

## Students' Self-Confidence and Learning Through Dialogues in a Net-Based Environment

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The study describes the factors that render possible and restrain students' learning when they try to develop new knowledge through collaboration in a net-based learning environment. The pedagogical platform takes as its starting-point a framework of socio-cultural theories of learning and is based on dialogues and collaborative situations in small groups. Results of the study have been extracted using statistical analysis of students' understanding of the concepts of knowledge and learning as well as self-confidence. To ascertain whether or not students' learning has benefited from the net-based dialogues, background factors such as gender, socio-economic background, and ethnicity have been accounted for in the overall analysis. Results show that there are relatively big differences between the students' approach to knowledge and learning and that this appears to influence their behaviour during the course. The analysis shows that only some students develop a good ability for using dialogues as an important learning resource, while others do not choose to utilise this opportunity. Furthermore, results show that students' descriptions of themselves are clearly related to their course activity and to their examination results. A surprising discovery is that students with a non-academic background seem to utilise this opportunity for collaboration to a much greater extent than others, and also achieve better examination results.

This study describes 70 student teachers attending a 10-week course during their first term of Teacher Education in Sweden. A large part of the course is net-based, whereby the students, in groups, are required to solve problems and discuss literature. Course content is mainly concerned with the development of children and youths, and aims to add to the knowledge of human beings' different perspectives on development and learning, while at the same time offering the students the opportunity to critically reflect on the Swedish School's commission of being able to provide potential learning environments for all students. Part of the aim is also to provide the students with opportunities for reflecting over their own learning and, by so doing, develop a meta-cognitive awareness.

Many studies (Koschman, 2002; Stahl, 2002) within different educational and scientific research communities (e.g., Computer Supported Collaborative Learning, Peer Learning) describe how students' knowledge and skills develop when they collaborate in various net-based learning environments. Through common efforts, the course participants are required to solve different kinds of problems and to share new knowledge during the problem-solving process. In these situations, collaborative learning is seen as providing opportunities not only for individual students' knowledge and skill development; here learning becomes the common product of an interactive collaborative process where different perspectives meet and scientific artefacts are worked on.

Knowledge acquired in this way becomes nonstatic, vibrant, and locally and historically situated. In a classic study, Scardamalia and Bereiter (1994) described ways in which groups of students in these types of learning environments create knowledge-building communities, which become self-reflective and generate self-organising systems where each individual contributes with his/her own expertise and in return receives new knowledge and skills. More recently, Bereiter (2002) contended that knowledge building cannot specifically be viewed as a common learning process but also as an aim-related activity with the focus on creating a conceptual artefact. Koschmann (2002) described net-based learning environments as knowledge-building practices mediated through technically designed artefacts aimed at supporting common collaborative meaning making. In this way, learning can be understood as promoting the student as an active participant of a community, and knowledge as an aspect or product of a practical discourse (Lave & Wenger, 1991).

A number of studies (Guzdial, 1997; Lipponen, 1999) shows that students do not always actively participate in electronic dialogues nor that they—in these types of courses—produce relatively superficial results. Fur-

thermore, these studies show that there are often relatively big differences between different individual's activities and their ability to collaborate. Lipponen (2002) contended that a situation where students cooperate with the aid of an individually designed computer programme cannot be regarded as Computer Supported Collaborative Learning. According to Lipponen (1999), net-based learning environments need to be designed and based on theories of collaborative learning.

### OVERRIDING ASSUMPTIONS AND RESEARCH QUESTIONS

Stahl (1999) contended that common reasons for the fact that computer supported collaborative learning does not always work is due to personal or cultural differences among students and that the pedagogical platform does not take these differences into consideration. In conjunction with this, one can question what these personal or cultural differences in fact consist of and how significant they are. One assumption in this study is that students' different experiences, approaches to learning and self-confidence are all of significance to how they interact and to what they learn during the course. Another assumption is that there are relatively big differences between the students' views of knowledge and learning and that these are relevant to how they act in a computer-mediated environment. Yet another assumption in this study is that students who are able to actively use computer-mediated dialogues are also more successful in their examinations. Another possible hypothesis is that students with a poor socio-economic background or who have language problems due to an ethnic background one can assume are at a disadvantage when, without proper prior training, they are expected to be able to collaborate using the Internet.

