

# **Networked Learning in a Flexible Fully Internet-based International Masters' Course - Possibilities and Limitations**

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## **Abstract**

This qualitative study considers students' experience of learning in the fully internet-based LUMA-GIS programme: Lund University Masters' programme in Geographical Information Systems (GIS). The introductory course of the LUMA-GIS programme offers online forums for interaction with teachers and fellow students to support a Learning community on-line where networked learning is afforded. Since the course design is flexible there is a choice for students' whether to communicate with fellow students and/or teachers or work alone. The study is empirical and the research question was approached from a phenomenographic perspective. The main objective of the research was to understand and describe different ways that interaction in online forums promote and support learning. The research was carried out through the lens of the students' experiences of learning in the programme. The results revealed three main categories describing qualitatively different ways that interaction in online forums support learning. The three categories are made sense of in relation to Moore's theories (1989, 1993) on transactional distance.

## **Keywords**

Student experience, deep and surface approach, distance online learning, flexibility, diversity, context of learning, learning interaction, transactional distance, learner autonomy, networked learning.

## **Background**

GIS is a tool to capture, store, structure, analyse and visualise geographical data. It is an efficient tool that is widely available to both professionals, with needs for new competencies, and students whose future work will include GIS. The long-term goal with the Masters programme LUMA-GIS is to provide an international and flexible training for professional GIS users as well as novice students. Hence, the GIS education has to be *multidisciplinary, diverse and international*, since the need for training is global, *both theoretical and practical, involving problem solving as well as hands-on training, and flexible*, so that students can study how, where and when they want.

LUMA-GIS, in operation since January 2004, is given in English for professionals and traditional students from all over the world; it is free of charge and mediated by the Internet., possible to study at a flexible pace and optionally worked at individually or in networked cooperation. It was designed to be very flexible, not only in terms of starting date, study tempo (25%–50%–100%), study mode (Online–CD-ROM) and material format (text–audio–video–interactive tool), but also in terms of the possibility to work alone. Students attending the programme come from diverse backgrounds both in terms of nationality, age, gender, family situation, employment, and previous disciplinary studies, and also differ in terms of previous experience of distance learning and access to a computer and Internet connection.

## Theoretical framework

Flexibility is a key-construct in relation to distance learning and instructional design. Collis and Moonen (2002) define five dimensions of flexibility (Time of participation, Content in the course, Entry requirements, Instructional approaches and learning materials, and Course delivery) to identify and discuss where students can be offered more choices in on-line courses. A range of flexibility dimensions can be addressed, both from learning- and teaching perspectives, to plan affordances for learning (Boud, 2004; Gaver, 1996) in the virtual learning environment.

According to earlier studies on student experiences of on-line learning as compared to on-campus learning students have both positive and negative experiences. Written feedback to peers in an asynchronous forum e.g. lead to deeper cognitive processes and more reflection compared to oral feedback in class (Petrides, 2002; Vondervell, 2003) and thoughtfulness and accuracy increase with written contributions in a forum (Song et al., 2004). Online group activities in a course provide students with ample opportunities in which to practice cooperation and problem solving skills which, in turn, furthers learning both in the group and individually. These activities also provide opportunities in which to acquire proficiency in communicating in a group online, and not only on campus (Wegner et al., 1999). On the other hand, students refer to feelings of considerable frustration when studies were held back by technical problems, either with one's own computer, the connection to the Internet or with the remote course site – the virtual classroom (Song et al., 2004; Laurillard, 2002). Students also do not appreciate when communication is delayed, especially when the communication concerns feedback from the tutor (Hara & Kling, 1999). The students would like to have the same rapid and direct responses to questions or experienced problems that can be received in a lecture hall on campus (Petrides, 2002). Not being able to meet as a group on campus leads to feelings of frustration both between students and between lecturers and students. It seems especially difficult to gain clarity with regard to the structure of rules and procedures for examination and marking (Howland & Moore, 2002). Students in online course also find it more difficult to understand and to get a clear picture of the tutors' instructions than it would be on campus. They feel that they get less background information about the design and realisation of the course (Wegner et al., 1999). The fact that it is more difficult to get to know the tutor and to learn something about his or her personality is also experienced negatively. (Vondervell, 2003, Song et al., 2004; Rovai & Wighting, 2005). Students also vent feelings of isolation (Song et al, 2004) and that they find it more difficult to experience fellowship and affiliation, both with tutors and fellow students, and in relation to departments, schools and the academy as a whole (Tinto, 1998; Rovai & Wighting, 2005).

