

Motivation and Learning Strategies of IS Students: From Theory to Practice

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Abstract

All universities experience students with low motivation, insufficient work effort and low persistence, which lead to low learning outcome and high student dropout. In the bachelor studies in Information Systems at Agder University College (AUC), this has been a problem, with a dropout rate of more than 60%. Knowledge about and actions taken are needed to increase motivation, effort and learning. It is well known that motivation and learning strategies are important for student's learning outcome and student retention. The purpose of this paper is to better understand student motivation and study behaviour in general, and through an action research project investigate how to influence student's awareness of their own motivation and learning strategies. Surveys and interviews will be used to measure motivation and learning strategies among first year bachelor students in Information Systems. Students will be given feedback on their own score and an overview of the score compared to an average in the course. The results from the survey will be the background for interviews and class discussions. The goal of the survey, interviews and discussions is to develop deeper understanding of student motivation and learning strategies.

Keywords: Motivation, self-efficacy, goal orientation, attribution, self-worth and learning strategies

Background

In recent years, most Norwegian universities have experienced several new challenges with more students with low motivation, insufficient work-effort and low persistence. The current generation of students is less used to struggling, and they expect a high level of service. In the bachelor programme in Information Systems at AUC, we have experienced a dropout rate of more than 60% over the three years of study. This indicates that adjustments need to be considered. Pedagogical research has documented that the most important causes of student's learning outcome and student retention are motivation and awareness about and ability to utilize different learning strategies (Weinstein, Husman, & Dierking, 2000). Despite this knowledge, most study pro-

grammes have little focus on mechanisms that foster or hinder motivation, or on learning strategies.

According to a survey carried out among bachelor students in Information Systems at AUC, lack of motivation, a mismatch between expectations of and content in the study programme in addition to ineffective study-strategies were the most important reasons for dropping

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out (Nilsen, 2006). University students are expected to acquire knowledge through what is known as self-regulated learning, i.e. they should be able to organize learning strategies in order to develop knowledge and skills. Research and experience indicate that students are not (well) prepared for self-regulated learning (Zens, 2005). Many students are overwhelmed by the new role as a student, being responsible for their own learning while lecturers and other staff only provide lectures, guidance and support.

Having taught bachelor students in Information systems for more than ten years I find that students today seem less independent, less responsible for their own learning and less inclined to work with difficult tasks over time without getting help. Students act, in a way, like consumers; they sit back and expect somebody to make an effort to give them knowledge. However, students today, as before, have sufficient intelligence, enthusiasm and energy, the challenge is to make the most of these resources in the student. When students join a study programme, they have different experiences, interests, attitudes and beliefs which will influence their own behaviour. Moreover, every university and every lecturer will influence the attitude, beliefs, motivation and enthusiasm of students from day one. One of the most important challenges for universities today is to provide education which will create, maintain and increase motivation and enthusiasm in students and develop the student's own learning strategies.

Motivation and learning strategies are dependent of context. In my experience, students in Information Systems are especially vulnerable for motivation and learning strategies. Study programmes in Information Systems concentrate highly on understanding, utilization of skills in new settings and practical work, either alone or in groups. In programming, for example, students with low motivation and ineffective learning strategies experience vast difficulties. Many courses in an Information Systems program require both persistence and self discipline. Self study and reading only is not sufficient to learn programming, databases or project management e.g. This is the reason why motivation and learning strategies are particularly important and interesting for students in Information Systems.

Some of the things students have to learn - both to be a successful student, and even more for a future job - are how to solve new and unknown tasks; learning-strategies; awareness of the triggers for and killers of motivation, which are all vital elements for their learning outcome. In our programme, a new course "Creative problem solving", which will be taught first time autumn 2007, will focus on these issues. Student motivation and study strategies will be evaluated throughout the semester, and this is where the action research is relevant.

The purpose of this paper is to better understand student motivation and study behaviour in order to develop student's awareness of their own motivation and learning strategies. In order to understand student behaviour we need to know the factors that most influence student performance. Motivation, self-efficacy, goal orientation, attribution, self-worth and learning strategies are constructs that will help clarify student behaviour and performance (Linnenbrink & Pintrich, 2002). The main part of this paper is a literature review of these central constructs in motivation and learning strategy. Implications for practice will then be briefly discussed, concluding with a plan for the implementation of an action research project.

