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Students Study Results, A Question of Styles, Strategies,

or (mis) Matching?

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Abstract

The purpose of this study is to gain a better understanding of the factors that influence students' academic performance. The background to the study is the transition from elite to mass education in universities. The study is based on the academic performance among 21 students during the first year of a teacher education in Sweden. Based on academic performance, the study examines what distinguishes a high-performing, middle and a low-performing group with respect to learning styles preferences and approaches to learning. Using descriptive statistics and phenomenographic methodology, the study shows that those who are most successful use deep strategies and have auditory / visual dominant perceptual preferences. The low-achievers use surface strategies, have tactile or kinesthetic perceptual dominance and display a lack of confidence in their studies as a result of the earlier failure. The conclusion is that the study results depend on students' learning styles and strategies but

it is also a question of how well the university education can meet all students. This article discusses how the results can be explained and why it may be of interest to today´s university education and teacher education.

Keywords: learning styles, learning strategies, matching, phenomenography

1. Introduction

Changes from elite to mass education in our universities are facing several challenges in terms of pedagogy (Krebs, 2007; Leidman, 2011), involving changes in traditional approaches to teaching and assessment practices as *"... that not only 'all' get admitted into our programs, but "all" also have a fair chance to succeed* (Krebs, p 3). " Mass education means that students with a greater variety of learning styles preferences, socio-economic backgrounds and with different physical / mental special needs begin university studies compared to previous[i]. Particularly during the first study year, it is necessary for many students to change their study strategies to cope with university studies. The requirements are often perceived as harder than before, there is less teacher-led instruction and at a distance studies students are, in addition, during loading periods, wholly directed to fend for themselves. Additionally, there is some bias concerning social groups and study traditions (Högskoleverket, 2007; Svensson, 2011) in Sweden. An indication that the student´s individual approach to learning is important, both for the individual student and the university, is the broad focus on different courses in study techniques.

Both international (McKinsey, 2007; Cavas, 2010) and Swedish (SOU 2009/10: 89) research shows that teachers' competence is crucial for students' academic achievement. However, it is likely that teaching methods in general, at university level, are mainly adapted to the student groups that already have good knowledge and study habits. For this group good study results are self-evident, while quality developments for the ”low achieving” students are much more uncertain.

If the learning environment supports and promotes excellence in teaching, good results could be achieved. Teacher education is under review in Sweden and the most recent education bill (SOU, 2009) points out that *“education and skills of teachers are among the most important factors in ensuring a successful school system”* (p 5). Students are different and so are teachers; but how much do teachers know about the student group they encounter? What distinguishes one student group from another in the best way to learn; so-called learning style? And how can teachers match, i.e. adapt the organization of teaching, to the different student groups, in the best way possible?

Most students are likely to develop and change their approaches to learning based on the changing demands they encounter. They adapt quite easily to various harsh environments. However, there is no unambiguous research on how, when and why changes occur (Evans & Kozhevnikov, 2011; Dunn & Griggs, 2007). What a student learns and how the learning process develops, becomes at worst from the student perspective, a secondary issue in relation to getting a good score on the topic and / or course. Student performance on exams can give clear indications of whether and how to develop skills and approaches to learning. Either students learn what is expected and develop / change their study strategies, or they remain at the same level. At worst, they drop-out, even though the capability exists.

Research shows that there is a knowledge gap regarding how students develop and change approaches to learning based on the demands they face. Mass education at university level involves a greater diversity of students with different cognitive abilities and learning styles.

An awareness of how students process knowledge and the study results that ensue, can increase the insights of both students and teachers into the teaching environment and can be adapted to different types of student groups or individuals (Evans, Cool & Charlesworth, 2010).

2. Background

Internationally, there is emerging research on patterns of student learning, relationships between learning styles, approaches to learning, concept formation and knowledge. Many see Marton and Säljö (1976, 1984) research on surface and deep learning, as the starting point and groundbreaking for research (e.g. Vermunt & Vermetten, 2004, Evans et al. 2010). Furthermore, there is obvious confusion and overlap within the approaches to learning, cognition research and learning styles. This will be described in brief in the following section.

2.1 What is Learning Styles?

Learning styles can be defined in different ways depending on the focus of the learning process, but in general it is about how people learn in an individual way and what is important for learning to flow naturally (Cools & Rayner, 2009). Learning styles may include more than 70 different models with conflicting assumptions about learning, and with different designs and points (Coffield, Ecclestone, Hall & Moseley, 2004). There are many different theories and models of learning styles with varying dimensions and variables. They focus on different aspects: cognitive processes, skills, sensory modalities, learning process, thinking styles and so on. In Scandinavia, the two most known and used models are Kolbs Learning Styles Model, which describes the process of information and is frequently used as a starting point in problem-based learning (Hard af Segerstad, Klasson & Tebelius, 1996), and Dunn and Dunns Learning Styles Model, which is multidimensional and is widely used in both child and adolescent education as well as in adult education (Bostrom & Lassen, 2006; Lauridsen, 2007).

2.2 The Dunn and Dunn Learning Styles Model

Dunn and Dunn Learning Styles Model focuses on the factors that determine when we learn difficult and new knowledge. Learning styles preferences[ii] [iii]is a combination of both biological and social determined patterns. Style features vary depending on academic achievement, gender, age, culture, and information processing.

