

Student approaches to learning
– results, applicability and consequences

Berit Lassen

STUDENT APPROACH TO LEARNING
AN EMPIRICAL INVESTIGATION OF STUDENT APPROACHES TO LEARNING

Berit Lassen

UNIVERSITY OF AARHUS

Berit Lassen MSc, Political Science 1

Themes of the presentation

- Background:
 - Challenges in higher education
 - Introduction to Student learning theory (SAL)
 - Introduction to a system-based model of learning (the 3P-model)
 - Measures of SAL
 - Empirical findings and limitations in these
- Aims
- Methods
- Results of study 1, 2 and 3
- Practical implications and scientific perspectives
- Strengths and limitations

Berit Lassen MSc, Political Science 2

Goals and challenges in Danish higher education

- Since the 1960s, the Danish higher educational system has changed from "elite" to a "mass system", and a greater proportion of the student population now spring from families with other than academic background
- Increased diversity among students - Some students wish to pursue an interest – others are affected by outside pressures from e.g. family or a desire to progress towards desired career options
- Student demands and expectations of education and training.
- Increased focus on efficiency and integration with business interests and needs
- Demands are high with respect to have good grasp of study requirements

Berit Lassen MSc, Political Science 3

The Ph.D. project consists of three aims

- To adapt one of the most widely used instruments which explain the variance in the use of Deep and Surface approaches to learning among Danish university students, and to provide a preliminary test of its reliability and validity (Paper 1)
- Furthermore to use the instrument to identify the major
 - presage factors, i.e. student background characteristics, institutional and contextual variables predicting student approaches to learning (Paper 2)
 - and motivational factors, i.e. perception of the teaching environment, self-efficacy, and test-anxiety predicting student approaches to learning (Paper 3)



What is SAL?

Students Approaches to Learning concerns what students do when they go about learning and what motivates them to do it.

(Case, 1999)



Student approach to learning

- From qualitative and quantitative research carried out in Sweden and Britain during the 1970s two main approaches to studying in higher education were identified:
 - a deep approach, based upon understanding the meaning and the underlying structure of the learning material;
 - a surface approach, - signifying a reproductive type of learning based upon memorizing for the purpose of later reproduction

2005)

(Richardson,



A student's approach to learning is thought to have two components:

Motive;
Why the student wants to approach it

Strategy;
How the student approaches the task

(Biggs, 1987)



Deep level processing seems determined by:

- *An intrinsic interest in the task, and*
- *"a genuine preference, and ability, for working conceptually rather than with unrelated detail" (Biggs, 2003, p. 17)*

While surface level processing seems more determined by:

- *non-academic priorities, focus on information in an atomistic way, and by assessment methods rewarding reproduction of information (Fransson, 1977)*



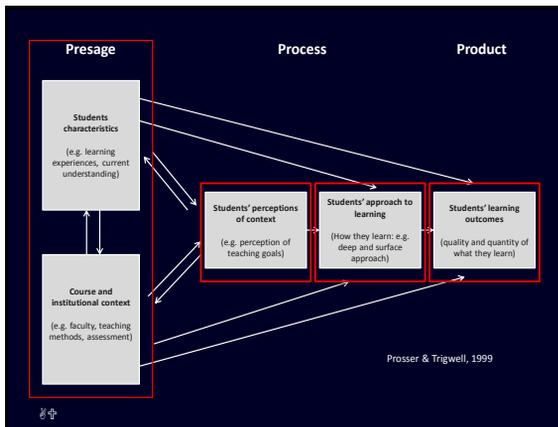
What are the implications

- Surface learning increase the risk of
 - *reproduction*
 - *lack of integration and application*
 - *poor learning results*
 - *Increase in dropouts*
- Deeper learning in contrast prepares students to
 - *know and master core academic content; think critically and solve complex problems;*
 - *work collaboratively*
 - *communicate effectively and able to incorporate feedback.*



From theory to practice – The 3-P model - A model of learning





Measuments of Approaches to Learning



The Study Process Questionnaire (SPQ) (Biggs, 1987; Biggs et al. 2001)

- On the basis of former research on student learning Biggs defined approaches to learning as a composite of a motive and an appropriate strategy.
 - Motives are reasons students have for undertaking a study
 - expressed through a corresponding learning strategy