Motivation

The term motivation is often used to describe or explain behaviour. A student who work hard to obtain good grades may be described as being highly motivated, while another student may say that he is finding it hard to be motivated to study or to start an assignment. Such statements imply that motivation has a major influence on our behaviour, but they do not tell us how.

Conceptualization

“To be motivated means to be moved to do something” (Ryan & Deci, 2000, p. 54). People do not only have different degrees of motivation, they also have different kinds of motivation. Level and orientation will vary according to situation. Many contemporary theories of motivation have sought to explain student behaviour: what drives some students to work hard, often over long periods of time and even with little progress, while others give up at the first sign of problems. In new pedagogical research motivation is seen as a dynamic, multifaceted phenomenon; students can be motivated in multiple ways and motivation is contextual. Students should not be labelled motivated or not motivated since motivation may be seen as a function of matter domain, interests and pedagogical framing.

Several views of motivation describe the factors within an individual which initiate, maintain and direct behaviour towards an achievement. In other words: motivation is goal-directed behaviour. Motivation to learn is characterized by long-term, quality involvement in learning and commitment to the process of learning (Ames, 1990).

A literature review of motivation to learn, and factors that influence motivation show that some see motivation only as the wish to learn, while others see motivation as the wish, capabilities and willingness to learn (Palmer, 2005). The same constructs are either seen as part of motivation when capabilities and willingness are parts of motivation, or as factors that influence motivation when only wish is included.

In this paper, I have interpreted motivation as being composed of wish, capabilities and willingness, which implies motivation influence behaviour. Behaviour may lead to what the person wishes, but not necessarily. If a person is motivated to learn for example programming, this person may read and practice, which are signs of motivation. If this person experiences difficulties because of low capability, strong motivation, e.g. strong wish and hard work, may compensate for this. In the following I discuss some specific aspects of motivation.

Intrinsic and Extrinsic Motivation

Self-Determination Theory (Ryan & Deci, 2000) distinguish between different types of motivation based on the different reasons or goals that give rise to an action. The most basic distinction is between intrinsic motivation and extrinsic motivation.

Intrinsic motivation is the tendency to engage in tasks because one finds them interesting and enjoyable. Students with more intrinsic motivation tend to persist at difficult problems and learn from their mistakes (Walker, Greene, & Mansell, 2006). In addition, intrinsic motivation is central for the integration process through which elements of one’s existing internal knowledge is integrated with new knowledge.

Extrinsic motivation is the tendency to engage in tasks because of task-unrelated factors such as the expectation of reward or punishment, for example to pass the exam or get a good grade (Vansteenkiste, Lens, & Deci, 2006).

Intrinsic and extrinsic motivations have been conceptualized and measured as trait-like dispositions. Although a person’s intrinsic and extrinsic motivation vary over situation and time, persons differ in their general tendencies (traits) to be intrinsically and extrinsically motivated across situations and times (Moneta, 2004).

Intrinsic motivation will influence student behaviour in a positive way (Miller, 1988). Students who are intrinsically motivated to perform a task may experience “flow”, a state that may occur if a student through hard work and concentration experience a sense of mastery. Flow is a state of altered consciousness where the ability to concentrate and perform is very much enhanced

(Csikszentmihalyi, 1990). Skills, activity and perceived challenge of the activity are important to achieve flow. Flow may be seen as the ultimate self-regulated learning.

The division into surface and deep learning is another way to describe how students approach learning (Honkimaki, 2004). Students applying a deep approach, try to integrate new information with existing knowledge: focus is on understanding what they are studying. In the surface approach, the student is driven more by an extrinsic motivation, with the aim of mainly passing examinations. A student deploying a surface approach tries typically to memorize details without trying to construct an integrated knowledge base.

Self-Efficacy

Self-efficacy is essential for learning, since self-efficacy and motivation will influence efforts and vigour more than actual ability (Cavaco, Chettiar, & Bates, 2003). Self-efficacy is a persons perception or judgment of own knowledge, capabilities, and capacity, to perform a task at a specified level of performance (Bandura, 1993; Seifert, 2004).

