New Methods for focusing on Students' Learning Process and Reflection in Higher Education

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Abstract: Among many studies about students' use of portfolios much focus is on assessment and the need to document learning processes in distance education, both from a teacher perspective. This paper focuses more on students' attitudes towards learning and learning process, **why** it is important, and it also introduces some methodology to support the students to bridge the responsibility gap that is experienced among new students at many universities. Responsibility is not only to focus on the result but also on the process, which students tend to neglect. Really shifting focus towards the learner, aside from proper methods and tools, is essential. We have implemented dialogue sheets as a method and tool for freshmen students, with the aim to create a positive atmosphere for peer learning where the focus is on the learning process. We encourage students to reflect upon why, what and how they learn to help them manage as life-long learners. The study has been performed at the Royal Institute of Technology (KTH) with the students at the Media technology program. The effect of the dialogue sheets is visible in students showing greater and better performance and participation in classes and in teamwork. Also an increased awareness and willingness to reflect is noted. The study made is important when understanding the fundamental mechanisms of the learner in relation to motivation and reflection. It can be useful when developing and implementing technological tools as support for reflection and learning process focus.
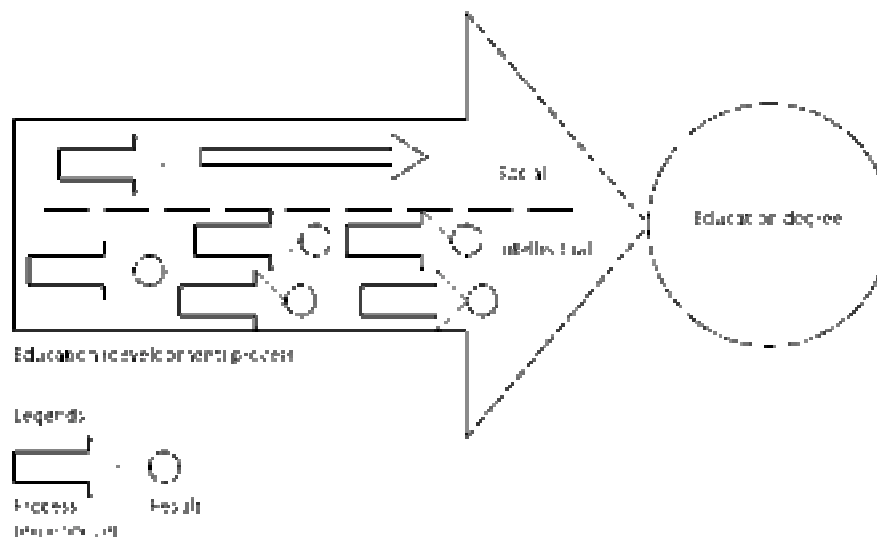
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Problem background

A guiding principle is that learning is a social activity. A university thus needs sites where students and faculty can meet in an intellectual, creative and stimulating environment. A university also needs proper methods and tools to support the activities in this environment, supporting a learner centric approach to education.

Generally, universities today are suffering from an industry-like organisation, where students are considered more like production units that need to focus on result and exams, than independent learners who can be encouraged to reflect upon what and how they learn. Many university students lack the ability to reflect upon their learning and learning processes. Partially, this is due to the lack of proper tools and methods for reflective thinking and partially due to the educational system (starting in the early years). All this is resulting in students focusing too much on their degree, i.e. a fragmented representation of their learning career, and too little on attaining new knowledge and their learning process.

Bowden & Marton (1998) argues that the future is, necessarily, unknown, and becoming more opaque, thus stressing the need to focus on what is at present, i.e. the process of learning (for an unknown future).