There are twenty different factors that are objective and have measurable impact on learning (Dunn & Griggs, 2007). These twenty factors have been demonstrated to a statistically predictable significance at the 95% level. For students, it is very important to be aware of the influences such as motivation, concentration and retention and then to match these with the requirements of the learning environment sets. Dunns´ Model has been examined from many different aspects, different types of schools, ages, subjects and populations. Many studies have focused on whether learning styles pedagogy affects performance, memory retention, attitudes and behaviors. Others have focused on meta-learning and school improvement. Research has shown that students [iv]who do well in school, so-called "high-achievers" have more dominant visual and auditory perceptual preferences, prefer learning alone, has great

need of a teacher, need silence, formal design and bright lights; while the so-called "low achievers" have tactile or kinesthetic dominant senses, need noise, informal design and soft lights (Dunn & Griggs, 2007).

2.3 What are Approaches to Learning?

The original work on approaches to learning and knowledge comprehension was conducted by Marton and Säljö (1976) and results were presented in the two approaches; surface and deep learning. The former is about remembering facts in a knowledge-content and focuses on what students believe will be assessed later, a so-called atomistic approach. It leads to more retention of factual knowledge and less understanding or a long-term conservation depth of knowledge. The latter involves a holistic approach in which students try to understand the big picture and then use this understanding in real life. It promotes understanding and application of knowledge in life. Surface learning students want to perform according to what the course and teachers expects, and are motivated primarily by fear of failure. Many students have become accustomed to this approach in previous studies and expect the same learning environment at university level. Deep learning is probably experienced by many students during the first term in college as an unattainable goal if teaching is based on ambitious lectures and exercises / seminars while the examination forms are traditional and check facts. It is not unusual that most first year students feel that they have difficulties coping with their studies. To quote Vermunt: .

One remark about undirected learning should be made here. Although different studies show very consistently that, in the long run, undirected learning is negatively related to study success, a (short) period of rather undirected learning may be a necessary phase for change and development in students' for learning patterns to occur. A period of friction is therefore experienced in which they are dissatisfied with their old way of learning and experiment with new strategies. (Vermunt, 2009, p.176)

It is important to emphasize in this context that these characteristics are not attributes of individuals, and that both strategies can be used by a related person to a different extent and that they can be linked to internal and external motivation. In addition, students using surface strategies reach certain learning objectives in courses.

The concept of approaches to learning can be used in several other ways. Learning strategies can be defined as the unconscious or conscious choices the learner or the teacher make (Kroksmark, 2003), spontaneous choices, learned or a consciously chosen pattern (Hellertz, 1999) or direct and indirect strategies (Oxford, 1990). Tornberg (2000) uses the concept of learning strategies and emphasize that they have an intermediary role, because she found that students' prior knowledge, their learning styles and the tasks to be solved, affect their strategic choices.

The concept of learning strategies also occurs in sport psychology, organizational theory, working research and in Human Resource Management (HRM). Dunn´s defined learning strategies that *"... the methods through which teachers teach and / or learners learn**;** CAPS,*[v] *PLSs, MIPs, tactual Resources and kinesthetic approach"* (Dunn, 2003). Thus, the concept of

this theory is linked to practice and therefore provide a concretization of the individual approaches to learning.

Closely related to learning strategies is the concept of *learning approaches,* (Vermunt, 2009) and *disposition for learning* (Entwistle & McCune, 2004), which emphasizes both the use of surface, deep or strategic approach to learning, and self-regulation, motivation, and emotional aspects. Four patterns with strong correlation between the behavior, skills, values and motivation emerges, and these patterns are called unfocused, reproducing, understanding-oriented and vocational (Vermunt, 2009).

With this expanded vision of approaches to learning the question is raised as to whether students use different approaches to learning depending on discipline, personal interests and career choices. Parpala, Lindblom-Ylänne, Komulainen, Litmanen & Hirsto (2010) show in a comprehensive study of university students that learning strategies and discipline distinguishes itself markedly in ten different disciplines. Further influencing aspects of students' approaches to learning in addition to personal interest and career choices (Mikkonen, Heikkila, Rouhoniemi & Lindblom-Ylänne, 2009), are teaching strategies, workload of courses and curriculum (Rouhoniemi & Lindblom-Ylänne, 2009). The question of whether and learning styles preferences and different teaching methods can predict performance is also a research question in this context and is answered affirmative doubtful by Gurpinar, Alimoglu, Mamakli, and Aktekin, (2010) concerning students in medical school.

In conclusion, the concept learning approaches are multifaceted can accommodate different perspectives concerning the learning process and can be viewed from different perspectives. The following text describes our summarized view of the relation between the learning styles concepts (Figure 1).

It is obvious that students bring their prior knowledge and leaning styles traits with them. These factors are used and developed as conscious or unconscious strategies in a learning context / learning environment, and is found in the quality of the learning and academic performance, with understanding that can be surface and / or deep focus.