Self-efficacy is domain specific. A student may have high self-efficacy in for example programming but low self-efficacy in an oral presentation. Student judgment of own self-efficacy in a discipline have been found to predict their performance in these disciplines (Glynn, Aultman, & Owens, 2005). Positive self-efficacy for a task will lead to higher goals, more commitment, more effort and persistence. In addition, there is evidence that students with positive self-efficacy beliefs are more likely to continue with even more difficult tasks (Linnenbrink & Pintrich, 2002).

Students with negative self-efficacy and beliefs tend to give up when a task becomes difficult, or just avoid the task (Zimmermann, 2000).

Research has verified that self-efficacy is related positively to most of the factors that contribute positively to learning outcome: persistence, cognitive engagement, use of self-regulatory strategies and actual achievement (Bandura, 1997; Pintrich & Schunk, 2002).

Positive self-efficacy beliefs have positive influence on learning achievement. But even more positive self-efficacy is not necessarily better. What is important is that self-efficacy beliefs are relatively accurate or adjusted to actual accomplishment (Bandura, 1997). Students should neither overestimate nor underestimate their capabilities, they should rather have fairly accurate, but optimistic beliefs about their efficacy to accomplish a task (Linnenbrink & Pintrich, 2002).

When it comes to pedagogical implications, self-efficacy is best facilitated by providing students with an opportunity to succeed. When students work with challenging tasks within their range of competence, preferably towards short term goals, they strengthen their positive self-efficacy beliefs and at the same time develop new capabilities and skills (Glynn, Aultman, & Owens, 2005). Teachers and instructors who give feedback should attempt to foster positive but accurate self-efficacy beliefs.

Achievement Goal Orientation

Achievement goal theory has been one of the most prominent theories within motivation research (Pintrich & Schunk, 2002). The core of achievement goal theory is that students will approach a task with either a performance goal or a mastery goal.

A performance goal student is concerned with own ability and self-esteem, how well they perform relative to others, how others will perceive them and receiving public recognition for their superior performance (Pintrich & De Groot, 1990).

Mastery goal students are task and learning oriented: tasks and assignments are challenges to be overcome. They try to understand their work and to develop new competence.

Achievement goal theories have assumed that a mastery goal orientation lead to motivation and achievement, while the performance goal orientation generates less motivation and less achievement, or even led to maladaptive behaviour and outcomes. These assumptions have been partly supported in a large number of empirical studies on goals and achievement processes (Pintrich & Schunk, 2002). It is proved that mastery goal is related positively to self-regulation and performance (Pintrich & De Groot, 1990). The explanation of these mechanisms is that when students focus on learning and understanding and try to improve own performance, the energy is used to learning and understanding. Failure will only to a low degree influence self-efficacy in negative direction and success will strengthen self-efficacy.

There is not documented a negative link between performance goal and performance or maladaptive behaviour (Pintrich & Schunk, 2002). If students are trying to be the best, trying to achieve higher grades than others it may result in hard work and learning. However, there is a higher possibility that these students will have distracting thoughts like worrying how others are doing or just be anxious of failure, instead of using energy to learn, understand and keep concentrated on the task at hand (Madsen, 2004).

Achievement goal theorists have further developed the performance goal approach by distinguishing between approach- and avoidance-performance goal orientation (Elliott & Harackiewicz, 1996; Middleton & Midgley, 1997). Performance approach goal orientation focuses on trying to outperform others, whereas performance avoidance goal orientation focuses on trying to avoid looking incompetent in comparison to others.

Performance avoidance goals are related to maladaptive behaviour among students. But performance approach goal seems to be related positively to actual performance, at least in term of course grades (Middleton & Midgley, 1997; Skaalvik, 1997). There is an ongoing discussion about the relation between performance approach and academic achievement, whether this link is due to an increase in study skills or engagement, or if it is the social enablers behind the performance approach that lead to academic performance. Many social enablers are tied to achievement goals, e.g. sense of belonging, desire of acceptance by peer students or attempts to achieve social status (Anderman & Anderman, 1999). Sense of belonging and social responsibility is related positively to mastery goal orientation. In contrast, students who focused on building social relationships and achieve social status were more likely to have performance goals (Anderman & Anderman, 1999).