Figure 1: University learning process – processes leads to results e.g. passed courses. Informal and formal processes give experiences.
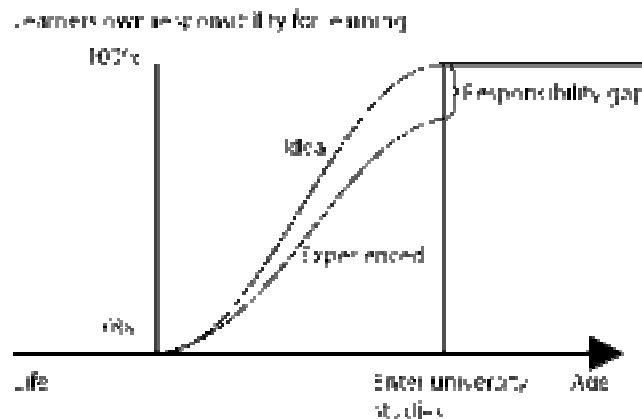
What is the consensus of the education? The sum of rings, i.e. results – a list of passed courses? Or, the sum of arrows, i.e. all experiences made during the studies, both formal and informal? The upper smaller arrows, within the large arrow – the total learning experience – represent informal processes, such as student orchestra participation and other social activities, and the lower smaller arrows represent courses. Note that courses have a formal result whereas informal processes generally do not. Students' education degree is often seen upon as the sum of all results (rings). If focus is on the results, the processes tend to be missed or even neglected.

Students go to university to develop, intellectually through studies and socially through different activities (actions, engagements, devotions, commitments). The development is a result of learning, which creates knowledge that comprises both facts and experiences, and is the

foundation for lifelong learning. But, students are not ready for the level of responsibility they are expected to take on, e.g. many students expect to passively be taught by the teachers rather than actively learn together with teachers and other students.

A student's time at a university can be divided into four categories:
Formal (i.e. time allocated for courses) scheduled activities, e.g. lectures.
Formal unscheduled activities, e.g. project work.
Informal scheduled activities, e.g. breaks.
Informal unscheduled (from a faculty point of view) activities, i.e. the rest.

Figure 2: The responsibility gap – a learners ability to take responsibility for his/her learning is supposed to increase during their formal training from pre-school to the time they begin their studies at a university, but generally the increase is not what universities expect it to be.

Teaching normally takes place during lectures, whereas learning can take place synchronously or asynchronously to teaching. Learning can also be an outcome of facilitation (methods and tools presented to the students) or of students' own initiative (peer learning). Normally learning takes place in one of the following student learning modes:
Performance
Group work
Informal social interaction
Reflection

Emphasising the above stresses the need for activities around community building, together with the creation of suitable learning spaces and proper tools and methods.

Today's students are the workers of tomorrow. They will need to better handle various kinds of information and information sources. Knowledge of how to produce information for different kinds of target groups and subject areas can contribute to a better awareness of information handling and retrieval.

The evolvement of the industry-like organisation has also led to a view that teaching has less status than research. Time teachers spend on research tend to increase at the expense of teaching. This means that students are getting less time with teachers, or at least less opportunity to interact with teachers when developing their own learning skills and profiting from classes.

The research field
This study is falling into the line of research and development of academic education such as:

Reflection as support to learning and self-coaching (e.g. Schön, 1983, Brockbank & McGill, 1998).

Reflection and documentation in portfolios as part of assessment by teachers (e.g. Hansen, 2000).

Reflection and documentation of processes to support distance education (e.g. Laurillard, 2002).

Learning communities as support for fulfilling society's competence needs (e.g. Shapiro & Levine, 1999).

The research in this study is more directed towards the learners' attitudes towards higher education, and methods to help the learners to improve them.

The study
The study group
The test group consists of all freshmen students at the media technology program at The Royal Institute of Technology (KTH). The program is now running on its' fourth year, and about 200 students in four yearly classes are following the program. A little more than 60 new students started the program in the fall of 2002 being the maximum number of students accepted each year. The program is a four-and-a-half year long program leading to a Master-of-Science degree. An additional, smaller test group, consisting of the freshmen Bachelors students at the three-year media technology program, is taking part of a smaller testing in conjunction with the larger group.

All scheduled interventions with the (larger) test group are primarily parts of a program summary course, with seminars and lectures about learning, learning styles, reflection, how to use different tools, etc.