Interaction is of central importance in all educational situations, not only in various forms of distance education. However, it is of particular importance in distance education contexts since interaction must take place between tutors and students, even though they are more or less separated from each other in time and space. Studies focusing on interaction in net-based course environments send us in different directions. Wegerif (1998) emphasizes the importance of social contact in the interactive situation for learning online while Du and Li (2005) emphasize the value of online interaction focused on the subject, content and tasks. According to Lave and Wenger (1991) interaction contributes to the students' experience of being a participant in a *community of practice*. Lally and Barry (1999) further expound on this and claim that learning develops through online communication in a net based community of practice. The concepts of *learning networks* and *networked learning* (Goodyear et al., 2005) are well established where IT is used to support learning interaction between one student and other students, between students and tutors, between a learning group/a learning community and the resources for learning to which the group has access. The person-to-person interaction plays the most fundamental role in networked learning, and it is thus not only the interaction between person-and-resources online that is important. Dysthe (2002) holds that it is due to the diversity of voices, the *multitude of voices* discussing, arguing and, in other ways, contributing to asynchronous discussions online, that forums have a vast potential to qualitatively contribute to the students' learning and development. She goes on to claim that the extent to which individual students accommodate this potential is formed by both contextual and personal factors.

According to Moore (1989) three different types of learning interaction can be identified, namely Learner–Content, Learner–Teacher, and Learner–Other Learners. Within the first type of interaction the

learning process is driven by an intellectual dialog between the student and the learning material. In order to make this happen the student needs access to material he or she can analyse, manipulate, enhance, and communicate in different ways. The second type of interaction is, according to Moore, the most common way of interacting in traditional instruction. Often it is characterised by “transfer” of knowledge from the teacher to the student. However, Moore also stresses that students need dialogue, including feed-back from the teacher. According to Moore the third type of interaction is the most interesting in learning at a distance. Through computer aided communication, like an online forum, group discussions are made possible. Such a group discussion has, again according to Moore, possibilities to be even more beneficial than traditional group discussions on campus. Within the student-to-student interaction the learning process is strengthened by discussions and ideas related to a specific issue. Moore holds that the asynchronous communication, delayed and visible to the participants, is more beneficial concerning reflections and critical thinking than verbal communication in real time.

There are indications to be found in the literature that participants in online interaction occupy different roles. On the one hand there are the participants of the forum who are active, the so-called “posters”, and on the other hand we have their opposites, the so-called “lurkers”, the invisible participants who read but do not themselves contribute to an online discussion (Nonnecke et al, 2004). Comparisons made between lurkers and posters have shown that both have the same motive for participating – i.e. going online – namely that they want answers to their questions. A lurker will not openly pose a question but is nonetheless seeking an answer. Lurkers do not see so many advantages with on-line discussions and they feel to a lesser extent part of a learning community. Posters on the other hand generally gain more satisfaction from the discussions and many do not hold any feelings of resentment towards lurkers. They do not think of them as “free riders” who merely take from the forum without making any contribution themselves. Further, Nonnecke et al (2004) have also found lurkers who eventually go over to become posters: “...start their existence in a new community as a lurker until they have learned the rules and norms of the community” (Nonnecke et al, 2004, p 9). Fåhrens and Diös (2006) introduce another name for this type of participant – the “mingler”. The mingler takes part in the course but does not participate very actively in discussions to begin with. Fåhrens and Diös claim that the mingler likes to keep a low profile at first: they would only read and/or write very neutral contributions and answers until such time that he or she feels secure and has learnt “the ropes”. The mingler will then successively and at his or her own pace begin to make more personal contributions (Fåhrens & Diös, 2006).