Attribution

An attribution refers to the perceived cause of an outcome. It is a person's explanation of why a particular event turned out as it did. Explanation for failure or a good grade in an exam could be effort, skills, luck or teacher ability. Weiner define attribution in terms of three dimensions (Weiner, 1985):

- Locus of causality: is the cause inside or outside the individual.
- Stability: can the cause change, e.g. illness.
- Controllability: can the individual affect the cause e.g. amount of study.

How students perceive causes in terms of these characteristics will have behavioural consequences (Seifert, 2004; Weiner, 1985). Failure caused by stable factors might lead to expectations of continued failure and feelings of hopelessness. Failure caused by unstable factors might lead to uncertain expectations of future outcome and result in feelings of hope.

- *“Students who explain success and failure to internal, controllable causes are more likely to feel pride, satisfaction, confidence and have a higher sense of self-esteem. As a*

consequence, these students will choose to work on more difficult tasks, persist longer in the face of failure, and produce work that is of higher quality.

- *Students who explain failure to internal, uncontrollable stable factors (inability) are more likely to feel shame and humiliation and will show little effort or cognitive engagement.*
- *Students who explain success to external factors are not going to experience the self-enhancing emotion of pride, satisfaction, confidence or self-esteem” (Seifert, 2004, p. 140).*

Attribution theory is closely connected to self-worth. The explanation of why an event turned out as it did may be a way to protect self-worth.

Self-Worth

Self-worth theory tries to explain motivation as attempts to maintain or enhance self-worth. Self-worth refers to the judgment a person makes about one's sense of worth and dignity as a person. In the mind of failure-avoidant students, performance is a source of self-worth and ability is the source of performance. Often the failure-avoidant student is not able to perform very well (Seifert, 2004). In the absence of actual performance, perceived ability becomes linked to self-worth. Perceived effort becomes important because failure-avoidant students believe that effort is an index of ability.

“Smart people do not have to try hard and people who try hard are not smart” (Seifert, 2004, p. 141).

High effort which results in failure implies low ability leading to feelings of shame and humiliation. According to Covington (1984), given the choice between feeling guilty by not working and feeling shamed by working hard and failing, students would rather feel guilty than feel shamed (Covington, 1984).

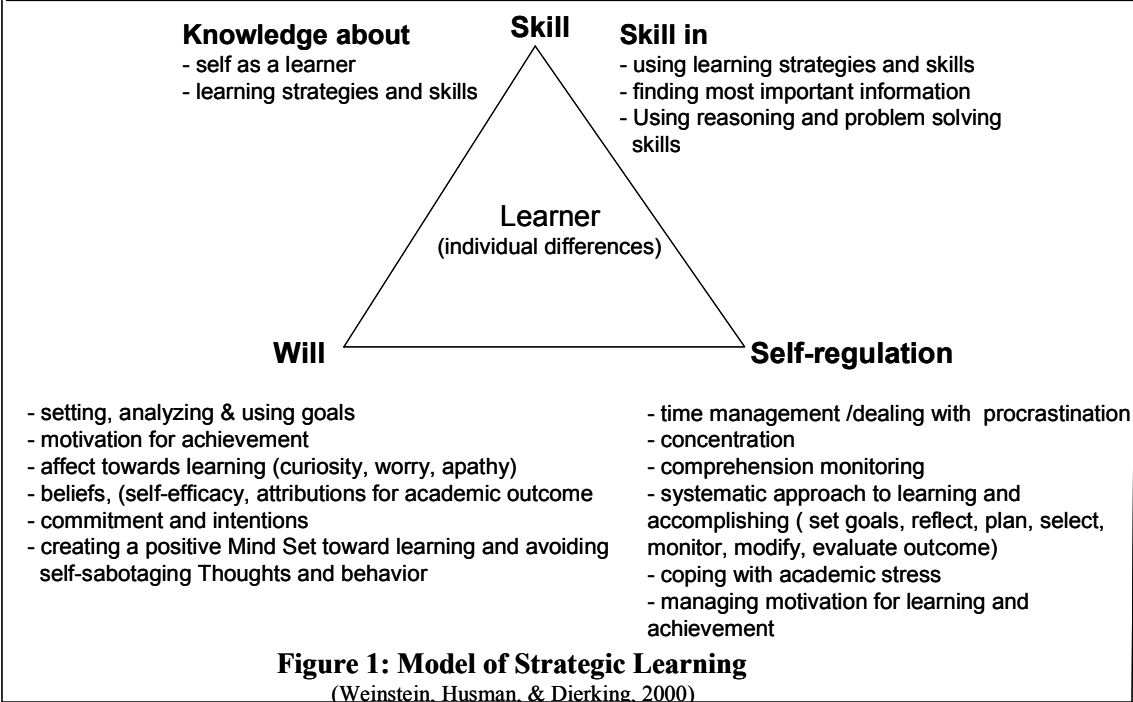
As a consequence, failure-avoidant student may use much energy to protect their self-worth. They may accept failure, but try hard to avoid the implication of failure, namely inability. Defence mechanisms to protect self-worth can be effort withdrawal (not even trying), procrastination, being disorganized, setting goals too high or too low, cheating or asking for help (Seifert, 2004).