Research questions in the present study are:

- How important are students' approaches to and their understanding of the concepts of knowledge and learning to how they interact in computer-mediated dialogues?
- Is it possible to assess students' achievements beforehand by examining their epistemological approach and self-confidence prior to the course?
- Do net-based dialogues benefit students' learning regardless of gender, socio-economic background, and ethnicity?

## THEORETICAL PERSPECTIVES

Seen in a socio-cultural perspective, language and the discursive practices where language is used are fundamental for human development and learning. In this way, language becomes a kind of mediating tool in dialogues and discussions. Discursive practices influence the ways in which we use language and helps us to develop different forms of thought (Vygotsky, 1986; Wertsch, 1991; 1998; Säljö, 2000). In a functional linguistic perspective, new knowledge and new prerequisites are constructed and reconstructed through continuous interaction with others. According to a socio-cultural perspective both language and thoughts develop in this way. Wickman and Östman (2002) even contended that it is impossible to separate language from the discourse in which it has arisen. Learning is here viewed as a successive change of discourse within social practice. They take as their starting-point Wittgenstein's "language games" (1992) where language and practice are seen as synonymous. This implies that language, practice, learning, and meaning cannot be understood as separate entities, but rather as a whole.

We learn and develop our language through partaking of discursive practices; in this way discursive practices also keep on developing and changing. In this sense one can say that there exists a dialectic relationship between the concepts of learning, language and discursive practice. One way of understanding how learning and language can develop in discursive practice is to use Bakhtin's (1981) theories of the importance of dialogue as a starting-point in trying to understand the relationship between discussion and thought. According to Bakhtin, "dialogicality" implies that others enter into a conversation not only as a listener, but also as a participant relating to what we think and say. Others' voices and perspectives influence us by being interwoven into our thoughts and utterances. Every utterance is created in relation to the intention and the accent, in another or other utterances. The words we use in a conversation are in part someone else's that we have made into our own when we sympathise with their intentions. They are not part of a neutral or impersonal language, but come through in others' voices as a support for their intentions. Bakhtin named this phenomenon "ventriloquation."

Another way of understanding learning in discursive practices is to use Engeström's (1987) activity theory in *learning by expanding*. This theory takes as its starting-point the fact that human learning or development originates in learning activities that are embedded in other productive and social activities. Activity systems, such as collaborative learning through the Internet, can be created by a collective motive reaching further than purely

individual intentions. In this way, an activity system becomes more than simply the sum of individual aspirations.

## THE PLATFORM

The students in this study used a specially developed net-based learning environment platform (Accessibility and Learning in Higher Education). The AHLE-3 platform has been developed over a period of three years based on a framework of socio-cultural theories. It exists within a tradition of platforms within the Computer Supported Collaborative Learning movement (Stahl, 2002). The construction of a learning environment in the AHLE-3 platform is based on dialogues and active participation in collaborative situations in small groups. AHLE-3 is also characterised by meta-cognition and self-reflection. This means that the individual participants are expected to reflect over their learning strategies, learning attitudes (Jakobsson, 2001; 2002) and their approach to learning and knowledge. In addition, the students need to analyse ways in which they themselves contribute to the development of the group. This is done in part by categorising their individual input during collaboration. Some examples of categorisation are innovation, hypothesis, theory, question, social contact, comments, information, encouragement, and criticism (Malmberg & Svingby, 2003).