Folio Thinking
The study is part of a project called Folio Thinking, which is a collaboration project between six test sites (research groups) at three universities in Sweden and the U.S.A. The project is funded by Wallenberg Global Learning Network (WGLN). The aim of the project is to develop a set of methods and tools for changing student attitudes and enabling reflection. All test sites have different focus, but a common denominator is the development and testing of electronic portfolios as tools supporting reflection. The KTH test site is focusing on the student learning process and methods for enabling studies of the same, and for reflection. At KTH, aside from what is described herein, different electronic tools are being tested, such as a conceptual browsing and modelling tool, and an electronic portfolio tool.

Method descriptions
In order to clarify the benefits and advantages of reflection, and giving freshmen students a good start in their academic years, we have introduced a set of methods for individual and group reflective thinking, and a set of tools to organise, model, structure and archive their findings and results, as well as their studies of their own learning process. With these methods and tools, we believe that students will become more self-aware and confident, i.e. more secure in their role as students, and lifelong learners.

The most significant method we are using is the dialogue sheet method. This method helps the students to adopt better attitudes to learning in general and to their own learning process in particular.

Dialogue sheet method (a table-top thinking and reflecting method)
A dialogue sheet is a method for creating a good dialogue within a group of 4 – 6 people. The word "dialogue" is used here to emphasise that a conversation is intended, in which all ideas are heard and respected. Argumentations and debates are not the goal. All is very much the foundation for teamwork and being a member of a learning community. Boud (2001) argues that much learning takes place when sharing experiences, knowledge and skills, as is the case in teamwork. The ability to work with each other and respect others' opinions is developed.

The method utilises the benefits of the dialogue when there is a need to constructively discuss important matters, such as learning, a new organisation, etc. It is also a base for formulating questions of their own rather than just answering others' and an enabler of critical thinking and reflection, as supported by Boud (2001).

The tool – the dialogue sheet – is a large sheet of paper (A1 or 70x100 centimetres) with pre-printed tasks and questions to work with and talk about, e.g.
> "In what way do you think that reflection can improve your learning performance in a) one month, b) three to six months, c) one year?"
> "What does it mean to carry on academic studies? Does it differ from earlier and other studies?"

All tasks and questions are equally distributed around the sheet, facing the participants, so that everyone get to "own" at least one task or question and take notes on the sheet, regarding what is being said.

Figure 3: Caption from dialogue sheet session with Media Technology students at KTH in August 2002

The "owner" reads the question out loud to the rest of the group and thereafter the conversation starts. It is not necessary to find a correct answer, nor is consensus needed, but it is important to write down the key words or solutions to the tasks and question. One important effect of the method is that **all** members participate in the conversation, everyone writes down important information, and they are all encouraged to write additional comments, ask

new questions or other information on the sheet. The owner can, if necessary, moderate the discussion so that all members may have their say.

Unified Language Modelling (ULM)
Conceptual modelling
The purpose of conceptual modelling is to help us disregard irrelevant structures by building relationships between idealised concepts that focus on what is essential. Efficient concepts disregard almost everything in a way so that it is noticed as little as possible. "The power of thinking is knowing what not to think about" (Naeve, 2002).

The KMR Group at KTH is developing a concept-oriented modelling technique called Unified Language Modelling (ULM), which is a dialect of the Unified Modelling Language (UML) – an international standard for information systems modelling that has emerged from the object-oriented programming and modelling community. The purpose of ULM is to visually represent how we speak about a knowledge domain. Having visual access to the history of a verbal presentation or discussion, renders it a permanence that greatly facilitates the conceptual calibration process (calibrating facts on a conceptual level when for instance negotiating) involved in the negotiation of consensus within a group (Naeve, 2002).

The research process
During the research process there have been several occasions for staff, students and business representatives to interact and participate in the development of the methods and tools. These occasions have offered a broad variety of methods to be evaluated and tools to be presented, as well as creating new solutions based on what has been experienced. This group has been pre-testing the methods and tools before the actual pre-testing with elder students at the media technology program. This active involvement of a variety of participants has established new relations within the university, and between the university and the business world. The faculty has also participated in the development process, mainly through interviews and informal discussions.

Evaluation methods
Course evaluation questionnaires
All students participating in the study group were asked to fill out a course evaluation questionnaire, in which they were asked to express their thoughts and comment on the dialogue-sheet method and on the modelling activities. The questions were open-ended to create more freedom of expression.