By doing this students can explain poor performance other than inability. An open question here is whether students themselves see reasons for failure as an explanation or an excuse? It may be a way to cheat oneself: I did not try, hence I do not know if I have the necessary abilities.

Learning Strategy

Use of learning strategies are heavily influenced by the previous described constructs: motivation, self-efficacy, goal-orientation, attribution and self-worth. Student learning strategies may be broadly defined to include any thoughts, behaviour, beliefs or emotions that facilitate the acquisition, understanding or later transfer of new knowledge and skills (Weinstein, Husman, & Dierking, 2000).

Knowing about and using learning strategies will strongly affect whether a student achieves low results or experience success (Pintrich & De Groot, 1990). Previous research has often focused on one or a subset of variables, for example goal orientation or motivation. Weiner argues that in learning, as in most areas of self-regulation, it is more fruitful to focus on the interaction among varying factors that result in successful learning. Weinstein claims that the factors that most influence student acquisition and use of learning strategies are skill, will and self-regulation (Weinstein, Husman, & Dierking, 2000).



This model (shown in Figure 1) focuses on variables that impact strategic, goal driven learning. The individual, the learner is the core. In every learning situation the learner have a set of variables, including personality, prior knowledge and prior learning experiences. Around this core there are three interacting factors that can influence the degree to which students set and reach learning and achievement goals. The three factors are Skill, Will and Self-Regulation.

Skill, will and self-regulation are personal characteristics, but will vary in different contexts of learning, and student’s learning-strategy will vary depending on the context. Lonka and Lindblom found for example that medical students were more externally regulated and reproduction-directed than students in psychology (Lonka & Lindblom-Ylanne, 1996). One explanation is that courses where achievements in examination are stressed, for example medical studies, will give more externally regulated students with focus on reproduction.

Applying Theory to Practice

Taking pedagogic research seriously implies that universities give more attention to motivation and learning strategies in order to improve self-regulated learning and learning outcome among students. In the bachelor programme in Information Systems at AUC, a new course that focus on motivation and learning strategies is under development. Awareness of the importance of motivation and learning strategies is central. Through this course, students will gain increased insight into their own motivation and learning strategies, and learn how to influence both of them.

Previous learning experiences and perceptions of current learning context affect students’ conceptions of learning and study orientations. For example, if a student has experienced teaching mostly in the reproduction paradigm, the conception of learning will most likely focus on reproduction. In contrast, if a student has been exposed to teaching and studying which focus on thinking and deep understanding, it is more likely that this student will study with a focus on understanding and construction of knowledge. This is the reason why insight of own motivation and learning strategy is so important. The goal is to make students aware of the mechanisms that di-

rect their own studying and learning. This consciousness is necessary to develop learning strategies and self-regulated learning.