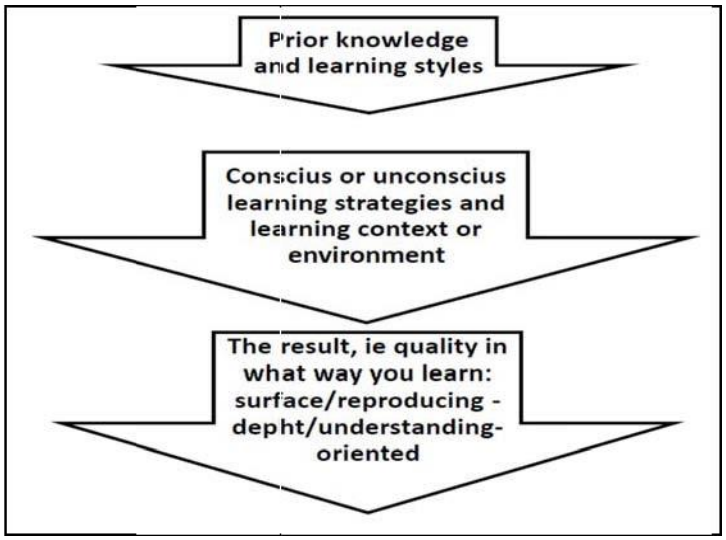

Figure 1. Possible relationship between learning strategies concepts

It is important to emphasize that learning context and / or learning environment involve possible "external" influences on the student. First of all, we imagine that a key factor is how the lessons are organized with lectures, seminars and examinations. Furthermore, it is obvious that the private life of the student involving friends, family, etc. should not be underestimated as influences when students choose different approaches to learning. If it should turn out that students are finding it hard to develop their study strategies from the unconscious and reproduction to more advanced, we see this therefore, as an open question as to how this could be explained and understood. Each new student carries his "backpack" of past experiences and strategies into the new context which needs to be adapted. Finally, approaches to learning appear in the study results and the quality of how to learn. It should be noted that the three levels of approaches to learning overlap and have an impact on each other, but the scale and relationships remain to be studied.

3. Purpose and method

The aim of this study is to describe the learning styles preferences and learning strategies of 21 students based on their academic performance during the first year at X- University. These questions are as follows:

What is the relationship like between good and poor academic performance and learning styles preferences and learning strategies?

What are the students´ beliefs/opinions about the relationship concerning learning, learning environment, their own learning styles and learning strategies?

3.1 Population and Data Collection

The study is based on the study results after the first year and is based on two different empirical materials; the learning styles assessment Productivity Environmental Preference Survey (PEPS) (Dunn, Dunn & Price, 1984, 1991, 2000; Price, 2001) and written

assignments in the course study skills (3 credits). To find the learning styles preferences we used PEPS and to gain insight into learning strategies of the subjects, their own words were analyzed in the assignment. To fulfill the purpose and answer research questions, a compilation and comparison of the empirical material with both qualitative and quantitative analysis was carried out. The study included 21 students on the teacher training program (three men and 18 women[vi]), aged 19-48 years. Data was collected during the years 2010-2011.

The focus of the questions in the learning styles assessment was what the respondents considered to be important, when learning difficult and new information. The test consists of 100 claims in five gradations. Students' grade statements on a 5-point scale from 1 (definitely disagree) to 5 (definitely agree with. The PEPS-test is a useful tool for valid conclusions about learning styles (Dunn, Griggs, Olson, Gorman & Beasley, 1995; Nelson, Dunn, Griggs, Primavera, Fitzpatrick, Bacilious & Miller, 1993). Response data was treated to obtain an individual mean of the 20 learning styles preferences. The individual profile shows an average for each question on a 60-point scale in the areas of low (averaging 20-40), flexible (average 40-60) and high (mean 60-80). The mean value for each individual preference was then used to obtain the group average. These then form the basis for analysis in the studies.

The purpose of the assignments in the study technique course was *"... by your writing and reflecting, from what you **experienced** during the course with learning styles assessment, exercises, etc., and from **the literature** in order to gain a better insight into your personal learning styles and demonstrate an understanding of university studies conditions."* (Studiehandledning p.5). In other words, it was a fairly free exercise to link their learning to the literature on study skills and insights about their own experiences as to what has worked / not worked and what they have found useful, etc. These assignments have been analyzed using the phenomenongraphical method (see below).

3.2 Phenomenographic Approach

Analyses of the student assignments were based on a phenomenographic research approach to understand some of the background into their accomplishments. Phenomenographic research presents views and describes differences in individuals' perceptions (Alexandersson, 1994). The researcher searches for meanings rather than frequencies, connections or explanations. Phenomenography is a description of these differences, thus the variation in perceptions. The researcher has to take a step back and not rely on his/her own experience of the world, but rather understand the phenomenon from a different person's perspective (Marton & Booth, 2000) and to explain how the world is experienced in qualitatively different ways by different people.

The goal is to try to observe a hypothetical range of human understanding of the phenomena. Its premise is that people have different perceptions of phenomena (Alexandersson, 1994). These differences depend on the fact that different people have different experiences because of their different outlook on the world. This study used description categories to collect statements that show views of the investigated phenomenon and defines and describes those having a similar meaning. These are then analysed in relation to academic performance and

learning styles preferences.