## METHOD

To be able to identify and study background factors that influence the students' approach to knowledge and learning, the students were asked to answer a questionnaire (30 questions) during the first week of the course. They also answered 15 questions related to how they experience their own capacities for succeeding with higher educational studies. The questionnaires included statements such as "all knowledge can be measured," "learning consists of partaking of and demonstrating that one has understood the teacher's or the textbook's explanations," "learning comes easy to me," and "I feel comfortable in academic settings," and so forth. Using factor analysis, we have been able to interpret three factors: (a) students' epistemological approach (Figure 1), (b) self-confidence related to studies, and (c) self-confidence related to the academic setting. By summarising the items with high loadings in the first factor it was possible to identify two groups of students. Reliability analysis shows a fairly high homogeneity (Cronbach's  $\alpha = .80$ ). For the sake of simplicity I describe these groups as students

with an authoritative, single dimensional epistemological approach and students with a nonauthoritative, multi-dimensional epistemological approach. This however does not imply that all possible attributes are represented within these categories. Statements where there was no differentiation between the groups were for example “learning is finding meaning in what is read,” “one both learns facts and understands them simultaneously,” or “learning implies questioning things.”

<b>Epistemological approach</b>	
-	Learning implies remembering that which one has read or heard.
-	All knowledge can be measured.
-	All knowledge can be observed.
-	If one is clever one can partake of and demonstrate the teacher's or the textbook's explanations.
-	If one is clever one can reproduce knowledge from the teacher or the textbook

**Figure 1.** Items with high factor loadings related to the “epistemological approach”

Regarding students' self-confidence, two different categories have been created in the same way. The two variables are students' experiences in regard to succeeding at their studies and if they feel comfortable in an academic setting. These have been termed *self-confidence: studies* and *self-confidence: the academic setting* (Figure 2). Reliability analysis for these two variables shows .66 and .68 respectively (Cronbach's alpha). Statements where there were no similar covariance's were for example “team work challenges my thinking,” “team work takes too long,” or “I let others talk and rather listen.”

<b>Self-confidence: studies</b>	
-	I normally succeed with my studies.
-	Learning comes easy to me.
-	I have a good learning strategy.
-	It's easy for me to know what is expected of me.
<b>Self-confidence: the academic setting</b>	
-	I feel comfortable during academic seminars where one questions and discusses.
-	I know precisely how I need to approach my academic studies.

**Figure 2.** Items with high factor loadings related to self-confidence concerning studies and items related to self-confidence concerning the academic setting

Students, who to a large extent support these statements, have been categorised as students with good self-confidence in regard to succeeding at their studies and feeling comfortable in academic settings.

In addition to the questionnaires related to an epistemological approach and self-confidence, background variables such as gender, ethnicity and socio-economic background have been collected and correlated with the previously mentioned categories. Empirical data also included other variables, for example examination results, number of contributions in the discussion forum, experiences of working in a group and experiences of web-based learning. This means that a total of 53 variables have been used to execute a substantial correlation analysis using SPSS. Only some of these variables are presented in this article. Additional articles will be presented using qualitative analysis of students' dialogues and examination results (Malmberg & Svingby, 2003).

## RESULTS

### Differences in Epistemological Approach

Results of the correlation analysis show significant differences between the student teachers' approach to knowledge and learning at the start of the course. This is the case if the assumptions in Figure 1 can be said to represent students' different approaches. Reliability can be judged in more detail to try and find out if there are any substantial differences between how students in the two groups act, how they use the platform and their examination results. If one correlates the factor *epistemological approach* with a number of other factors the result is interesting. But there are also results that show that the factor *epistemological approach* is not clear enough or well defined. It is a little surprising that the group with an *authoritative, single dimensional epistemological approach* have used the platform and communicated by way of a computer to a much greater extent than the other group. Students in the *authoritative, single dimensional epistemological approach* group have also stated that they have not had as much computer experience prior to the course as the other group. Furthermore, analysis shows that the group with an *authoritative, single dimensional epistemological approach* experience have exerted themselves more and that they to a greater extent have experienced the course as more worthwhile than the other group. There is however no clear relation between the factor epistemological approach and examination results. In Table 1 the students' authoritative, single dimensional epistemological approach is related to their experiences of the course and with examination results.