Interviews and discussions
Throughout the study we have conducted informal interviews with students, as well as with teachers. The teachers that we talked to were asked what they thought about this year's class and if they thought they could notice any differences in comparison to earlier years. The students were asked to reflect upon what they had experienced, including freshmen activities that are aside from the study but still believed to support the goals.

Initial findings
Students have expressed satisfaction with the dialogue sheet exercise. They think that there is a different view on learning and reflection presented to them than what they expected from a university. They have found most activities within the Folio Thinking project in line with what the dialogue sheet session started, but can to some extent feel that they are not used to these kinds of exercises focusing on reflection and learning process.

The general opinion on modelling and conceptual browsing is that it is a very useful knowledge for an engineer and a kind of primer in an engineer's way of thinking.

The teachers were also presented to the dialogue sheet method, but had a shorter session than the students. There are some differences though between students and teachers in attending a session. When students attend a dialogue sheet session both suspicion and anticipation is the two main feelings they bring along. The suspicion, however, generally fails to take the upper hand and more or less turns into curiosity. This may, or may not, be due to the fact that students generally do what the teacher or lecturer tells them to do, and that they are, to some extent, driven to higher education because of their inclination to learn.

Teachers, on the other hand, are generally open-minded but a little concerned that someone is trying to show that they have something they have yet to learn. Teachers also have reservations when it comes to using the dialogue sheet fully.

"It seems to me that someone has put in a lot of work when developing this beautifully designed sheet of paper. So, that it would be a shame to write outside the spaces where we answer the questions, more so would it be a shame spilling coffee or tea on it."

The quote above is from one of the teachers at the INSET in august 2002. If we compare this with the quote below from one of the student groups, when handing in the dialogue sheet after a six-hour (including breaks) dialogue session, we notice a major difference on the part of being open minded and creative.

"We don't have any stains from tea so we pulled out a tea bag and taped it to the sheet to balance all the coffee and soda."
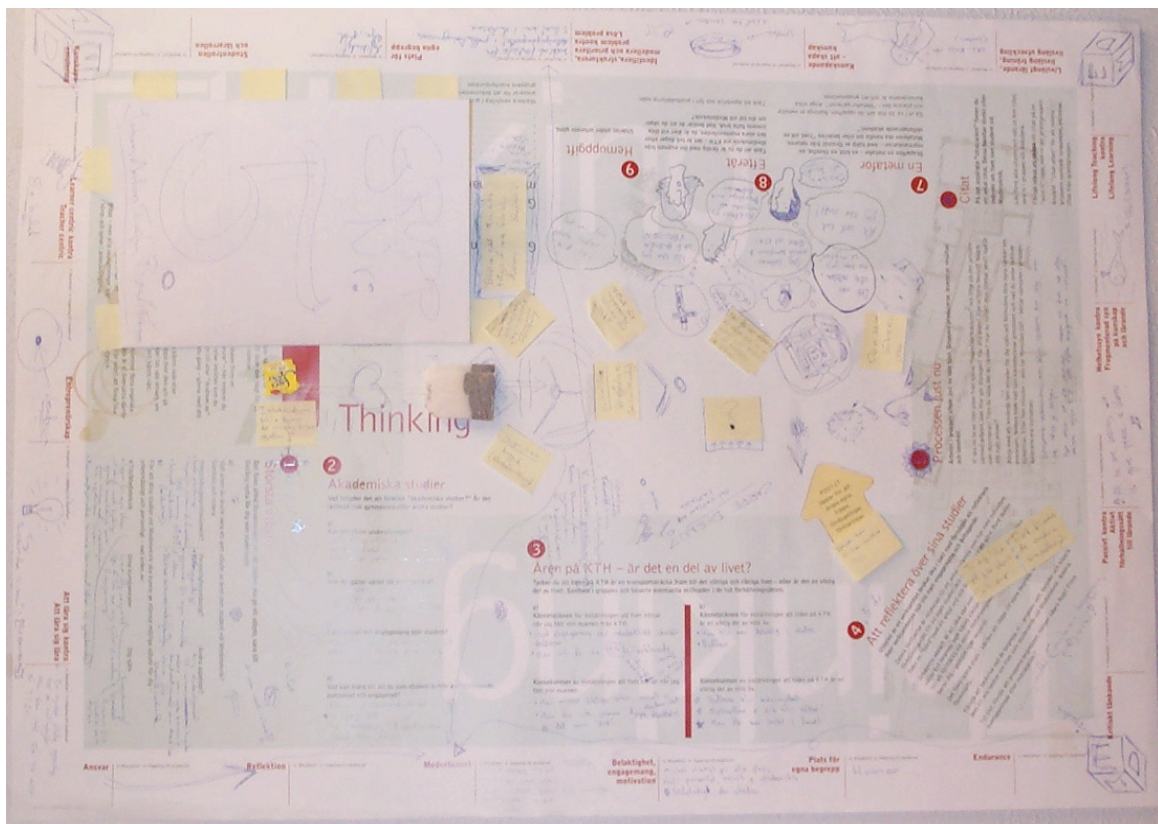