In order to analyze and interpret the writing assignments, we used Alexandersson´s (1994) four phases for the analysis of a phenomenographic study. These are: to familiarize yourself with the data and create an overall impression, pay attention to the similarities and differences, categorize perceptions of the description categories and possibly to study the underlying structure of the category system. The sample space is the main result (Alexandersson, 1994). There is also a basis for a more systematic analysis of how perceptions relate to each other. In this analysis, the perceptions frequencies interrelated and created a category system. In the category system the categories were equal; therefore no category was more important than the other. In other words, they could not be ranked. Some ideas can also be seen to be more developed and comprehensive than others, but this was not the case in this survey.

3.3 Ethical Considerations

Ethical considerations were respected during the research process. Research Council's ethical norms were followed in the study regarding individual protection of information, consent, confidentiality and use. The subjects were asked to consent to the study and information was given about its purpose and methods of procedure and possible future use of research materials. All the subjects participated voluntarily in the study after a presentation of the study and assurance of anonymity. Each individual is guaranteed anonymity through encoding. The findings are therefore not linked to the individual.

4. Results and analysis

The results chapter first presents the links that emerge between students' learning styles, their study strategies and their academic performance and the differences between the various student groups. It goes on to describes the types of approaches to learning that students developed during the first term.

4.1 Results Groups

After the first term, three groups was identified namely those that performed the least on the exams (the low achievers), an intermediate group and those who performed best (high achievers). The results are, in statistical terms, the dependent variable and the learning styles preferences and study strategies are the independent variables. The pattern that emerged in the study is described below.

4.1.1 The Low Achievers

Students in the low performing group had the most tactile and / or kinesthetic learning styles preferences, which means that they learn best through so-called hands-on learning or learning by doing and two students showed auditory strong preferences. In addition, all displayed the needs of high structure in their learning. In this group we find the largest number of students in the group surface learning and none have described any kind of deep learning. Two of the students did not express anything about the surface or deep learning. What is also evident for this student group is that four of them have written about past experiences of school in negative terms, which affected their self-esteem regarding university studies. Three of them

have described active learning strategies and have some goals in sight for the future.

4.1.2 The Intermediate Group

The intermediate group consists of mainly auditory students, of which two, apply both strategies (deep and surface learning), three apply surface learning, and two students could not be described in this regard. Four of them use active approaches to learning and five have long or short-term goals. Two of the students describe the experience and impact on their academic performance. One student stands out with a low visual preference but seems to have compensated for this with deep strategies, active approaches to learning and goals. All but one needs high structure in their learning.

4.1.3 The High Achievers

In this group we find students with one or more strong perceptual preferences, auditory in combination with something else. Five students display deep learning and have two descriptions of surface learning. Only four of them, need high structure, displaying a self-confidence that affects the studies, no mention of past experience however. Six of the seven students account for active learning strategies, and five have goals in sight. A distinguishing fact in this group is a student with strong tactile sense but with a deep understanding, active learning strategies and goal-oriented thinking.

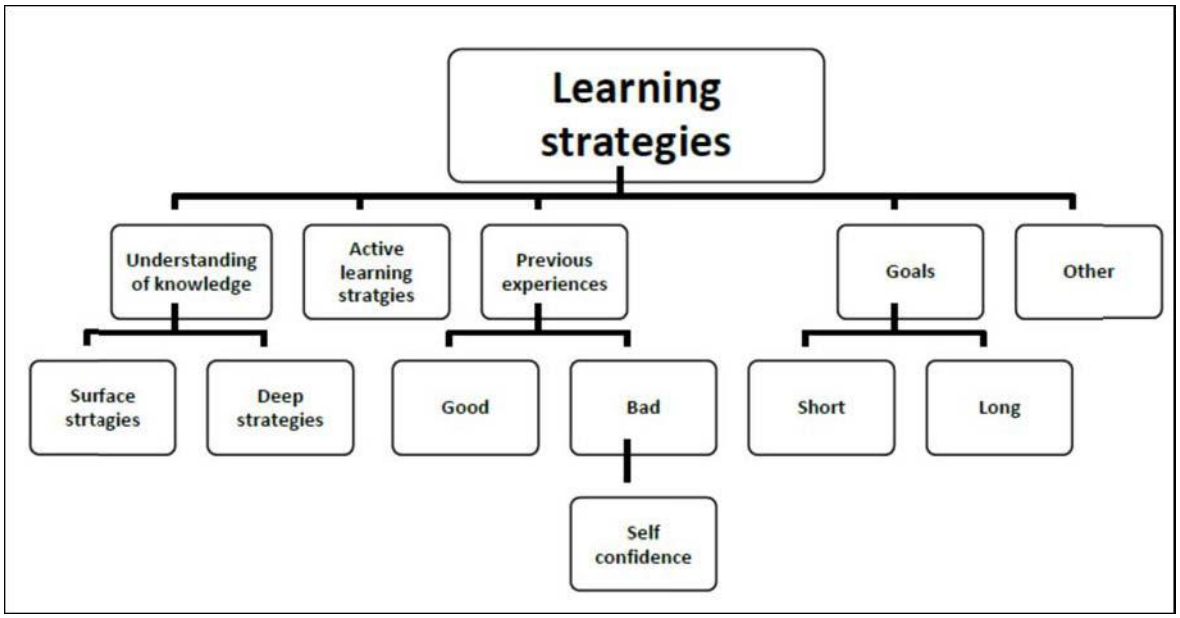

Figure 2. Students' descriptions of important approaches to learning

4.2 Important Learning Strategies

The results of the phenomenographic sub study are discussed here. The contents include the informants´ descriptions of their learning strategies in a broad sense. Their testimonies resulted in five different categories of description (see Figure 2) that all deal with this subject but are qualitatively different from each other. The first category deals with the description of