**Table 1**

The Relation Between Students' Epistemological Approach (authoritative, single dimension), Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Statement/question	Pearson's corr	p-value	Level of significance
Have solved the exercises by communication via the Internet (never – <b>a lot</b> )	.332	.012	*
How often did you use the Internet before starting the course? ( <b>never</b> /once a day)	-.353	.007	**
How often did you use to chat before starting the course? ( <b>never</b> /once a day)	-.416	.001	**
As a whole the course has been (not worthwhile – <b>worthwhile</b> )	.315	.017	*
How hard have you tried to solve the exercises to the best of your ability? (nothing – <b>very much</b> )	.303	.022	*
Examination results (fail – pass)	.019	.886	-

That which becomes apparent is that students with an *authoritative, single dimensional epistemological approach* appear to be the students who solved the exercises through the platform despite the fact that they don't have much experience using the Internet. They also appear to be students who, to a great extent, have exerted themselves to succeed and who experience the course as worthwhile. The group with the *nonauthoritative, multi-dimensional epistemological approach* appears harder to describe. These students do not believe in statements such as "if one is clever one can reproduce knowledge from the teacher or the textbook" or that "all knowledge can be measured." At the same time it appears that these students actually choose not to solve their exercises through communication through the collaborative platform. Nor have these students experienced that they have exerted themselves to solve the exercises; on the whole they haven't experienced the course as especially worthwhile. At the same time they have succeeded with their exams just as well as the other group. It seems that the factor *epistemological approach* in effect measures something else than what was expected. This will be commented on further in the discussion.

### Students' Self-Confidence Clearly Related to Their Activities and Examination Results

The factor related to students' self-confidence has been divided into two specific factors, namely *self-confidence: studies* and *self-confidence: the academic setting*. The first describes students' self-confidence related to succeeding at their University studies and the latter to feeling comfortable in academic settings. Students who have stated that they feel comfortable in an academic environment contribute less to forum discussions on the platform. This implies that they do not initiate as many new discussions as the nonacademic group. In other words, they have not been as active. The academic group also believes that a collaborative pedagogical platform cannot replace "face to face" meetings. Students in the group who don't directly feel at home in an academic setting contribute more to the discussion forum. Analysis also shows that this group significantly demonstrates that working through the Internet can compensate "face to face" meetings. There is a low correlation showing that the group who does not feel comfortable in academic settings achieves better examination results. In Table 2 the group of students who do not feel comfortable in academic settings has been correlated with their experiences of the course and their examination results.

**Table 2**

The Relation Between Students Who Feel Uncomfortable in an Academic Setting, Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
Amount of contribution in forum discussions ( <b>few/many</b> )	.254	.056	
Number of "threads started" by student ( <b>few/many</b> )	.299	.024	*
This course will be useful to me as a teacher (not true – <b>true</b> )	.257	.059	
Working via the Internet can replace "face to face" meetings (not true – <b>true</b> )	.277	.041	*
Examination results (fail – <b>pass</b> )	.227	.089	

\* "Threads started" refers to how many new discussions the student has started

Analysis also shows that students in general have a very good understanding of their own capacities for succeeding with higher studies. There is a clear relationship between the student group who contends that it has the capacity to succeed with higher studies and those who in effect do well in the exams. Students with a positive self-confidence believe inspired working on the Internet and also feel that technically it works well. They have at times experienced the study pace as low and felt that they have worked harder than the others in the group. In Table 3 the group of students who have a positive self-confidence in relation to their own capacity is correlated with how they succeed in their exams and how they experience the course as a whole.

**Table 3**

The Relation Between Students Who Have Good Self-Confidence, Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
Examination results (fail-pass)	.293	.027	*
Working via the Internet has been (frustrating-inspiring)	.257	.059	
The study pace has been too (high-low)	.296	.028	*
I have worked harder than the others in the group (don't agree-agree)	.308	.024	*
Technically I think all has functioned (badly-well)	.274	.045	*

### The Group as an Important Resource for a Revised Epistemological Approach

In their evaluations the students were asked if their participation in a collaborative web-based course had changed their views of knowledge and learning. Analysis of the answer points to some interesting results. The students who believe that the course has changed their view of knowledge and learning also say that the group has been an important resource in their work. This connection is clearly significant. These students also believe that they will be able to use what they have learned in this course in their future profession to a greater extent than the group whose view of knowledge has not changed. It is also interesting to note that students who imply that their view of knowledge has changed to a much greater extent believe that the course has changed their view of teaching and their future role as teachers.