In distance learning the students and tutors are more or less separated from one another, both with regard to geographic location and time. Consequently, as a result of this physical distance, even a *pedagogical distance* arises – a transactional distance – in the form of a psychological and communicative distance between tutor and student (Moore, 1993). The pedagogical distance – a transactional distance – increases when the dialogue in the course is weak and the structure is strong. Conversely, the pedagogical distance decreases as the dialogue grows stronger and the structure weakens. According to Moore, a consequence of this would be that the lower the transactional distance, the greater the freedom and responsibility to set up one’s studies according to one’s own choice with regard to what, how, when and in which order the work is to be done (Moore, 1993).

## Method

The aim of the study was to investigate the different ways in which students study and learn in a distance learning context with particular focus on interaction in online forums. The study is empirical and the research question was approached from a phenomenographic perspective (Svensson, 1984, Marton & Booth, 1997). The main objective of the research was to understand and describe different ways that interaction in online forums promote and support learning. The research was carried out through the lens of the students' experiences of learning in this flexible course. The empirical data consists of written answers from 110 LUMA-GIS students on the question:

Please comment in which way the online forums were helpful in your learning (please give examples).

The answers were analysed on a collective level and not as individual reflections.

## Results

The results of this study indicate that LUMA-GIS students have different objectives for participating and different ways of interacting in the online forums of the course. The students have experienced the flexible context of the course in qualitatively different ways, and this in turn seems to have influenced the ways in which they have interacted with tutors and one another in the online forums. It may also have influenced exactly *what* in the interactions that has been meaningful to them.

The results reveal three main categories describing qualitatively different ways that interaction supports learning in this fully internet-based masters' course. Each category gets its distinctive character from the students' experiences of, and attitudes towards, the flexible context of the course. The three categories are spread out between low and high transactional distance, and reveal different forms of interaction as part of the process of learning. The three categories are called:

- A. *Learning in*
- B. *Learning from*
- C. *Learning with*

The transactional distance, i.e. the pedagogical distance in a psychological and communicative sense, is low for those students who have interacted frequently and regularly both with tutors and fellow students, and who have utilised the possibilities provided by the flexibility of the course to choose the structure, content and working methods of their preference. These students show a high degree of learning autonomy. Conversely, the transactional distance is high for those students who have experienced the flexible context in a negative way and who have neither interacted nor utilised the available possibilities to decide over their own situation. The three categories of qualitatively different ways of understanding how interaction in online forums can promote and support learning may be found between these two extremes of transactional distance. Furthermore, these categories reflect different forms in which learning interaction takes place; interaction between student–content, student–tutor, and between student–other students. A description of the categories and their sub-categories is given below. At the end of the section on each main category a concluding analysis for that main category can be found.

### 6.1. Learning in

For students in this first category it is the social aspect of interaction that is essential. Interaction takes place student– student. For this category of students the forum is a social environment in which it becomes possible to connect with others who are in the same situation as themselves.

“I felt as if I was in the classroom...”

“...is the only way we could interact and help each other.”

“In every school interaction with fellow students is good it enable you to know who others are taking the course, what they think and the problems they are finding...”

This category has two sub-categories that specify in which way this type of interaction supports learning.

#### 6.1.1. Affiliation

Interacting in forums give rise to experiences of connectedness and affiliation with other GIS-students in the course despite physical distance, and to an acknowledgement that others in the course have similar experiences to oneself.

“It seems that several people had similar problems to me...I'm not the only one...”

