

English summary

Background:

Knowledge of how students go about their studies can be valuable for teachers, study counselors, and researchers, and with an increasing societal demand towards effectiveness and competence in higher education, there has been an increased interest in investigating and assessing student learning and study strategies.

Historically, several theoretical positions have dominated the landscape of learning theories: The behaviourist position, cognitive approaches, the information processing position (IP), and constructivist e.g. the Student Approach to Learning (SAL). The more recent perspective as SAL was developed in attempts to amend various limitations of the previous positions, e.g. the low ecological validity of stimulus-response- and memory-focused cognitive laboratory research, and focuses on academic learning research as the study of the student's construction of meaning carried out in the natural educational settings.

The SAL perspective on students draws upon the Presage, Process, and Product (3P) model suggested by Dunkin and Biddle (1974) and the pioneering studies by Marton and colleagues (Marton and Säljö, 1976a;b). This model focuses on the interrelationship between personal characteristics of the students, the situational constraints in which they find themselves, their approach to learning, and the outcome of learning. Students' perceptions of teaching and learning context are seen as a result of the interaction between their previous experiences of teaching and learning and the context itself.

Marton & Säljö (197a;b) identified two basic levels of processing: a *surface* and a *deep level*, and subsequent research in the area has consistently confirmed these two broad approaches to learning. *Deep level processing* is generally characterized by a "a genuine preference, and ability, for working conceptually rather than with unrelated detail" (Biggs, 2003), and is likely to be promoted by teaching methods promoting critical thinking and meaningful interaction, where students are given the opportunity to challenge and question, and when the learning task is perceived to be relevant to student's interests. In contrast, *surface level processing* seems more determined by non-academic priorities, insufficient time, high anxiety levels of the students, by an instructional environment unable to bring out the intrinsic structure of the learning material, and by assessment methods rewarding reproduction of information.

Studies of learning approaches and learning outcomes have found deep approach to be most consistent with the goals of higher education and to be related to higher quality learning outcomes, while a surface approach is usually found associated with lower quality outcomes. Given that

learning approaches appear to be highly susceptible to outside influences, especially the learning environment, knowledge about the factors influencing learning approach can assist teachers in developing and implementing teaching strategies that encourage appropriate learning strategies.

Aim of the PhD-project:

Factors, which can explain the variance in learning approach of students in Higher Education, have been extensively studied in the international context. The available studies, however, have often been based on relatively small samples and have generally focused on few selected variables. Furthermore, only very little is known about student learning in the Danish University context. The aims of the present PhD-project were therefore: 1) to translate into Danish one of the most widely used instrument assessing students' approach to learn, the Study Process Questionnaire (SPQ) (Biggs 1987; 2001), and to provide a preliminary test of its reliability and validity in a sample of Danish university students, and 2) to use the instrument to explore the learning approaches of Danish university students and – following the 3-P model – to identify the major a) *presage factors*, i.e. student background characteristics and institutional and teaching context variables, and b) *motivational factors*, i.e. perception of the teaching environment, self-efficacy, and test-anxiety, which could explain the variance in *Deep* and *Surface learning approach* of Danish university students. Based on a review of the existing, international SAL research, a number of specific hypotheses concerning the associations between various presage and process factors and Deep and Surface approach were stated and tested.

The methods and results have been described in the three papers included in the present thesis:

- Lassen B. Learning Strategies in a Danish university context - Testing the reliability and validity of the Revised Two-Factor Study Process Questionnaire. (PAPER 1)
- Lassen B, Jensen T.K. Demographic and Contextual predictors of student approaches to learn and in a large sample of Danish university students. (PAPER 2)
- Lassen B, Jensen T.K. Motivational factors as predictors of student approach to learning (PAPER 3)

Summary of methods:

A total of 1350 questionnaires were handed out at lectures and seminars to undergraduate (3rd semester) and graduate students (7th and 9th semester) recruited from four major faculties at Aarhus University: Arts, Social Science, Health Science, and Science. A total of 1192 questionnaires were returned (response rate: 88.3%). The 1083 students who had completed all items of the R-SPQ-2F (80.2%) were included in the validation study of the questionnaire (PAPER 1). The 1181 students who had responded to all questionnaires in the questionnaire package (response rate: 87.5 %), but

had not necessarily completed all items of the R-SPQ-2F, were included in the subsequent analyses of the potential presage- and process predictors of Deep and Surface approaches to learn (PAPER 2 and 3).