Based on research, literature and experience, several components seem to be needed in a course where learning-to-learn is adjunct to a course. Learning skill courses are most successful when they are taught in context (Hattie, Biggs, & Purdie, 1996). When developing our study programme, the following should be taken into consideration:

- Give students opportunities to practice different learning strategies.
- Encourage students to actively seek and organize information into a format that is meaningful to themselves, this includes tagging of information as relevant or irrelevant (Weinstein, Husman, & Dierking, 2000).
- Use interactive and collaborative methods in order to decrease problems with motivation and decrease the reproductive orientation (Honkimaki, 2004).
- Use activities that focus on autonomy and relatedness to foster intrinsic motivation.
- Give students challenging tasks and opportunity to succeed.

In studies among university students (Honkimaki, 2004; Vermunt, 1998), it was identified four different learning strategies or learning styles among students:

1. *“Undirected students cannot see the difference between essential and unessential things but regard everything as having similar importance. They cannot construct an integrated knowledge base or see connections between studies and life. The self-regulation of undirected students is centred on their study problems. They think that studying is difficult, and they are afraid of failing in their studies.*
2. *Reproduction-directed students consider learning as a transfer of knowledge, and aim at memorizing and reproducing knowledge as such in examinations. They are usually externally regulated: their teacher's advice and hints are important to them.*
3. *Meaning-directed students concentrate on the things they feel important and interesting. They aim at understanding and constructing meanings and do not cling to details. They also try to connect new with previously learnt information and to construct an integrated whole. Typically, they are internally directed in learning.*
4. *Application-directed students seek for connections between studies and practice, and try to make the things they are studying more concrete. When studying new content they try to make these connections by using their own experiences and everyday events as examples. They consider they have learnt when they can put things into practice”*(Honkimaki, 2004, p. 434)

Through every course in the bachelor programme in Information systems, and especially the course in Creative Problem solving, the goal is to move category 1 and 2 students to category 3 and 4.

New Course: Creative Problem Solving

The new 10 credit course is an expansion of a 5 credit course in communication and cooperation. The new topics that will be covered are: problem solving, especially where knowledge and experience are low; learning strategies - making students aware of their own learning strategies and give a repository of the same, both in theory and practice; killers and enablers for motivation; attribution and goal-orientation.

Students vary in competence, motivation and learning strategies. A challenging task to one student may be boring or impossible to solve for another. To give challenges on the right level and appropriate guidance/help is crucial to develop self-regulated learning. Table 1 shows how students tend to react on combinations of skills and challenge:

Table 1: Students skill, challenge and reaction.	
Situation	Effect: Person tend to experience
Skills and challenges are low	- apathy, quality of experience is lowest.
Challenges are greater than skills	- anxiety, quality of experience is higher than in apathy
Skills are greater than challenges	- boredom, quality of experience is higher than in apathy
Challenges and skills are high	- self-regulated learning, quality of experience is highest

In order to increase self-regulated learning, two things are especially important:

- Provide challenges according to skills.
- Learn students to handle challenges when skills are low.

Over the last years, much attention has been given to motivation and challenges in our study programme. First semester bachelor in Information systems consist of three courses: Introduction to Information Systems; User Interface and Creative Problem Solving. One of the main goals in the Creative Problem Solving course is to teach student to do tasks they have few qualifications to handle.

In the Introduction to Information Systems course assignments constitutes 50% of the grade. By letting students themselves decide the level of their own individual assignment there is a better balance between skills and challenges. For example, one assignment was to develop a web site using php and MySQL. Some students were experienced, while others had no knowledge of these tools. Students reported they learned very much; I observed that students were highly motivated, they worked hard, and they learned a lot.

Measuring Motivation and Learning Strategy

The importance of motivation and learning strategies for learning outcome and retention is well documented (Ames, 1990; Linnenbrink & Pintrich, 2002). Through a longitudinal action research project the aim is to obtain a deeper understanding of how motivation and learning strategies can be influenced and developed in a bachelor study programme in Information Systems.

As part of the Creative Problem Solving course, motivation and learning-strategy will be monitored through surveys and interviews also in the two other courses students have, "Information Systems" and "User Interface". Results from these surveys and interviews will give valuable input to development of student awareness of own motivation and learning-strategy and will also be used further to develop not only these courses but also the whole bachelor programme.