“In distance learning courses, it happens (most of the time) that the communication gap between students to students and between students to teachers occurs, and due to this, no student can ever assess the overall environment of a classroom, so the ambiguity prevails among the students. But the online forums helped a lot the understand the overall situation that the problem for example I am facing, I am not the only one who is facing and the other student's input and its solutions are the plus points which does not let one to felt someone alone.”

### 6.1.2. Supportive teamwork

In a distance education context without physical meetings, contact and dialogue in forums can lead to an experience of emotional support and a sense of security within the framework of the course. This embraces aspects of receiving and giving support.

“Many times in stuck in difficult situation where I found my self helpless, but these forums helped me a lot and took me out of this situation. My other fellows helped me a lot and took me out of that situation.”

“... I also found that I could be helpful to others.”

Students also reflect upon the importance of the supportive role for their own learning.

“It also helped me see issues from other people’s viewpoints not just my own. Thus broadening my understanding in the course.”

“Last but not the least, you don’t feel lonely learning GIS, since in a distance learning course, one feels that he/she only is facing problem and others are doing great. It leads to a sense of alienation and creates anxiety. But, through these forums, one finds out that others are in a deeper mess than one is in. It does relieve some of the loneliness and sense of being left out. Trust me for this, only students can experience it. Even otherwise, these forums are great ways to stay connected in view of spatial deprivation of different students.”

### 6.1.3. Concluding analysis

The transactional distance in a course is influenced by the degree of dialogue and structure. Within the category *Learning in the transactional distance* can be described as being moderately high. The students show weak learner autonomy and find the flexible context demanding since it involves the need to make a number of choices related to the studies. The students in this category shape and participate in a social and emotionally tinged dialogue in which they experience that they support and affirm one another.

## 6.2. Learning from

The distinguishing character of this second main category is that students regard online forums from the point of view of providing support for their learning without any active participation on their part in the form of questions, answers, ideas or problems. The students in this category learn by reading and taking part of what others have written in the forums of their own course and in forums from previous courses as well as. These texts function as content and the learning interaction is thus one of student–content.

“There were a lot of confusions during the course work about everything while I was proceeding. Then I started visited forums and most of the time I found my query over the forums either if it is a student's forum or teacher's forum. So due to this forum I solved a lot of misconceptions about the course and about management.”

The students that make up this category have distinctly different ways in which they make use of the contents of the forums for their own learning processes depending on individual aims and needs.

### 6.2.1. Content resource

The students interact with the material. To them the contents of the forums appears to be yet another resource along with the course literature and the instructional material produced by the teachers made available in the course. This content resource is used as a question bank in which they can rapidly seek answers to their questions as well as solve various tasks they have been assigned. They also use this resource if they are having difficulty solving practical or technical exercises such as, for example, a simulation in the GIS-software.

“I was able to learn from other individual’s expertise and difficulties. Some of the times I had similar difficulties that other students were having and I was able to learn from their response.”

“...when certain explanations given in the text (in the course literature [author’s comment]) are not very clear and you need some further explanation to be able to understand certain things.”

### 6.2.2. Instrumental study strategy

The students read the forums as an instrumental study strategy. They focus their attention on the contents of the forums in order to check their own understanding before they start to work with the material and/or afterwards put their own newly found insight in relation to the contents of the forum.

“In some cases, there are some mistakes that I have made without realizing them. So every time I checked the forums in order to see whether I have missed any question.”

“I must admit that I was not particularly active on forums. However, I always consulted them. I read the previous sessions’ forum to get better understanding of the questions...”

“I read them every day and know what sort of difficulties my fellow students are having...”

“...and as a full time student it was difficult for me to wait for the reply of my query in the on-line forum. But I can easily find the problem faced by the students in previous and their solution through the old forums and it was much helpful for me.”