What is known to influence SAL

Empirical findings



What is known from the literature

Predictors	Deep Approach	Surface Approach
Older age	↑	↓
Gender (female)	↔	↔
Higher Socio-Economic Background (Proxy: Parents' education)	↑	↓
Higher HBC/PA	↑	↓
High school as secondary education	↔	↔
Father had same education	↑	↓
Mother had same education	↑	↓
High intrinsic motivation to study	↑	↓
High external motivation to study	↓	↑
Study level (Master)	↔	↔
Faculty ("hard"/"soft" disciplines)	↓	↑
Faculty ("hard"/"easy" disciplines)	↑	↓
Higher current GPA	↑	↓
Teaching method (seminar or lecture + tutorials)	↑	↓
Teaching method (seminar)	↓	↑
Assessment (longer, written)	↑	↓
Assessment (short, structured)	↓	↑
Importance of teaching environment as promoting Deep Approach	↑	↓
Importance of teaching environment as promoting Surface Approach	↑	↓
Self-efficacy	↓	↑
Test Anxiety	↓	↑

Note: ↑ The predictor is expected to be associated with higher scores on SAL. ↓ The predictor is expected to be associated with lower scores on SAL. ↔ No clear expectation. — The predictor is not expected to show any associations.



General limitations in existing SAL - research

- Small samples
- Lack of multivariate studies: The majority of studies have looked at the relationship between single - or very few - factors and approaches to learning. (Baeten et.al 2010; Richardson et al. 2012)
- Omission of social-cognitive aspects, e.g self-efficacy and test anxiety (Richardson et al. 2012)
- Limited research and knowledge about student learning in Danish higher education



Paper 1 –

Testing the reliability and validity of the Revised Two-Factor Study Process Questionnaire



Paper 1

Aim:

To provide a preliminary test of the reliability and validity of the Study Process Questionnaire in a sample of Danish university students

Methods:

In the pilot phase, the original version of SPQ consisting of 42-items (six subscales) (Biggs, 1987) was translated into Danish using a translation-back translation procedure and tested in a sample of students (N=110)

Results:

Internal consistencies (Cronbach's Alpha) for the six subscales ranged from poor (0.35, Deep motive) to moderate (0.70; Surface strategy),



Paper 1- Methods continued

- Main study: (N= 1083):
- Based on the findings of the pilot phase, the original SPQ was replaced with the R-SPQ-2F (Biggs et. al., 2001)
- The translation was conducted in the same manner as for the original version, as was testing reliability and factor structure using Confirmatory Factor Analysis (CFA) (Biggs et al. 2001) - following the analytical steps described by Biggs et al. (2001)



Results

- Internal consistencies of the Da-R-SPQ-2F subscales (Alpha: 0.80 (DA) - 0.78 (SA)) were higher than those previously reported (0.73 and 0.64) (Biggs et al. 2001)
- CFA suggested moderately acceptable fit at the item level (CFI= 0.815; SRMR=0.07; GFI= 0.874)
- The less than ideal fit was primarily related to the Surface strategy scale.
- A model treating the subscales as indicators of two latent factors (DA and SA), showed better fit (CFI= 0.921; SRMR= 0.05; GFI= 0.952)*
- CONCLUSION: the instrument was suitable for further analysis with the aim of providing preliminary data for Danish university students

*) Goodness of fit indices: Comparative fit index (CFI), Goodness of fit index (GFI), Standardized root mean square residual (SRMR)



Paper 2



Demographic and Contextual predictors of student approaches to learn and in a large sample of Danish university students



Paper 2

Aim: To identify presage factors, i.e. student background characteristics, institutional and contextual variables expected to predict student approaches to learning



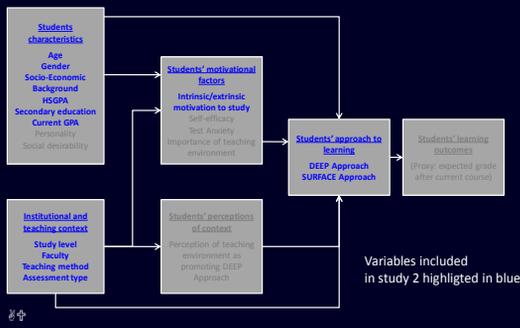
Paper 2- Methods

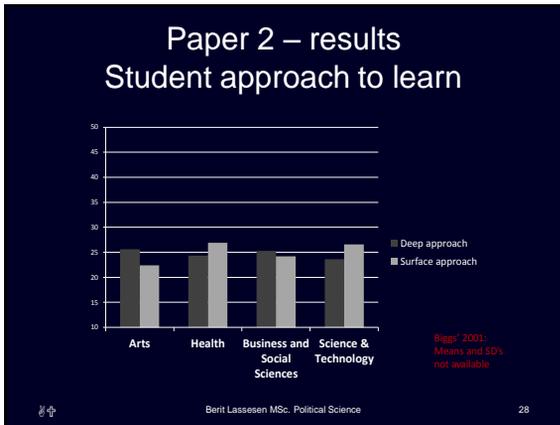
- Aarhus University course catalogues were surveyed for different types of course units, allowing for possible student variation
- and teachers at the four faculties were contacted by e-mail
- A total of 37 classes (range: 3 to 170 participants) were approached approx. half way through the semester (N= 1192)
- The author and two research assistants, all unknown to the students, collected all data