knowledge understanding described in the two subgroups of surface and deep learning. The second describes the different types of active approaches to learning such as annotation techniques, reading strategies, structuring principles, etc. The third category deals with description of past experience which distinguishes the good and bad experiences. The latter leads in many cases to an impacted negative confidence. The fourth group is summarised in this case, which can be short and long term. The last description category is broad and undefined, hence the description, moreover, in which students can refer to dysfunctions, study group influence, etc. Below is an overall diagram of the result. The result is a horizontal system and the figure should be read accordingly.

4.3 Knowledge Understanding

Regarding the understanding of knowledge, the two main approaches to surface and deep learning are inferred from their descriptions. Those students who used surface learning describe how they try to remember what was in the text or what the teachers said in the lectures. The focus is on reproduction or reproducing the contents.

.... Then go back and remember through my notes, I get a better foundation for my different assessment tasks (Lena 1).

Another aspect of surface learning is a kind of instrumental approach to content and data, to be ready and try to "check off" content. The following quotations may represent this strategy.

Good when we have exams so that we can put that work behind us. It makes it feel like you can check off parts from the great mass of literature and the work to be done. (Lena 13)

Another obvious feature is a quantitative focus rather than a qualitative. This is a student's description;

Right now I have to select all the books. I put them up and see what has to be read, then I put some posters between to see how much I have to read every day. (Lena 7)

Some of the students use a combination of both surface strategies and deep strategies. They present uncertainty by shifting between finding the "right knowledge and thinking" and self-reflection.

I have also tried to summarize what I read and go back to my notes while I read. I have tried to develop the notes using the texts and thus make the whole thing understandable. I can go all day and think about a certain topic and then sit down and skim through the book to confirm that I understood it right or to see if maybe I need to think some more in any case. / ... / processing is just as important to me as reading a book. (Lena 8)

Students describing a deeper learning, mention such skills as critical analysis, reflective of books and literature content, flashbacks, and preparation for the next moment. They try to connect the content to the already well-known phenomenon and the course key concepts, ask questions about the contents (text). One student has even referred to Blooms taxonomy. The quotation below display a student with a more deep-oriented learning.

I try to write down some thoughts about what I studied during the day, even go through my

schedule analyse if I reached my short goals. I need and like a moment of reflection in the evening, but it does not happen as often as I want, it's easy to forget and then you feel too tired. I'm trying to see the coming years at the university as a major challenge, to get better at writing and ask questions to climb Bloom's taxonomy (a ranking of the different forms of knowledge). Right now is the first step at a time, to reproduce and describe all the new concepts and make them understandable to me, and for others, but eventually I'll probably develop into a critically thinking and analysing student. (Lena 1)

Another student knows that it is important to mimic better models and that there is a simple way to succeed in a fast way, but "... to consciously imitate is a good start, but a poor continuation (Lena 3)" and points out that it is important to develop further on one´s own.

4.4 Active Learning Strategies

As for active learning strategies, all eight students in the high performance group use descriptions in a clear, rich, personalized, full immersion and concrete way. Three of the students have also long, detailed descriptions. These may include using a study diary for reflection and repetition, associations, read-out techniques, creative notes, notes on what can be used in professional life, preparing the course content and studying old exam questions, to get an overview of the literature, to actively search Wikipedia, going through the objectives of the course and then relate back to them, to make personal learning cards, to ensure that my body and my brain work well with water and breaks.

The in-between-group of four students describe some approaches to learning, but not to any great extent. In the low performing group only three of the students write about active learning strategies and then in a comparatively simple and uncertain manner. An example:

... I'm trying to work out and try some different techniques to see if there might be something that might work better. Have tried to make mind maps, and it felt as if it might be a good option. (Lena 16)

Overall, it is apparent in qualitative terms how the three performance groups are distinguished in terms of active approaches to learning.

4.5 Objectives

In the category of goals, no clear qualitative differences were noted between the three groups. Four of seven persons in each group described eagerly, either short or long term goals they have in training or in time. Motivation is definitely linked to their objectives, the goals also increase motivation. The objectives are described as either planning in the form of "do lists" or mental training.