### 6.2.3. Concluding analysis

The specificity of the category *Learning from* is that this group of students do not themselves contribute to discussions in the forum but they nonetheless feel they learn by reading them. These students do not participate in any kind of mutual dialogue with either tutors or other students. The flexible course design implies that students need to make several choices for themselves without any direct dialogue with their tutors. The choices are related to the content, order, and method by which they intend to work each stage of the course. This leads to a high level of transactional distance and the students that make up this category describe how they experience and manage this distance.

In the sub-category *Content resource* the contents of the forums act as a substitute content resource with which to interact as part of one’s learning process. The weak structure of the course is compensated by the experience that comes to the fore in the forum material as a substitute structure where the questions and answers of others serve as guidance for these student’s own studies.

In the case of the sub-category *Instrumental study strategy* the forum contents functions as a substitute dialogue in which certain students, by reading the questions and answers of tutors and peers, experience support and self-affirmation.

It is possible to trace students’ attitudes towards, and objectives with, learning within the category of *Learning from*. Some students see the role of “reading but not contributing” as the most strategic one in the flexible structure without personal contacts with other students, and thus they also use other students’ material in order to solve their own tasks. When the strategy is to only read others’ contributions in order to merely find the right answers to the tutors’ questions, an underlying superficial learning objective reveals itself. However, in the sub-category *Instrumental study strategy* deeper objectives reveal themselves with the capacity for meta-reflection about strategies of quality learning by means of reading and working on the contributions of others.

## 6.3. Learning with

This category describes learning networks in which students regard themselves as participants in a mutual process of knowledge construction together with their tutors and other students in the course. This experience emerges from active participation in the forums both as reader, writer, and thinking partner involved in problem solving, discussions and exchange of ideas. No matter what the students think they learn, they are sure that they grow in learning both by receiving and contributing in a learning interplay in the online forums. The form of learning interaction in this context is that of student–tutor, student–content, and student–student.

“I used the on-line forums such as message, instant message, and chats to communicate with teachers and fellow students whenever I had any problems. Teachers and fellow students were very helpful for explaining and discussing the issues that I raised. I also tried to be of help to fellow students as much as I could. This helped being confident in expressing what I learnt from the course...”

There are various aspects to the idea regarding what it is that students in this category learn together with others. On a level it is a question of learning in general and the exchange of ideas, but more specifically interaction here is subject oriented. There are two sub-categories with distinctly different ideas about who the *others* are, i.e. those who are regarded as important co-players in a particular student’s learning process.

### 6.3.1. Learning with other students

*Others*, in this sub-category, are other students in the course. The students mean that they learn from the interaction among equals, the equal status of fellow students.

“Interacting with other fellow students on our common course related problems was very helpful.” “Getting help as well as helping others has a positive impact.”

“The module forums gave more angles of how other people think. I also found that I could be helpful to other...”

“... discuss various course related and technical problems with fellow students”

Students also interact with others about GIS-content and/or about proficiency in managing GIS-specific software

“...on Cartography and Map projections. After carrying out some transformations my newly transformed map used to vanish. I couldn't see it and I didn't know what to do. When I visited the online forum, I noticed that other students were also battling with the same problem and through suggestions from others students in the forum, I was able to resolve that problem.”

### 6.3.2. Learning with a tutor

*Others*, in this sub-category, are *tutors*. This sub-category summarises the objectives of learning as the ability to take up suggestions from an expert, from the tutor, and search for the right answer. The role of the student as learner is narrower than in the preceding sub-category since the process of interplay does not include reflection and communication with any partner other than precisely the expert. The student initiates the discussion of a problem or a query, receives a reply and may thereafter continue to pose further questions to the tutor or perhaps content him/herself with the given answer.

“...able to get clarifications on, explanations about the exercises as well as guidance with some exercises. //...At one point I wasn't in a position to correctly interpret a question and was correctly advised by the teachers.”

“On the forum with teachers they were very helpful with answering technical problems related to using GIS, especially when it comes to just getting adjusted to the software. Therefore I think the dependence on the teachers forum will likely change during the continuation of the programme from technical support for using the software to more practical-oriented help.”