Paper 2 Methods - continued

Presage Process Product





- ### Paper 2- Results Predictors of DA
- Main independent presage factors associated with Deep Approach:
 - Age (old)
 - Gender (female)
 - High school grades (higher)
 - Intrinsic motivation in the choice of study
 - Being a student at faculty of ART or Business & Social Sciences
 - Small group seminar
- Rsq: 0.072
- Berit Lassenen MSc, Political Science 29

- ### Paper 2- Results - Predictors of SA
- Main independent presage factors associated with Surface Approach:
 - Age (Younger)
 - High school grades (low)
 - Being a student at faculty of Health or Science and Technology
 - GPA (low)
 - Lecture as a teaching method
- Rsq: 0.10
- Berit Lassenen MSc, Political Science 30

Paper 2 - Conclusion

- Moderate explanatory power of the suggested model (7-10% of the variation)
- Could indicate that the included variables are insufficient to capture the complex nature of the factors affecting students approach to learn
- Which calls for further search for potential predictors of SAL

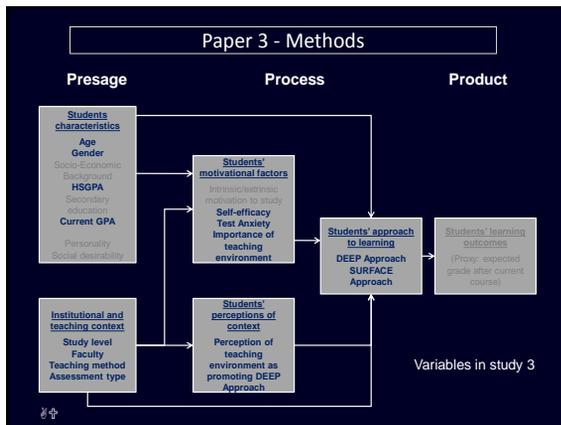
Paper 3

Motivational Factors as predictors of student approach to learning



Paper 3

- Aim: To explore the associations between self-efficacy, test anxiety and students 'approach to learn, while adjusting for other factors known to influence student approaches to learning.
- Methods: All were similar to the one used in paper 2



Paper 3 – Background - Motivational factors

- Three main components:
 - Intrinsic value (the value component),
 - self-efficacy (the expectancy aspect),
 - and test anxiety (the affective component) (e.g. Pintrich and De Groot, 1990; Pintrich 2000).

Bent Lassen MSc, Political Science 35

Paper 3 – Background -Self-Efficacy

Self-efficacy is defined by:

“The belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura, 1995, p.2.)

Self-efficacy influences our behavior:

- through the activities we choose to undertake;
- the goals we set for ourselves
- the amount of effort we expend on a certain activity
- how long we persevere despite confronting obstacles (Bandura, 1997)

Bent Lassen MSc, Political Science 36

Paper 3 – background -Test anxiety

The affective component refers to the emotional aspects of our responses, and are influenced by our goals, values and beliefs (Lazarus & Folkman, 1984)

- The expectancy of success has implications for the student's affective reactions, motivation, and performance
- High expectations of failure may lead to disengagement in the task



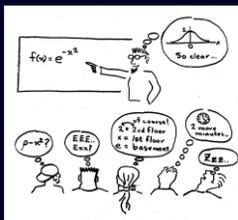
Paper 3 – background- Student perception of the learning environment

Students taking the same courses may vary in their perceptions of the course

This may influence their approaches to studying :

Students who rely on a surface approach prefer a more teacher-regulated learning environment

while students relying on a deep approach enjoy lecturers who challenge and inspire by using activating student-focused methods (Lonka et al., 2008)



Predictors of Student's Approach to Learn (SAL): Expected results based on theory and results of previous studies

PREDICTORS	DEEP APPROACH	SURFACE APPROACH
Older age	↑	↓
Gender (female)	↔	↔
Higher HSGPA	↑	↓
Study level (Master)	↔	↔
Faculty ("Hard"/"Wet" disciplines)	↓	↑
Faculty ("Soft"/"Dry" disciplines)	↑	↓
Higher current GPA	↑	↓
Teaching method (seminar or lecture + seminar)	↑	↓
Teaching method (lecture)	↓	↑
Assessment (Longer, written)	↑	↓
Assessment (Short, structured)	↓	↑
Perception of teaching environment as promoting Deep Approach	↑	↓
Importance of teaching environment as promoting Deep Approach	↑	↓
Self-efficacy	↑	↓
Test Anxiety	↓	↑