4.7 Previous experience and confidence

Regarding past experiences, there is a distinction in whether they were good or bad and how this affected their self-confidence. In the high-performance group, only one person describes the lessons learned and how these can have negative repercussions on confidence:

With the realization that the goal cannot possibly be reached it turns the other way and

instead I have very low self-esteem for the way forward and this washes over all the other projects I have going on. (Staffan 1)

In the middle group, three students describe past experiences and how these affected their confidence. In the low performing group, six of seven describe how previous experiences in school influenced their thoughts, experiences, and ultimately their self-confidence. It could be about not having received feedback from teachers, being bullied, failing exams and failing to understand either teachers or peers. Two selections below:

When I think back to my high school, I see myself as the student who did what was required of me. Submitted work on time did everything to not feel like a failure./.../ I never received any direct feedback, but more of a final rating and so fine with it. I sat there quietly and listened, I had not the courage or ability to say or ask if there was something I did not understand. I would probably not characterize myself because of fear of saying the wrong thing at the wrong times. (Lena 13)

... But anyway, I and my closest friends were bullied at school / ... / They said bad words, laughing and whispering behind your back, threw stuff at us, etc. But from the time in school there are still scars, a lot because I have not told this to anyone until now as a grown up. ... / So far the studies have not gone so well, I am behind with work and I am on the verge all the time. Every failure I've ever done has been down to my low motivation which sinks even lower, my confidence is even worse. Why I fail in my studies, I believe is based on me not getting the proper time to study that I need and I don´t ask my fellow students to help me. I am ashamed to show that I do not always understand. (Lena 15)

5. Discussions and conclusions

The background to this study is the challenge our universities are facing regarding the transition to a mass education and the application of heterogeneity in terms of students (Krebs, 2007) and the mission to create opportunities for individual learning and constructive teaching methods. The purpose of this study was to investigate what influences good and poor academic performance and the patterns that exist between learning styles and approaches to learning based on academic performance. Current international research (Cools & Rayner, 2009; Evans & Kozhevnikov, 2011; Gurpinar, et al. 2010; Parpala et al. 2010; Rouhoniemi, & Lindblom-Ylänne, 2009; Vermunt, 2009) shows primarily, that there are different perceptions and perspectives on approaches to learning and that there are many factors that influence students' insights and experiences of constructive approaches to learning, these include interest, choice of education, teaching strategies and disciplines. However, there is no research based on student performance against learning styles preferences and approaches to learning. In order *not* to be successful in their studies during the first year of teacher training the following factors can be distinguished:

- tactile or kinesthetic dominant preference(s)
- surface strategies
- past experiences that influence self-esteem in a negative direction

Advantageous combinations to be successful in studies are as follows;

- auditory dominance or several strong perceptual preferences,
- the use of deep structures in learning
- use of several active learning strategies.

The perceptual dominance of high-achievers in this study is in alignment with international studies (Dunn & Griggs, 2007).

With regard to surface and deep learning, there remains many unanswered questions, such as how and when the high-performing students appropriated depth strategies, and why the underperforming students has not acquired them. An important task would be to show students the strategies called depth strategies (Marton & Säljö, 1976), and planning education and training so that this type of learning is made visible.

Given that students from different disciplines seem to use different strategies (Parpala, et al. 2010) and that this study deals with future teachers, we can consider how they as future teachers will pass the knowledge on. How will these bearers of knowledge be formed, depending on how they manage knowledge? Will the teachers reach the fourth learning patterns according to Vermunt (2011), namely, the professional, so that student teachers can use their knowledge in practical situations? If not, this would be an important area for teacher training institutions to focus on.

As for the low self-esteem experienced by students in the low performing group , it appears to be a chicken and egg situation in terms of past experience, low self-esteem and a dominant mind which is not favored in traditional teaching situations. Were these seven students harmed in earlier school situations because they had a more physical learning style and therefore their school performance was negatively affected and this in turn affected their self-confidence and ability has not been mobilized for active approaches to learning and deep learning? Or, has initial low self-esteem and bad experiences inhibited more active approaches to learning?

Academic performance cannot be explained solely as a function of learning styles and strategies. Learning environments, i.e. how education, exams, relationships between students and teachers, etc. are also of great importance in this context. Especially at the beginning of teacher education and the low-performing student group, we can see a clear mis-match between these and the old traditional academic culture. To develop good quality for this student group, there should be a prerequisite to students' approaches to learning improve, while teaching organization should be revised.

The outer structure or the learning environment is, in addition to personal qualities and abilities, the most important factors in achieving good academic results. In an ideal world therefore, matching the student´s characteristics, ambition and skills with a strategic, sensitive and thoughtful learning environment, where teachers have the opportunity to see and follow the development of each individual student and continuously adapt their teaching to student needs, and hopefully increasing competence and ability, is desirable. In university

environments that are characterized by mass education, this is difficult to achieve, but our experience is that sometimes it is quite possible, provided that the teacher participates in the group for a long period, at least one term. The matching problem is a two-way relationship in which both the individual student and faculty (or the individual teacher) has a responsibility to achieve a good quality of teaching. In conclusion, we note that in our study it seems that students´ academic achievement depriving their learning styles preferences, their (in) ability to utilize appropriate learning strategies and a university culture that (mis) match teaching strategies.

5.1 Practical Implications

The need to act upon knowledge in higher education should be a truism. This study unfortunately, indicates that the knowledge base in university didactics is low. Our study focuses on the third aspect of the didactic triangle: the student perspective. There is also a teacher's perspective and a subject matter. These three factors form the core of didactics and identify three minimum elements contained in all education situations. We see three major factors, each of which must be understood in the light of the other two.