The *dependent* variables were *Deep* and *Surface* levels of approach to learn (R-SPQ-2F). The *independent* variables explored were student background characteristics and institutional and teaching context variables. The *background* variables included age, gender, socio-economic background measured through parental educational background, High School GPA, their secondary education, current study level, and current GPA. The *context* variables were faculty, the teaching method used in the course they were taking and the assessment methods to be used at the end of the course. In addition, the following *motivational* factors were assessed: Intrinsic and extrinsic motivation to study, academic self-efficacy, test-anxiety, the perception of the current learning environment, and the importance they placed on the learning environment characteristics.

Analyses:

The preliminary reliability and validity of the R-SPQ-2F-DA was analyzed with descriptive and reliability statistics (internal consistencies; Cronbach's alpha) and confirmatory factor analyses (CFA), following the analytical steps described by Biggs et al. (2001) for the English-language version of the R-SPQ-2F (PAPER 1). In subsequent studies (PAPER 2 and 3), the predictors of learning approach were analyzed with both unadjusted bivariate and multiple regression analyses with Deep and Surface Approach as dependent variables, adjusting for the other independent variables investigated. In each analysis, the selection of predictor variables and the order in which they were entered in the multiple regression models were based on theoretical grounds, i.e. the 3P model (Biggs, 1987).

Summary of results:

PAPER 1: Internal consistencies of the subscales of the Danish R-SPQ-2F were higher or comparable to those reported for the English-language original. CFA suggested moderately acceptable fit at the item-level (CFI= 0.815; SRMR= 0.07; GFI= 0.874) with further analyses indicating the lesser fit to be primarily related to one the subscales: Surface Strategy (SS). A model treating the subscales as indicators of the two latent factors, Deep (DA) and Surface Approach (SA), showed better fit (CFI= 0.927; SRMR=0.05; GFI= 0.952). The results indicated that a 19-item Danish version of the R-SPQ-2F could be used for further analyses with the aim of providing preliminary data for Danish university students

PAPER 2: Further analyses showed that the main independent presage (background and contextual) predictors of higher scores on Deep approach to learn were: older age, female gender, higher High

School Grades, intrinsic motivation to study, studying at the faculties of Arts and Social Sciences, and small-group seminar as the teaching method. Among the independent predictors of higher Surface approach scores were: younger age, lower high school grades, studying at the faculties of Health Sciences and Science, lower current GPA, and lectures as teaching method. The final models, however, explained no more than 7% of the variance of Deep Approach and 10% of the variance in Surface approach.

PAPER 3: In the third study the associations of psychological motivational factors of academic self-efficacy, test-anxiety, and the perception of the teaching environment and the perceived importance of the teaching environment with Deep and Surface Approach were explored while controlling for the previously investigated were examined, where the results showed that each of the student motivational factors of self-efficacy, test-anxiety, and perception and importance of the teaching environment were strong independent predictors of students approach to learning, even when taking other motivational, background, and institutional factors into consideration. When adding the motivational factors to the models, the explanatory power was increased considerably to 28% of the variance in Deep and 21% of Surface approach.

Discussion and conclusions

First, the results indicated that the Danish version of the R-SPQ-2F could be used for further analyses, and the results of the subsequent analyses supported the validity of the instrument in a Danish context. However, the results also suggested that further adjustments, primarily of the Surface Strategy (SS) subscale, are needed to establish a suitable version of the SPQ for Danish university students.

Second, several of the results were consistent with several reported findings in the international literature on SAL, mainly that Deep approach was associated with older age, higher HSGAP, current GPA, intrinsic motivation to study, and studying subjects associated with “soft” sciences such as the Arts. Furthermore, the results confirmed that the contextual factor of small-group teaching methods, e.g. seminars or lectures in combination with seminars, was associated with greater tendencies to use Deep approaches to learning. Somewhat surprisingly, assessment methods did not emerge as an independent significant predictor when adjusting for the remaining factors, which could be due to shared variance or interactions with some of the other factors, e.g. faculty and teaching method. Likewise, results previously found for Surface approach were also generally confirmed. Taken together, the results indicated that the background and contextual factors only explained a relatively modest proportion of the variance in students approach to learn, suggesting that other factors, e.g. more direct motivational factors, could be relevant to explore.