Paper 3 - results

- The student motivational factors of *self-efficacy, test-anxiety, and perception and importance of the teaching environment* appeared to be strong* *independent* predictors of SAL, when taking other motivational, background, and institutional factors into consideration
- The inclusion of motivational factors added considerably to the explanatory power of the models (DA : $Rsq = 0.28$) (SA: $Rsq = 0.21$)

*) R² Small: 0.2; Medium: 0.6; Large: 0.10 (Lipsey & Wilson, 2003)



Paper 2 and 3 - Summary of predictor variables

Weak *	Moderate	Strong
Recruitment	Contextual factors	Motivational
age	Humanities and Social Sciences	Higher academic self-Efficacy
gender	Seminars	Lower test anxiety
High School GPA		Perception of the learning environment as promoting deep approaches to learning
Intrinsic motivation to present study		
Mother has same education		

*) Based on the final fully adjusted models: 1) "Weak": Beta's < 0.15; 2) "Moderate": Beta's = 0.15 – 0.20; 3) "Strong": Beta's: > 0.20



Practical implications

- If the goal is to increase the ability to engage in complex thinking and problem-solving (DA), the implications of the findings are:
 - **Age:** If policy-makers want the age, at which students begin a university education lowered – this may influence their learning behaviors in a less desirable direction
 - **Gender:** The proportion of women at the university is increasing – From a learning approach perspective, this does not appear to be a problem
 - **HSGPA:** Despite there may be other reasonable admission criteria - recruiting students with high HSGPA appears to be a reasonable criterion for selecting students



Practical implications

- Intrinsic motivation for the choice of education: Policy-makers wish to direct students to education corresponding to future expected societal needs – *however* – intrinsic motivation is an important factor when it comes to engage in appropriate learning behaviors- Message to students: Choose the study that interests you!
- Faculty: Surface approaches are more prominent in HEALTH and SCIENCE – However, this may not be a problem as hard discipline faculties appear more focused on solving logically structured problems and require more memorization
- Lectures vs. seminars: While costly, small group teaching methods appear to promote DA – and may therefore be cost-effective from a learning perspective



Practical implications

- Concerning academic self-efficacy: Educational institutions should focus on study progression – ensuring successful learning experiences, and process-oriented feedback – Which has been found to promote DA. Avoid lectures followed by brief written exams without detailed qualitative feedback
- Test anxiety: Unrealistic expectations promote TA and SA . Therefore increased detailed transparency in what is required is needed
- Perception of the learning environment: Increasing awareness of the learning goals and how they relate to the teaching activities will promote appropriate learning activities (both DA and SA, when relevant)



Future studies

Studies including:

- Longitudinal designs (avoiding possible cohort effects)
- Experimental designs (intervention studies manipulating independent variables)
- Focus on the more dynamic aspects of learning e.g. self- regulation theories which include planning and monitoring of the learning process would add to our understanding of SAL



Strengths and potential limitations

• Strengths

- To the best of 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
- Addition to the 3-P model - empirical evidence concerning the influence of expectancy and affective components on study behavior has so far been very limited.
- Large sample; Among the weaknesses of several previous studies are the relatively small samples of convenience often used
- The large sample size in our study allowed for using a multivariate approach, enabling comparison of unadjusted associations with results adjusting for the remaining factors investigated



Strengths and potential limitations

• Limitations

- Cross-sectional design (limited causal inference)
- 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.
- Reliability and validity of the Danish version of the SPQ – as it had not previously been used in a Danish context evidence for the reliability and validity of the Danish adaptation is still not fully available
- The exclusion of obtained grades- Only proxy (expected grade) limiting our possibilities for testing the model as a whole
- Between groups vs. within groups - That two students each in a different teaching context are found to have adopted different study approaches does not necessarily imply that if they swapped contexts they would also swap study approaches.



Acknowledgements

- The late Professor Steinar Kvale, Department of Psychology, AU
- PhD, director Torben K. Jensen, Centre for Teaching and Learning, AU
- Professor, MDSci, Robert Zachariae, Department of Psychology, BSS, AU & Aarhus University Hospital
- Professor Klaus Nielsen, PhD, Department of Psychology, BSS, AU
- Teachers and students at AU, who so generously gave their time and participated in this study
- Professor Keith Trigwell and the staff at the Institute for Teaching and Learning, University of Sydney, Australia
- Professor John Biggs, Professor Bill McKeachie, and Professor Kirsti Lonka
- Lisbeth Grønberg and Merete Poulsen
- My wonderful colleagues and friends at Department of Psychology and Behavioural Sciences and Centre for Teaching and Learning, AU
- The administrative staff at Centre for Teaching and Learning and Department of Psychology, BSS, AU
- And last but not least, my family and friends, for travelling with me all the way and surrounding me with love and support - reminding me that there is more to life than work, and yet understanding the times where it had to be prioritized.