They also, to a greater extent than the others, experience the web course as worthwhile and would even recommend other students to partake of web courses in the future. Furthermore, they feel it has been inspiring to work through the Internet. At the same time, there are no connections between the group and examination results. In Table 4 students who experience that their participation in a web-based course has changed their view of knowledge and learning are correlated with experiences of the course and examination results.

**Table 4**

The Relation Between Students Who have Experienced that Participating in a Web-Based Course has Changed Their View of Knowledge and Learning, Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
The group has been an important resource for my learning (not true-true)	.317	.010	**
The course has changed my views on what it means to be a teacher (not true-true)	.389	.001	**
As a whole the course has been (not worthwhile-worthy)	.457	.000	**
Working via the Internet has been (frustrating-inspiring)	.248	.046	*
Examination results (fail-pass)	-.031	.805	-

### Students with a Nonacademic Background Do Better

One of the study's research questions has been to find out if net-based dialogues benefit students' learning irrespective of gender, socio-economic background, and ethnicity. One way of trying to answer these questions has been to correlate the students' examination results with these variables. Analysis shows some anticipated as well as some unexpected results. There are, for example, no connections between the factors *gender* and *examination results*. At the same time, female students have experienced their tutoring as insufficient and the study pace too high. Furthermore, more women than men have had prior limited experience of using the Internet. Female students, to a greater extent than male students, have felt frustrated when working through the Internet. There are however no differences at all be-

tween women and men in relation to experiencing the group as an important resource for their learning during the course. In Table 5 female students' experiences have been correlated with examination results and experiences of the course.

**Table 5**

The Relation Between Female Students, Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
Examination results (fail-pass)	-.010	.933	-
Feedback from the tutor has been (insufficient-sufficient)	-.285	.021	*
The study pace has been too (low/high)	.334	.007	**
The group has been an important resource for my learning (false-true)	.189	.132	-

It is also evident that there is a connection between the factors *father's educational background* and *examination results*. This is a surprising result as students who have a father with a lower education do better at their exams than those who have a father with a higher education. One of several possible explanations can be that students with a father who has a lower education have been more active during the course than the other students. These students have also used the collaborative platform to a much greater extent than students who have a father with a higher education. Furthermore, they have solved exercises through communication through the Internet much more than the other group. This despite the fact that they had little experience of working with computers prior to the course and sometimes find it frustrating working through the Internet. A similar picture becomes evident when comparing the mother's educational background with the same variables. Here other significant relations support the hypothesis that students with a low socio-economic background appear to be much more active than other students and also use the platform's collaborative resources more. For example, students who have a mother with a lower education contribute more to the discussion forum than the other students. In Tables 6 and 7 the students' socio-economic backgrounds are correlated with examination results and experiences of the course.

**Table 6**

The Relation Between Students With a Low Socio-Economic Background (characterised by the father's education), Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
Examination results (fail-pass)	.226	.073	
Have solved exercises through communication via the Internet (not all all-a lot)	.358	.004	**
How often have you chatted prior to the course? (never-often)	-.359	.004	**
Working via the Internet has been (frustrating-inspiring)	.302	.015	*

**Table 7**

The Relation Between Students With a Low Socio-Economic Background (characterised by the mother's education), Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
Total number of contributions in forum discussion (few/many)	.279	.025	*
Have solved exercises through communication via the Internet (not at all-a lot)	.281	.023	*