Figure 4: Dialogue Sheet from student session in August 2002

It may be needless to say that the dialogue sheet is full of remarks and sketches outside the areas where they wrote their answers to the questions (see Figure 4).

Students generally threw themselves into the action, their mission for the following four to six hours, perhaps even a bit too efficiently. Many groups stopped and re-discussed the questions after an hour's work, when they found out that they did not benefit from working at a high pace. Afterwards, some students said that they were struck with an insight that it is important to stop and think about what they are doing, why they have chosen to study at the media technology program, and that they will benefit from starting to reflect more on what they learn.

Teachers, on the other hand, were very moderate in their approach, and started to analyse why we had chosen a specific word or phrase in the questions. This led to less time for the mission at hand, but also to an interesting comparison of what different frames of references teachers have. Some found it strange to talk about how and why students learn, instead of what, and some the opposite – how good it is to finally start a dialogue on how and why students learn.

Both students and teachers said after the session that they thought this was a very useful method. They had learned a lot during the dialogues, and thought it could be useful in classes and for preparing younger students for important decisions – both the results of the dialogues and the method itself.

Students found this session useful for starting to find a balance between plain learning and reflection, i.e. for starting to reflect upon what and how they learn.

Lessons learned

Toynbee Wilson (2001) concludes in her study that it takes time and effort to prepare students to fulfil their role within a program and to maximise their own learning benefits from the process, which is evidence that actions cannot be singled out. Therefore it is important that the dialogue sheet method is not introduced solely, but as a part of a package of activities (i.e. using different methods and tools). This package needs to be well formulated for it to be manageable during periods of time pressure. It is also important to make the package adaptable to what may or may not occur after a few activities.

Not all recipients will find this method useful or may not understand the meta-perspective on the activity. In a large group there are always those who do not agree with the "authority", thus stressing the importance of not taking a teacher-centric approach to the activities, but rather a learner centric.

The social actions are depending on the forming and maintenance of a learning community. A learning community is depending on trust between students. The students' organisations and freshmen activities are important to establish learning communities.

Introducing new methods for reflection and learning process focusing will help students identify what they want to do in their life and why they have chosen to study a given educational program. We expect to see students that are confident in their purpose of attending academic studies, and that the dialogue sheets and the supportive activities are helping to pinpoint that

purpose. Furthermore we expect to see an increase in peer learning and a general improvement of attitudes towards learning.

Conclusions

Students should be able to model (using a standardised modelling language such as **ULM**) their immediate environment and their own learning process. When introducing metadata students should be able to organise and structure their material, knowledge and learning in electronic portfolios, connected to their models. The students have a greater self-awareness of what and how they learn, and they are engaged and are talking about all the fundamental questions on a more daily basis. Their focus is shifting from examination to learning.

All tools and methods used in this study will continuously be evolved and improved to better suite the purpose.

We will continue facilitating the establishment of learning communities, where students openly can discuss their learning and learning processes. Students are more interested in sharing experiences from different learning situations, and learning from each other.

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