To assess motivation of students, the Motivated Strategies for Learning Questionnaire, (MSLQ), will be used. It is a widely used instrument for investigating motivation and learning strategies (Chen, 2002; Pintrich, Smith, Garcia, & McKeachie, 1991). The instrument has been under development since 1986, and was initially developed at the National Center for Research to Improve Postsecondary Teaching and Learning at the University of Michigan. MSLQ consists of one motivational- and one learning strategy- section and is developed for use in a specific course, since motivation and learning strategies are context specific.

The questionnaire consists of 81 items, see appendix 1. For each of the 81 items in the questionnaire students rate themselves on a 7 point Likert scale from 1: “Not true at all for me” to 7: “Very true to me”. Some of the 81 items are negatively worded, in appendix 1 these are denoted with (REVERSED) after the statement. Ratings of the negatively worded are adjusted before computation of the scores. The 81 items give value to 15 scales: six on motivation and nine on learning strategies. Scale scores are constructed by taking the mean of the items that make up that scale. Table 2 shows the six scales for motivation and nine scales for learning strategies:

Table 2: The MSLQ scales for motivation and learning strategies	
Motivation scales	
Intrinsic motivation	Extrinsic motivation
Task Value	Control of Learning Beliefs
Self-Efficacy for Learning and Performance	Test Anxiety
Learning strategies scales	
Rehearsal	Elaboration
Organization	Critical Thinking
Metacognitive Self-Regulation	Time and Study Environment Management
Effort Regulation	Peer Learning
Help Seeking	

See the Appendix for items on each of the 15 scales. In addition to statistical data from the survey, interviews will be used throughout this project. The interviews will be based on response from the survey to get more elaborate information in addition to the statistics.

Since the interviews are based on actual answers from students, they can give valuable input to a deeper understanding of motivation and learning, both to the research project and to the student.

To delimit access to the survey, students need an access code to be able to register. They then register an ID, password, sex, age, study experience and work experience. The best would be to have the survey anonymous, but since interviews are based on the survey response, it can not be. It will be mandatory to answer the survey for all three courses, “Creative Problem Solving”, “Information Systems” and “User Interface”, during September and October. To keep control, students have to use e-mail as ID. Since one of the goals of this project is to make students aware of own motivation and learning strategies, students can at any time log in and see their own data and compare with the class average. Results from the surveys and interviews will be used in class discussions in the Creative Problem Solving course.

Each of the 70 students in the first year bachelor programme will be interviewed. Focus in this talk will be on motivation, study progress, learning strategies and well-being.

Hopefully, findings and experience from this project will influence positively the participating student’s motivation, learning strategy and learning outcome, and also give valuable input to further work and concentration on these constructs, both among students and faculty. Knowledge of motivation and learning strategies in itself may be even more valuable for students than the improved grades it may cause.

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Appendix: Questions in the Motivated Strategies for Learning Questionnaire (MSLQ)

Part A: Motivation

Intrinsic motivation:

- In a class like this, I prefer course material that really challenges me so I can learn new things.
- In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.
- The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.
- When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.

Extrinsic motivation:

- Getting a good grade in this class is the most satisfying thing for me right now.
- The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.
- If I can, I want to get better grades in this class than most of the other students.
- I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.

Task value:

- I think I will be able to use what I learn in this course in other courses.
- It is important for me to learn the course material in this class.
- I am very interested in the content area of this course.
- I think the course material in this class is useful for me to learn.
- I like the subject matter of this course.
- Understanding the subject matter of this course is very important to me.

Control of learning beliefs:

- If I study in appropriate ways, then I will be able to learn the material in this course.
- It is my own fault if I don't learn the material in this course.
- If I try hard enough, then I will understand the course material.
- If I don't understand the course material, it is because I didn't try hard enough.

Self-Efficacy for learning and Performance:

- I believe I will receive an excellent grade in this class.
- I'm certain I can understand the most difficult material presented in the readings for this course.
- I'm confident I can learn the basic concepts taught in this course.
- I'm confident I can understand the most complex material presented by the instructor in this course.
- I'm confident I can do an excellent job on the assignments and tests in this course.
- I expect to do well in this class.
- I'm certain I can master the skills being taught in this class.
- Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.