About one fifth of the students are born in countries outside Sweden or speak a foreign language. These students' experiences have been thoroughly accounted for to ascertain whether or not they have benefited by partaking in a web-based course. A closer look at the foreign language group reveals some interesting results. In contrast to the others, this group has experienced the course as most worthwhile. They believe that due to working through the Internet they have been encouraged to partake more during discussions; they also believe that meeting in a collaborative web-based course can compensate for "face-to-face" meetings. These results are particularly interesting as they point to this group as being well able to use the resources offered by a collaborative platform. Furthermore, it is evident that these students have been just as active as the group of Swedish speaking students. They contribute just as much during discussion forums and initiate as many discussions as the other group. Despite this, they do not do as well at their exams. There

is a significant relation between students who speak a foreign language at home and failing the course. In Table 8 students' ethnic background, characterised as the language spoken at home, is correlated with experiences of the course and examination results.

**Table 8**

The Relation Between Students Who Speak a Foreign Language, Their Answers to Specific Statements and Their Examination Results ( $n=70$ )

Factor/statement	Pearson's corr	p-value	Level of significance
As a whole the course has been (not worthwhile- <b>worthwhile</b> )	.229	.067	
Working via the Internet implies that I have partaken in discussions (less than usual- <b>more than usual</b> )	.226	.073	
Working via the Internet has been able to compensate face-to-face meetings (not true- <b>true</b> )	.233	.061	
Examination results ( <b>fail</b> -pass)	-.247	.045	*
Total amount of "threads started" by the student (few-many)	-.047	.707	-

## DISCUSSION AND CONCLUSIONS

### Pronounced Differences in the Students' Approaches to Knowledge and Learning

It is possible to ascertain that there are relatively big differences between the students' different approaches to knowledge and learning when they start the course. It is also clear that this relation influences the way in which students act and how they are able to use the collaborative platform for working together. Some students appear able to use the possibilities for learning through collaboration to a much greater extent than others. Some students appear to lack the ability to cooperate or choose not to take advantage of the opportunity given for collaboration. This is in itself an important result pointing to the fact that it cannot be taken for granted that all students will automatically partake in the activity offered by a web-based course. In this regard Guzdial (1997) and Lipponen's (1999) earlier studies can, to a large extent, be confirmed. The fact that pedagogical platforms on the Internet naturally create knowledge-building communities (Scardinalia & Bereiter,

1994) or that students themselves attend to collaborative meaning making (Bereiter, 2002), seems unrealistic. A socio-cultural theory of learning can in instances such as these, be said to describe ideal collaborative situations or act as some kind of aim to strive towards. At the same time, much points to the fact that some students have or are in the process of developing a collaborative competence during the course, which means that they are able to see the advantages in using dialogues as an important learning resource.

In Table 4, a group of students is described for whom the course has helped change their approach to knowledge and learning. They also imply that this has resulted in a changed attitude to their future role as teacher and that they experience the group as having been an important resource towards this development. A vital factor related to success seems to be that the pedagogical collaborative platform includes metacognitive tools that successively aid the students' ability for collaboration. An important practical implication for teacher education programs and webbased platforms is that one needs to create a system that helps the students realise that there are big advantages with collaboration. This also points to the fact that students should be trained to develop their epistemological understanding about their own learning and understanding of the concept of knowledge.

In further development of the AHLE platform, these conclusions will be used in order to—in a much more conscious way—try to build up students' capacities for collaboration at the start of the course. This study has shown that this is vital for how they handle the course and what they get out of it. It also shows, somewhat surprisingly, that students in the group with an authoritative, single dimensional epistemological approach have been more active, exerted themselves more, and used the collaborative opportunities offered by the platform to a greater extent than the other group. The students with a nonauthoritative, multi-dimensional epistemological approach have been more passive, have not exerted themselves as much and have not utilised the platform's collaborative opportunities. In addition, they have to a greater extent been critical of statements such as *learning implies remembering that which one has read or heard, all knowledge can be measured or if you are clever you can reproduce the teacher's or the textbook's knowledge*. In other words, it is obvious that this variable hasn't been clear enough or well enough defined to describe the students' approach to knowledge and learning at the beginning of the course. Rather, the variables appear to describe students who have a nonauthoritative or even a counter approach to authorities and the academic world. There is no relation between the students' epistemological approach and examination results. To gain more knowledge of the importance of the students' approach to knowledge and learning, further analyses will be conducted. At the same time, it has been

essential to describe this group of students as they have so clearly chosen not to partake of the collaborative possibilities offered and have stood outside collaboration with the group.