### 6.6.3. Concluding analysis

In the category *learning with* the transactional distance is low. Students govern their own choices by making many decisions with regard to content, time and working methods. Through motivation and achievement they take advantage of the freedom to choose e.g. opportunities for dialogue and communication with tutors and students alike while developing the roles necessary to manage the discussions in a manner that is meaningful to them. This provides them with a high level of learning autonomy since they themselves decide over and influence their study situation. They appreciate the asynchronous discussions and demonstrate a capacity for meta-reflection on their own learning and how it develops both by giving and receiving written feedback on their thoughts and reflections.

## Discussion

The results show that LUMA-GIS students have different attitudes towards, and objectives with, participation and various ways of interacting in the online forums. We believe we have been able to ascertain that the students, experience the flexible context of the course in different ways. This in part influences the ways in which they interact with one another in the online forums and in part what aspects of the interaction that has been meaningful to them.

Flexibility is the hallmark of IT-supported distance education which means that distance in space and time can be overcome (Collis & Moonen, 2001;2002). By means of a course such as LUMA-GIS, The University has been able to expand its territory. It is no longer merely a physical campus but also an expanded virtual university that can reach new groups of students. The flexible set-up of the course has made it possible for a large group of international students, all of whom possess a first degree and, in many instances, permanent employment, to partake in an advanced specialisation at Masters' level without needing to leave their families, working life, country, etc. for studies in Sweden. Rather, they have been able to combine studies with their present working, and life situations.

In earlier studies (Chizmar & Walbert, 1999; Song et al, 2004), students have appreciated flexible course setups as being of value. However, previous studies have also revealed disadvantages of flexibility and flexible learning from a student's perspective (Song et al, 2004; Howland & Moore, 2002). Similar results have been indicated in this study, namely that the flexible course context in the LUMA-GIS course has been experienced as having both advantages and disadvantages from a learning perspective in relation to the different ways in which the students experience this flexibility. It would seem that flexibility does indeed have its advantages but that these advantages have a pedagogical price in the form of lower pedagogical quality regarding the possibility for students to attain quality learning with depth, insight and understanding. This applies in a varying degree to category A: *Learning in* and category B: *Learning from* but not for category C: *Learning with* as will be discussed below.

In category A: *Learning in*, feelings of isolation emerge, along with a lack of a sense of belonging and being disassociated to tutors, students and the academy as a whole. Furthermore the students find it difficult to gain information and develop an understanding of the rules of the game in this extended virtual classroom. The transactional distance here is relatively high since the structure is low and the dialogue is relatively restricted. However, the interaction with other students that nonetheless occurs is found to be meaningful. The feeling of social and emotional kinship in student-student interaction is an important foundation for learning. The pedagogical price that is paid in category A: *Learning in* is that the interaction is too narrow from a learning perspective as it is not directed towards content knowledge. The student role that emerges in this category is that of "posters" although in a somewhat cautious and searching relation-building form.

In category B: *Learning from* the transactional distance is high. Students in this category do not participate in any dialogue in online forums, but rather develop and apply the strategic role of "lurkers" and, in so doing, experience the reading and usage of contents in online forums as an activity that is meaningful to them. They interact with the material that is the contents contributed by others to the online forums, partly in order to gain more structure as the course unfolds and, partly to use the material as a content resource for their own learning. In certain aspects the pedagogical price for this category may be classed as slightly lower than for the category A: *Learning in* since the interaction is only of the type student-content. Students in this category experience that they can search for answers to their own questions and learn while doing so. However, the contrary is also possible. The pedagogical price will be high in those cases when the student is primarily driven by a surface approach in which he or she merely reads and looks for the "right answer" in order to solve a task as quickly as possible.