An important question is how to match student groups. Another is the extent to which students can understand their own strategies and develop them. With mass education and a greater diversity of students it is likely that teaching at the individual level would be quite difficult. However, matching at the group level is both relevant and pedagogically possible. Some concrete examples are to match the students' need for structure, taking into account the sociological preferences, to communicate content to different dominant sensory preferences (oral, written, interactive, using text or images) and to clarify the depth strategies for tutoring. Students' knowledge about themselves and their meta-learning is an essential requirement to adapt to the academic world. The didactic triangle covers communicative and interactive aspects of the teaching process, surrounded by socio-cultural and cognitive perspectives (Ullström, 2009). The design of teaching and teaching materials will therefore also be affected. The contents of the third part of the didactic triangle i.e. the subject, cannot be ignored, but reshaped to fit the individual and the group in a better way.

This study also highlights the so-called low achievers in teacher training and their struggle against the prevailing requirements structures. These students with their experiences and approaches to learning are not encouraged in today's academy. Because of their own experiences, they may become future teachers who understand and can handle teaching so their students with 'learning difficulties´ can receive adequate support. In a broader sense, one can say that this is a democratic and educational problem.

5.2 Continued Research

This study has generated more questions than answers. There are many additional factors that affect student performance e.g. socio-economic background, values and attitudes, gender, context, age, and awareness. In this project, we continue to develop our study of materials relating to background, values, attitudes and self-awareness of the student groups. Above all, our ambition is to create a picture of how students' individual learning journeys are shaped

and what results this brings. Of particular interest is the development of the various student groups identified in the material. How will the different approaches to learning in student groups' change?

References

Alexandersson, M. (1994). *Metod och medvetande*. Göteborg. Studies in Educational Sciences

96. Acta Universitatis Gothoburgensis

Boström, L., & Lassen, L. M. (2006). Unraveling learning, learning styles, learning strategies and meta-cognition. In *Education + Training*, 48(⅔), 178-189. http://dx.doi.org/10.1108/00400910610651809

Coffield, F, Ecclestone, K, Hall, E., & Moseley, D. (2004). *Learning styles and pedagogy. A systematic and critical review*. Learning & Skills research centre. Retrieved May 10 from www.lsrc.ac.uk. http://hdl.voced.edu.au/10707/69027.

Cavas, B. (2010). A Study on Pre- service Science, Class and Mathematics Teachers´ Learning Styles in Turkey. In *Science Educational International, 21*(1), 47-60.

Cools, E., & Rayner, S.(2009). Research Style: More of the Same or Moving Forward. In S.Rayner & Cools, E. Style Differences in Cognition, Learning, and Management. *Theory, Research and Practice.* NY; Routledge, (pp 295 – 306).

Dunn, R. (2003). *Personal communication*, August.

Dunn, R., & Griggs, S. (2007). *Synthesis of the Dunn and Dunn Learning Style Model: Who, What, When, Where, and So What?* NY: St. John's University, Center for the Study of Learning and Teaching Styles.

Dunn, R. Dunn, K., & Price, G. E. (1984, 1991, 2000, 2001). *Productivity Environmental Preference Survey.* Lawrence, KS: Price System.

Dunn, R., Griggs, S.A., Olson, J., Gorman, B., & Beasley, M. (1995). A meta analytic validation of the Dunn and Dunn Learning Style model. *Journal of Educational Research, 88*(6), 353-364. http://search.ebscohost.com/login.aspx?direct=true&db=afh&AN=9510112847&site=ehost-live

Entwistle, N., & McCune, V. (2004). The conceptual bases of study strategy inventories. *Educational Psychology Review, 16*, 325-45.

http://proxybib.miun.se/login?url=http://dx.doi.org/10.1007/s10648-004-0003-0

Evans, C., & Kozhevnikov, M. (2011) Styles of Practice: How learning is affected by students' and teachers' perceptions and beliefs, conceptions and approaches to learning. *Research Papers in Education, 26*(2), 133-148. http://proxybib.miun.se/login?url=http://dx.doi.org/10.1080/02671522.2011.561973

Evans, C., Cools, E., & Charlesworth, Z. (2010). *Learning in Higher Education--How Cognitive and Learning Styles Matter*. *Teaching in Higher Education*, *15*(4), 467-478. http://dx.doi.org/10.1016/j.lindif.2010.11.009

Gurpinar, E., Mamakli, S., & Aktekin, M. (2010). Can Learning Style Predict Student Satisfaction with Different Instruction Methods and Academic Achievement in Medical Education? *Advances in Physiology Education*, *34*(4), 192-196. http://dx.doi.org/10.1152/advan.00075.2010

Hellertz, P. (1999). *Kvinnors kunskapssyn och lärandestrategier. En studie av tjugosju kvinnliga socionomstuderande*. Örebro Universitet. Institutionen för socialt arbete. Örebro, studies 17.