Another group of students, who to a great extent have chosen not to partake of the possibilities for collaboration, are those who have stated that they feel at ease in academic settings. Even this result can seem surprising because they do not do as well in the exams as the other students. At the same time the study shows that these students have been more passive during the course, contributed less to the discussion forum and initiated fewer discussions. These students also believe that working through the Internet can't compensate for "face-to-face" meetings. One possible hypothesis is that these students' lack of activity has resulted in that they haven't done as well in the exams as the other students. Another probable hypothesis is that students who feel at ease in academic settings don't experience collaborative learning as positive or especially effective. Could it be that this group of students in fact identify with a more traditional academic approach where the individual is expected to fend for him/herself and therefore actively chooses not to collaborate?

### Self-Confidence Creates Prerequisites for a Successful Course

The analysis shows a significant relation between students' self-confidence in regard to succeeding with their studies and how they in effect succeed with their exams. The analysis also shows that students have a very good understanding of their own capabilities for succeeding with their exams during the first week of the course. Students with good self-confidence experienced working through the Internet as inspiring, they felt they had worked harder than the others and that the study pace had sometimes been too low. This result can be seen as significant as it makes evident the possibility for prior prognosis based on self-assessment before the start of the course. A practical implication then is to develop different types of learning support resources for students who do not have good self-confidence in forthcoming generations of pedagogical platforms and in teacher education programs.

### Students with a Nonacademic Background are More Successful

An important question in this study has been to find out if net-based dialogues have benefited learning irrespective of gender, socio-economic

background, and ethnicity. Analysis shows that female students, to a greater extent than male students, experience tutoring as insufficient, that it has sometimes felt frustrating to work through the Internet and that the study pace has been too high. At the same time there are no relations between the factor of gender and examination results or how the course has been experienced in general.

An interesting and perhaps somewhat surprising result is that analysis shows that students with a nonacademic background do better at exams than the other students. If the students' socio-economic background is characterised by the father's academic background, some interesting results are revealed. Students with a father with a limited education do better at exams than other students. A possible explanation is that they to a greater extent than others have a high level of activity, to a greater extent solve their exercises through communication by way of the platform and have experienced working through the Internet as inspiring; this despite the fact that they lacked prior experience of working through the Internet. This result is especially interesting as it points to the fact that this student group does not appear to have been disfavoured by working collaboratively using pedagogical platforms on the Internet. To claim that students with a low socio-economic background are especially favoured by partaking of this type of course would perhaps be an exaggeration. But it is clear that this group of students do in fact use the resources that collaborative cooperation through the Internet offers and that this seems to be one of the reasons they do better in the exams than the others.

### The Study Raises New Questions

A quantitative study such as this can in effect only show a general picture of how students with different backgrounds or experiences are able or not to use the resources offered in a web-based collaborative course. The study can also point towards tendencies implying that some students choose not to use collaboration as an important learning resource. Unfortunately, this kind of study does not create possibilities for describing the reasons for these conditions on a deeper level; it can only point to their existence. It is therefore important to point out that research within the AHLE project also intends to use qualitative studies to try to clarify the questions raised in this study. For example, it seems that the students' approach to the concepts of knowledge and learning is significant for the way they handle and use the resources offered during the course. At the same time it is evident that the tools used in

the study have not been sufficiently well defined or clear enough to show their influence. Other examples of questions that need to be made clearer are why students' with a low socio-economic background seem to use the collaborative resources offered during the course to a greater extent than others and why they do better at their exams. Or why students' ethnic background seems to have significance in regard to how they interact during the course and how they do in the exams. It is probable that a language test is needed to get a clearer picture. It also appears necessary to analyse how different student groups in fact interact during the course and to describe this interaction.

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