Students in category C: *Learning with* set to work with the flexible context and participate actively as "posters" by both reading and writing in the on-line forum. They express feelings of self-reliance and ability to take responsibility for their own learning. Interaction in this category is well developed since it includes all forms, namely student-student, student-tutor, and student-content, and, furthermore it is primarily subject oriented. Due to the asynchronous delayed form an increased allowances for analysis and reflective depth in the dialogue is provided. The transactional distance is low which corresponds to students' experiences of a high level of learning autonomy whereby they are able to govern their own studies. Thus flexibility does not pay a pedagogical price in this category.

Against the backdrop of, and with support from, the theoretical framework, we maintain that the pedagogical quality is highest in the category of *Learning with*. It is characterised by learning interaction (Moore, 1989) in networks (Goodyear et al., 2005), in which the student's learning, insight and understanding may develop in a subject oriented dialogue (Du and Li, 2005), in a group where students with a variety of backgrounds contribute to the creation of a multi-facetted dialogue (Dysthe, 2002). Despite this, we nonetheless find category B: *Learning from* the most interesting. What surprised us most when analysing the data was that there were some students who, even though they did not make an active contribution to the online forum, still found them contributing to their learning. This does not apply to students who used them primarily "to get a free ride", but rather to those who clearly expressed a belief that online forums were important for their own learning even though they did not actively participate in them. This, for our part, unexpected way of successfully managing interaction aimed at learning led us to look up similar studies where concepts such as "lurkers", "posters" and "minglers" had been developed (Fåhrens, 2003; Nonneke et al, 2004). Hence, lurkers e.g. seem to learn from interacting with that which, in Moore's (1989) terms, is called "interaction between student and content".



Category B: *Learning from* has a sub-category that summarises the view of *Learning from* as being an *Instrumental study strategy*. Perhaps this is the most efficient time management strategy that an international distance learning student can assume in order to be able to combine studies with working life, having a family and a with a general mission in life! We base this assumption on Ramsden and Entwistle (1981) who have shown how students combine deep and surface approaches to studies in attempting to manage their own needs and motives in relation to the learning context. Ramsden and Entwistle have shown how these students strive for depth in understanding of the subject matter as such whereas at the same time they also choose to memorise that which they have reason to believe they will need to be able to reproduce in, for example, an examination task. The lurkers described in sub-section 6.2.2. have an instrumental study strategy and they make use of the online forums in their own learning process. They appear to strive for an in-depth understanding of the subject matter at the same time as they strategically manage their life and time as efficiently as possible. Their use of this strategy of *learning from* allows them to be minimally dependent on others and they need not 'waste time' waiting for delayed instructions, answers or feedback.

## Conclusions and recommendations

We would like to discuss the matter of introducing students to IT-supported distance learning. In our results (with regard to category A: *Learning in* and category B: *Learning from*) we find similarities with the results of Rovai and Wighting's study (2005). As the latter have shown, students need support and encouragement in order to develop a feeling of association and affiliation with others in the course. Thus, we believe that students ought to be offered the opportunity to take part in a special introduction when they embark on a course with a flexible design in IT-supported distance education. The introduction should aim to provide the students with the possibility of developing an understanding as to what studies in a flexible context might imply as well as facilitating for them to gain insight into which of their skills, attitudes and capabilities are likely to influence the outcome of their learning and studies – and how. Furthermore, the introduction could be particularly focused on seeing to that students are given support and encouragement to interact in purposive ways in the online forum so that they may learn and develop a feeling of association and affiliation within the course. The three main categories and their sub-categories might also present a way forward when advising course developers and higher education teachers on the relationships between aspects of flexibility, interaction, networking and meaningful learning.

The study offers ways of making sense of the quality of learning among LUMA-GIS students in relation to their need for flexibility, social context and structure. A possible improvement when it comes to networking for this heterogeneous group of students could be to encourage and facilitate the use of synchronous forms of interaction. Examples are different kinds of web 2.0 and social software technologies which have yet other potentials to form collaborative spaces for networked learning and reflective interaction.

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