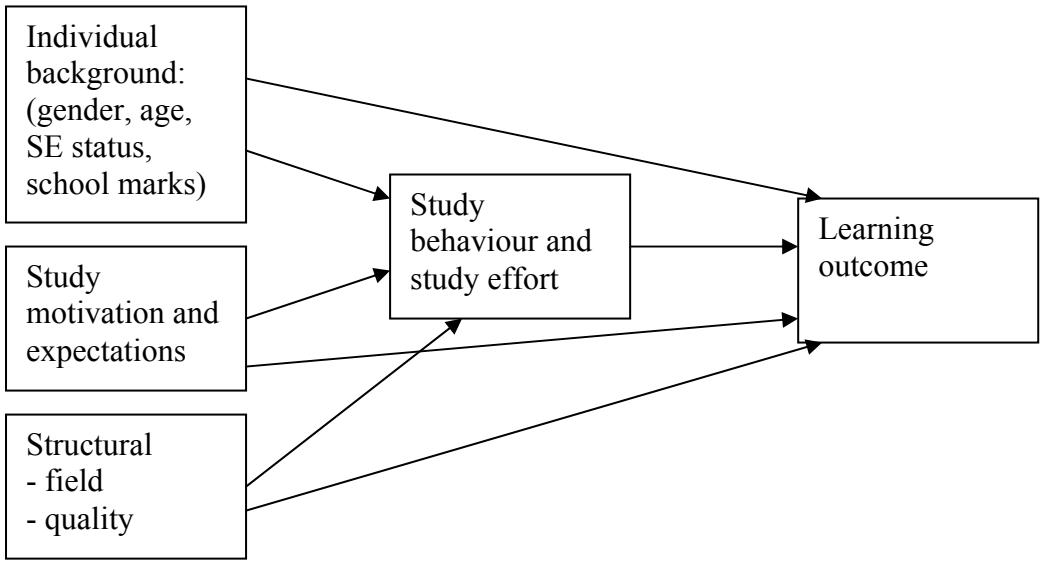


Figure 1: The relationship between background factors, study behaviour and study effort, and learning outcome

In Figure 1, out 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).

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 on 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 expectation 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 2. In addition, those who completed the questionnaire in phase 2 did not fully overlap with those who completed phase 1, so the number of respondents from whom we have gained data from both phases, is considerably lower: 1215.

Data was 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 representativity could be considered satisfactory.

Definition of variables in the model

Background variables:

- Gender
- Age (as one-year groups)
- SE background: parents highest 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
- General satisfaction of study (five point scale)

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

*Since we found no effects of parents' education, we have excluded this variable from the analyses

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 18 items. (The items are shown in Appendix 1)

Results

On 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 how many hours students on average spend on their study per week, and their study behaviour ("active learning").

Table 1: Factors affecting number of study hours per week. Linear regression

	B	Std. Error
(Constant)	**35,404**	3,994
Personal efficacy	-1,092	0,611
School marks	0,188	0,376
Age	*0,082*	0,033
Gender: Males = ref.	**3,273**	0,972
Certainty of study choice*	-0,486	0,291
Expect study to be interesting*	**-2,164**	0,616
Filed of study (ref. = nursing)		
Physiotherapy	1,557	1,658
Other health programmes	0,712	1,276
Teaching	*-2,639*	1,185
Social work	**-3,755**	1,414
Other programmes	-1,553	1,154
R2	0,061	

* 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, 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.

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)	**4,374**	0,300
Personal efficacy	0,034	0,046
School marks	0,018	0,028
Age	**0,008**	0,003
Gender: Males = ref.	**-0,208**	0,074
Certainty of study choice*	**-0,060**	0,022
Expect study to be interesting*	**-0,336**	0,047
Filed of study (ref. = nursing)		
Physiotherapy	*0,277*	0,126
Other health programmes	0,161	0,095
Teaching	-0,067	0,090
Social work	0,010	0,105
Other programmes	0,028	0,087
R2 adjusted	0,101	

* Low score means agreement

Neither personal efficacy nor school marks have any effect on the learning behaviour of the students. This is perhaps even more surprising than the lack of relationship with study effort.

Older students have a stronger degree of active learning, while female students have a less active learning style than men. Both certainty in choice of study 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. Studying behaviour therefore seems to be rather equal in the professional studies included in this analysis.