Third, that motivational factors could add to our understanding of SAL was confirmed by the findings that academic self-efficacy, test anxiety, and the perception and importance of the learning environment were important predictors of approach to learn, adding considerably to the explanatory power of the models. Although successful learning largely depends on knowledge and skills, motivational factors such as self efficacy and test anxiety also play an important role as predictors of students' learning approaches, and subsequent learning outcomes. The results also indicated that perceiving the learning environment as stimulating problem solving, scientific thinking, and exam preparation in concordance with a deep approach to learning was an equally important predictor as self-efficacy.

Strengths and limitations

To this author's knowledge, SAL has not previously been explored in the Danish university context, and the results thus add to the cross-cultural validation of both SAL as a model of learning and the SPQ as an instrument to assess SAL. The present study has several *strengths*. First, the majority of previous studies have used relatively small samples of convenience and have frequently only included relatively few predictors in each study, which means that the associations between the predictors and SAL have rarely been adjusted for other - potentially confounding - factors. In the present study it was attempted to amend these weaknesses by including one of the largest samples in this area of research with students at different study levels from several faculties representing both "soft" and "hard" disciplines, thereby increasing the representativity of the sample. Second, the large sample allowed for statistical adjustment for several relevant factors using a multivariate approach, enabling comparison of unadjusted bi-variate associations with results adjusting for the remaining factors investigated. Our results thus support several previous findings, which mainly have been explored in studies based on relatively small samples and focusing on a few selected variables. Third, the empirical evidence concerning the influence of expectancy and affective motivational components on study behavior is so far very limited, and the model of learning was therefore expanded in the present study to include these motivational variables while adjusting for other factors known to influence student approaches to learning. Finally, attempts were made to ascertain that the main instrument to measure the dependent variable, the R-SPQ-2F, was translated following the general recommendations for cross-cultural adaptation, tested in a pilot study, and its psychometric properties explored with the appropriate methods, e.g. confirmatory factor analysis prior to the analyses of the final dataset.

In spite of the strengths described above, a number of potential challenges and limitations of the present study should also be noted. First, while the number of participants is large, we cannot be certain that the sample is sufficiently representative, as all students were from Aarhus University.

Second, while the overall response rate of 88.3% can indeed be considered highly satisfactory, the total number of students at the master level included was somewhat smaller than originally intended, which could affect the statistical power to detect differences associated with study level. Third, a potential limitation of the present study is the quantitative questionnaire-based methodology used. Quantitative methods imply reductionism, and the explanatory power could of course be challenged if the suggested model, as it is operationalized in the SPQ, does not sufficiently capture the fundamental nature of the factors related to SAL. Finally, while the SPQ has been used in a large number of international studies, it had not previously been used in a Danish context, and evidence for the reliability and validity of the Danish adaptation is still not fully available, as indicated by the less than satisfactory results for the Surface subscales, in particular the SS-subscale.

Conclusion and perspectives

Students' approaches to learning (SAL) vary. Deep approach, i.e. studying to develop personal understanding, has been found to correspond more to the requirements in higher education than Surface approach, i.e. studying with the purpose of reproducing knowledge at a later time. Similar teaching and learning environments are not experienced in a similar way by the students attending, and teachers as well as administrators in higher education should be aware of factors that may either promote or hinder students in actively engagement and development of their own individual understanding of what is being learned.

While being significant independent predictors, factors that can be influenced through recruitment, e.g. age, gender, HSGPA, study choice motivation, and previous educational experience, were only relatively weak predictors of SAL. The results indicate that although there seems to be good reason to continue the current admission requirements, it is also important that students have a genuine interest for the subject they have chosen.

Among the more salient predictors were teaching methods and – most prominently – motivational factors such as academic self-efficacy, test anxiety, and perception of the teaching environment as promoting deep approaches to learn. The results thus indicate that the learning environment and learning objectives, the student's perception of these, and the perceived capacity to succeed at the task in question are potential important variables through their effects on student motivation and learning, regardless of the remaining demographic, institutional, and contextual variables. Therefore it is essential to facilitate active student collaborating, problem solving learning activities in which students are given the opportunity to regulate their own learning activities and form their own

opinion of what is being learned. Learning practices should as far as possible go beyond trivia and simple memorizing for examinations.

Although it could benefit from adjustments, the availability of an instrument such as a Danish version of the R-SPQ-2F creates opportunity for 1) further examination of the quality of the learning activities in the university context, 2) raising students' awareness of their own approach to learning and 3) investigating the impact of training and of changes in the teaching/learning system