Hård af Segerstad, H., Klasson U., & Tebelius, U. (1996). *Vuxenpedagogik – att iscensätta vuxnas lärande*. Lund: Studentlitteratur

Högskoelverket, (2007). *Utvärdering av arbetet med breddad rekrytering till universitet och högskolor* En samlad bild. Rapport 2007:43

Kreber, C. (2007). What´s it really all about? The Scholarship of Teaching and Learning as an Authentic Practice. *International Journal for the Scholarship of Teaching and Learning*, *1*(1), 1-4. http://academics.georgiasouthern.edu/ijsotl/v1n1/essays/kreber/IJ_Kreber.pdf

Kroksmark,T. (2003). Personal communication. Augusti 2003.

Lauridsen, Ole (2007). *Fokus på læring: om læringsstile i dagligdagen professionelt og privat*. København: Akademisk forlag.

Leidman,S-E., (2011). *Hets! En bok om skolan*. Falun:Albert Bonniers Förlag

Marton, F,, & Säljö, R. (1984). Approaches to Learning. In Marton, F., Hounsell, D. & Entwistle, N. (Eds). *The Experience of Learning*. Scottish Acamedic Press: Edinburgh, (pp 36 – 55).

Mc Kinsey, & Co. (2007). How the Best Performing School Systems Come Out on Top. Retrieve May 10 from www.mckinsey.com/App_Media/Reports/SSO/Worlds_School_Systems_Final.pdf

Marton, F., & Booth, S. (2000). *Om lärande.* Lund: Studentlitteratur.

Marton, F. & Säljö, R. (1976). On Qualitative Differences in Learning: Outcome and Process. *Brit. J. Educ. Psych*, *46*, 4-11.

Mikkonen, Heikkilä, Rouhoniemi, & Lindblom-Ylänne. (2009). Study Because I'm Interested?: University Students' Explanations for Their Disciplinary Choices. *Scandinavian Journal of Educational Research*, *53*, 229-244. http://dx.doi.org/10.1080/00313830902917261

Nelson, F., Gorman, B., Dunn, R.. Griggs, S., Primavera, L., Fitzpatrick, M., Bacilious, Z., & Miller, R. (1993). Effects of Learning Style Intervention on College Student's Retention and

Achievement. *Journal of College Student Development*, *34*(5), 364-369. http://www.eric.ed.gov/ERICWebPortal/detail?accno=EJ472308

Oxford, R. (1990). *Language Learning Strategies: What every teacher should know*. Rowely, Mass: Newbury House.

Parpala,A., Lindblom-Ylänne,S., Komulainen, E., Litmanen, T., & Hirsto, L. (2010). Student´s approaches to learning and their experiences of the teaching-learning environment in different disciplines. *British Journal of Educational Psychology*, *80*, 269-282. http://proxybib.miun.se/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=afh&AN=52217750&site=ehost-live

SOU. (2009). Regeringens proposition (10:89). Bäst i klassen – en ny lärarutbildning.

Rouhoniemi, M., & Lindblom-Ylänne, S. (2009). Student´s Experience Concerning Course Workload and Factors Enhancing and Impending Their Learning – a useful resource for quality enhancement in teaching and curriculum planning. *International Journal of Academic Development*, *14*(1), 69-81. http://dx.doi.org/10.1080/13601440802659494

Studiehandledning. *(*2010) .In Studieteknik, 3 hp. X-universitet

Svensson, A. (2011). Utbildningsreformernas betydelse för elevrekryteringen. I *Utvärdering Genom uppföljning. Longitudinell individforskning under ett halvsekel*. (Red.)A. Svensson. Göteborgs Universitet. Gothenburg Studies in Educational Sceiences 305.

Tornberg, U. (2000). *Språkdidaktik.* Malmö: Gleerups.

Ullström, S.-0. (2009) Ämnesdidaktik som bro och vetenskap. In Schullerqvist, B., Ullström,

M. & Ullström, S.-0. *Ämnesdidaktiska brobyggen – didaktiska perspektiv inom lärande och forskning*. s.10 – 23. Karlstad: Karlstad University Press.

Vermunt, J. D. (2009). Patterns in Student Learning and Teacher Learning. In S.Rayner & Cools, E. *Style Differences in Cognition, Learning, and Management. Theory, Research and Practice*, 173-187. NY; Routledge. http://dx.doi.org/10.1007/s10648-004-0005-y

Vermunt, J. D., & Vermetten, Y. J. (2004). Patterns in Student Learning: Relationships Between Learning Strategies, Conceptions of Learning, and Learning Orientations. *Educational Psychology Review*, *16*(4), 359-384.

Notes

[i] During the last 10 years the number of students receiving some educational support has increased. At x-university 22 students had educational support in 2000. In 2010 the number had increased to 217, and the majority was diagnosed with dyslexia, The teacher education program received 20 of these students for educational support

[ii] Whit preference means that this is the individual´s strengths or needs from learning new and difficult information

[iii] Preference is used synonymously in this text with the words features, elements and factors.

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[iv] Research has examined students in elementary and secondary schools, not college students.

[v] CAP (Contract Activity Package, PLS (Programmed Learning Sequences) and MIP (Multi Sensory Package) are methods in learning styles research which match different preferences.

[vivi] The subjects were allotted names Lena 1 – Lena 18, and Staffan 1 – Staffan 3.