In analysing the effects on learning outcome, we have adopted a step-wise procedure of linear regression. In the first model, only background variables, certainty of study choice and expectation are included. In model 2, we introduce type of study as dummy variables, using nursing as the reference category. In the third model, we include general satisfaction as an indicator of quality of the learning environment, 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)	**3,909**	0,156	**3,906**	0,159	**2,808**	0,180
Personal efficacy	0,006	0,024	0,006	0,024	-0,008	0,024
School marks	-0,022	0,015	-0,015	0,015	-0,020	0,015
Age	0,001	0,001	0,001	0,001	-0,001	0,001
Gender: Males = ref.	**0,113**	0,039	**0,121**	0,039	**0,108**	0,038
Certainty of study choice	-0,016	0,012	-0,018	0,011	-0,010	0,011
Expect study to be interesting	**-0,181**	0,025	**-0,179**	0,025	**-0,097**	0,025
Filed of study (ref. = nursing)						
Physiotherapy			-0,076	0,068	**-0,204**	0,066
Other health programmes			0,002	0,051	*-0,102*	0,051
Teaching			0,018	0,047	-0,048	0,047
Social work			-0,098	0,056	**-0,199**	0,057
Other programmes			**-0,134**	0,046	**-0,228**	0,047
General satisfaction					**0,187**	0,020
Study hours per week					0,002	0,001
Active learning					**0,123**	0,016
R2	0,08		0,091		0,225	

* Low score means agreement

Considerations whether the learning outcome is satisfactory or not is made difficult by the fact that we don't have a fixed standard for what is an acceptable level. The index for learning outcome is based on a five-point scale for 19 different items. Since the constant in model 1 is 3.9, the students' assessment of their learning outcome is above average, and hence more positive than negative.

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. These relationships persist, and do not change considerably when including field of study in model 2. With the exception of the group "other programmes", there are no significant differences between fields of study.

However, when we introduce the variables in model 3, we see some interesting changes in the relationships. First of all, the degree of explained variance is increasing strongly. The effect of both gender and expectations for the study is somewhat reduced. In this model, we see that significant differences between fields of study arise. With the exception of teaching, all study programmes do report a lower learning outcome than students in nursing. This is somewhat surprising, since nursing students generally seem to be less satisfied with their study, but it makes sense because the differences appear when controlling for satisfaction, and in this analysis there is a significant relationship between degree of satisfaction and learning outcome.

Another surprising result is that study effort, as measured by study hours per week, do not have any significant effect on learning outcome. In the literature, however, 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, 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" study behaviour, according to Dæhlen & Hvanes (2003): student are doing what they consider expected from them, and little more.

Another surprising result is that neither school marks nor personal efficacy seem to have any effect on learning outcome in any of the three analytical models. Of course this may be connected to certain weaknesses in the variables used to indicate learning outcome. Another explanation, which may be valid for more of our findings, is connected to the type of study programmes we are focusing on: professional, predominantly vocational programmes. It is possible that e.g. upper secondary school marks have a stronger explanatory power for academic programmes than for these professional ones.

Discussion (preliminary)

First, we thing these results make a solid evidence for our supposition that students' own learning style is essential for their learning output. Students are not passive receivers of learning, but active participants. It is also a support for some of Chickering & Gamsons (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.

This raises the question about how such "good" learning styles originates? Are they mainly connected to personality characteristics, affected by socio-economic origin and strongly related to previous schooling achievement? Or, is learning style possible to learn, and to be affected by the way learning is organised in the specific programme?

We think 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.

There are some important implications from the interpretations of the results. First, our assumption that it does matter what students do themselves is supported. Second, good study behaviour is not entirely originating from the students' individual characteristics, but also an

object of influence from study organisation, curriculum, and the learning environment in broad terms. Good study behaviour seems to be essential for learning outcome, and learning outcome may be increased most efficient by stimulating good learning strategies among students.

References

Arnesen, C.Å. (2003): *Grunnskolekarakterer våren 2003*. Oslo, NIFU skriftserie 32/2003

Astin, A.W. (1984): Student involvement: A Developmental theory for higher education. *Journal of College Student personell*, 25: 297-308.