Test Anxiety:

- When I take a test I think about how poorly I am doing compared with other students.
- When I take a test I think about items on other parts of the test I can't answer.
- When I take tests I think of the consequences of failing.
- I have an uneasy, upset feeling when I take an exam.
- I feel my heart beating fast when I take an exam.

Part B: Learning Strategies

Rehearsal:

- When I study for this class, I practice saying the material to myself over and over.
- When studying for this course, I read my class notes and the course readings over and over again.
- I memorize key words to remind me of important concepts in this class.
- I make lists of important items for this course and memorize the lists.

Elaboration:

- When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.
- I try to relate ideas in this subject to those in other courses whenever possible.
- When reading for this class, I try to relate the material to what I already know.

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- When I study for this course, I write brief summaries of the main ideas from the readings and my class notes.
- I try to understand the material in this class by making connections between the readings and the concepts from the lectures.
- I try to apply ideas from course readings in other class activities such as lecture and discussion.

Organization:

- When I study the readings for this course, I outline the material to help me organize my thoughts.
- When I study for this course, I go through the readings and my class notes and try to find the most important ideas.
- I make simple charts, diagrams, or tables to help me organize course material.
- When I study for this course, I go over my class notes and make an outline of important concepts.

Critical Thinking:

- I often find myself questioning things I hear or read in this course to decide if I find them convincing.
- When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.
- I treat the course material as a starting point and try to develop my own ideas about it.
- I try to play around with ideas of my own related to what I am learning in this course.
- Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.

Metacognitive Self-Regulation:

- During class time I often miss important points because I'm thinking of other things.
(REVERSED)
- When reading for this course, I make up questions to help focus my reading.
- When I become confused about something I'm reading for this class, I go back and try to figure it out.
- If course readings are difficult to understand, I change the way I read the material.
- Before I study new course material thoroughly, I often skim it to see how it is organized.
- I ask myself questions to make sure I understand the material I have been studying in this class.
- I try to change the way I study in order to fit the course requirements and the instructor's teaching style.
- I often find that I have been reading for this class but don't know what it was all about.
(REVERSED)
- I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.
- When studying for this course I try to determine which concepts I don't understand well.
- When I study for this class, I set goals for myself in order to direct my activities in each study period.
- If I get confused taking notes in class, I make sure I sort it out afterwards.

Time and Study Environment Management:

- I usually study in a place where I can concentrate on my course work.

- I make good use of my study time for this course.
- I find it hard to stick to a study schedule. (REVERSED)
- I have a regular place set aside for studying.
- I make sure that I keep up with the weekly readings and assignments for this course.
- I attend this class regularly.
- I often find that I don't spend very much time on this course because of other activities. (REVERSED)
- I rarely find time to review my notes or readings before an exam. (REVERSED)

Effort Regulation:

- I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.(REVERSED)
- I work hard to do well in this class even if I don't like what we are doing.
- When course work is difficult, I either give up or only study the easy parts. (REVERSED)
- Even when course materials are dull and uninteresting, I manage to keep working until I finish.

Peer Learning:

- When studying for this course, I often try to explain the material to a classmate or friend.
- I try to work with other students from this class to complete the course assignments.
- When studying for this course, I often set aside time to discuss course material with a group of students from the class.

Help Seeking:

- Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone. (REVERSED)
- I ask the instructor to clarify concepts I don't understand well.
- When I can't understand the material in this course, I ask another student in this class for help.
- I try to identify students in this class whom I can ask for help if necessary.

Biography



Hallgeir Nilsen is Associate Professor at Agder University College. He is Cand. Scient. in Information Systems from the University of Oslo. For ten years he worked with system development, from 1987 till 1997. In this period he was employed by the municipality of Oslo, Andersen Consulting ANS, and Allianse Informasjonssystemer. In 1997 Hallgeir started working at Agder University College. His research interests are implementation and use of ICT in public sector, end-user-training, and how to teach information systems.