Berg, L. (1995): *Eksamen philosophicum: Studietilknytning, innsats og resultat for ulike grupper av begynnerstudenter ved Universitetet i Oslo*. Rapport 2/95. Oslo: Utredningsinstituttet for forskning og høyere utdanning

Berg, L. (1997): *Studieløpet. Om tidsbruksvalg, faglige valg og kunnskapsteoretiske valg*. Oslo, NIFu rapport 3/97

Biggs, J.B. (1993): From Theory to Practice: A cognitive Systems Approach. *Education Research and Development,* 1/93

Bråten, I. & B.S. Olaussen (1997): *Strategisk læring hos norske høgskolestudenter. En foreløpig rapport*. Oslo, HiO-rapport 1997 nr 3

Chickering, A.W. & Z.F. Gamson (1987): Seven Principles for good Practices in Undergraduate education. *AAHE Bulletin* 39(7): 3-7

Dæhlen, M, & A. Havnes (2003): Å studere eller å gå på skole? Studiestrategier i profesjonsutdanningene. I Aamodt, P.O. og L.I. Terum (red.): *Hvordan, hvor mye og hvorfor studerer studentene? Om læringsmiljø, jobbpreferanser og forståelse av kompetanse i profesjonsutdanningene*. Oslo, HiO-rapport 2003 nr 8

Eikeland, O.J. (187): *Studentar og karakterar*. Bergen, UNIBUT 2/1987

Entwistle, N.J. & A. Entwistle (1991): Contrasting forms of understanding for degree examinations: the student experiences and its implications. *Higher education 22,* 205-227

Grøgaard, J.B. (1995): *Skolekontroversen*. Oslo, FAFO

Kuh, G.D, C.R. Pace & N. Vesper (1997): The Development of Process Indicators to estimate Student Gains associated with good Practices in Undergraduate Education. *Research in Higher Education*, Vol. 38, No. 4 1997 s. 435 - 455

Light, R.J. (2001): *Making the most of college. Students speak their Minds.* Cambridge (Ma), London: Harvard University press.

Marton, F. & R. Säljö (1984): Approaches to learning. In Marton, F., D.J. Hounsell & C.M.L. Miller (eds.): *The Experience of Learning.* Edinburgh, Scottish Academic Press, pp 36-55

Michaels, J.W & T.D. Miete (1989: Academic effort and college grades. *Social Forces* 68: 309-39.

Norgesnettrådet (1999): *Basert på det fremste…? Om evaluering, kvalitetssikring og kvalitetsutvikling av norsk høyere utdanning.* Rapport 2/99 Oslo: Norgesnettrådet

Pascarella, E.T. & Terenzini (1980): Predicting freshman persistence and voluntary drop-out decisions from a theoretical model. *Journal of Higher Education,* 51: 50-75.

Paulhus, D. (1983): Sphere-Specific Measures of Perceived Control. *Journal of Personality and Social Psychology.* Vol 44, No. 6, 1253-1265

Schumann, H., E. Walsh, C. Olson & B. Etheridge (1985): Effort and Rewards: The assumption that College Grades are Affected by Quantity of Study. *Social Forces* 63: 946-66.

Tinto, V. (1987): *Leaving college: rethinking the causes and cures of student attrition.* Chicago: The University of Chicago Press.

Tinto, V. (1997): Classrooms as communities: Exploring the educational character of student persistence. *Journal of Higher Education,* 68, s. 599-623

Trigwell, K. & M. Prosser (1991): Improving the quality of student learning: the influence of learning context and approaches to learning on learning outcome. *Higher education 22,* pp 251-266

Trigwell, K. & M. Prosser (1999): Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education 37,* 57-70

Vibe, N. (1994): Veien fram til høyere utdanning. I *Utdanning og arbeidsmarked 1994*. Oslo, Utredningsinstituttet

Wiers-Jenssen, J. & P.O. Aamodt (2002): *Trivsel og innsats. Studenters tilfredshet med lærested og tid brukt til studier. Resultater fra "Stud.mag."-undersøkelsene*. Oslo, Rapport 1/2002, NIFU

Wiers-Jenssen, J., B. Stensaker & J.B. Grøgaard (2002): Student Satisfaction: Towards an Empirical Deconstruction of the Concept. *Quality of Higher Education, 8,* pp 183-195

Aamodt, P.O. (2003): Tidsbruk og studieinnsats. I Aamodt, P.O. og L.I. Terum (red.): *Hvordan, hvor mye og hvorfor studerer studentene? Om læringsmiljø, jobbpreferanser og forståelse av kompetanse i profesjonsutdanningene*. Oslo, HiO-rapport 2003 nr 8

Appendix 1

Questionnaire items measuring learning outcome

- Broad, general knowledge
- Profession-specific knowledge
- Knowledge about planning and organisation
- Understanding on rules and regulations
- Ability to critically reflect and asses own work
- 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