

THE CHANGE OF THE TEACHER ROLE IN THE ERA OF NEW MEDIATION

Sergei Muchin¹

Abstract- *as knowledge, learning processes and pedagogical development in higher education become more and more related to new mediation (Digital Media), teachers are facing new processes associated to design, managing and assessment of teaching material. It seems like teachers of today partly have to set aside their role as traditional teachers and instead become designers of learning experiences and environments[1]. From being in the center of a traditional pedagogical process, teachers are more obviously just a small component in the complex structures of various interest groups in a university organization. By confrontation with information technology, digital media and the demands that new mediation has on a modern teaching organization, the intervention of pedagogical, economical and administrative aspects are now in focus. What are the experiences, thoughts and emotions in a teacher's mind when tradition and future development take place in their daily work? What can we learn from being part of design processes focusing on this change? This paper describes experiences from a multiphase collaboration project between the school of Electrical and Computer Engineering and Chalmers Medialab at Chalmers University of Technology.*

Index Terms –, design model, digital media, new mediation, teacher role, undergraduate courses.

NEW MEDIATION

In the history of human development artifacts and various media have always been part of knowledge development and knowledge transformation. Some of the knowledge we use in our daily life is considered to be tacit [2]. Other are presented as visible representation (books, pictures, etc) or as method and praxis. Digital media, ubiquitous computing and communication devices have changed the way people gain access to information and interact with one another[3]. As these technologies are changing our life situation they also change the way we understand our situation from a learning point of view. As technology has a direct influence on socialization[4], and construction of knowledge is part of a socialization process, "new media" must be considered as an important element in development of new pedagogical models. In the organizations of higher education this issue is a reality today, and it is explicit in the relation between students,

teachers and professors. This change is also important at the levels of strategic decisions and management for future development of higher education

The Faculty needs new models, techniques and strategies that can help them to adapt this new paradigm of teaching[5]. The use of digital media in education stresses the teachers' necessity to know how to use digital tools effectively and also how to produce teaching material in digital environments. The belief that the computer-literate generation of students will automatically adapt to and thrive in a technology-rich educational environment is a myth [5]. Especially, if teachers are still holding on to traditional methods of teaching, without concerning a changing media situation. It is also a naive belief that faculty will learn those new methods without an organizational, administrative and financial effort.

BACKGROUND

The content of this paper describes experiences from a three-year pedagogical development project. The reflections and analysis are based on several discussions accomplished under the development of digital applications. The reflections are also related to a series of interviews with six of the project managers (faculty members).

The aim of the projects was to investigate how digital media could be used in an efficient way. The purpose was also to develop knowledge of how to design for learning applications, to understand how new mediation have effect on the teachers' role and how Digital Media could be used in undergraduate studies at the School of Electrical Engineering at Chalmers University of Technology, Göteborg, Sweden. And finally, to identify what type of strategic effort from administrative and organizational perspective is needed, in the support of a development process.

In the fall of 1999, the School of Electrical Engineering, made a decision to introduce a group of projects, all in collaboration with Chalmers Medialab. The focused purpose of those projects were to give the faculty members a possibility to develop pedagogical tools using Digital Media, but also to develop the experiences of design processes where digital media is the format for mediation. At this time, Chalmers University of Technology, as many universities all over the globe realized that "new mediation" and the use of digital media would be an important part of pedagogical

¹ Sergei Muchin, Chalmers University of Technology; Chalmers Medialab, (Learning In Digital Environment), sergei.muchin@medialab.chalmers.se

development. The fast development of Information Technology did stress the reflection and analysis of the teachers' role in an era of new Mediation. The nature of education and pedagogical work seemed to have changed as new processes and styles were enabled[6].

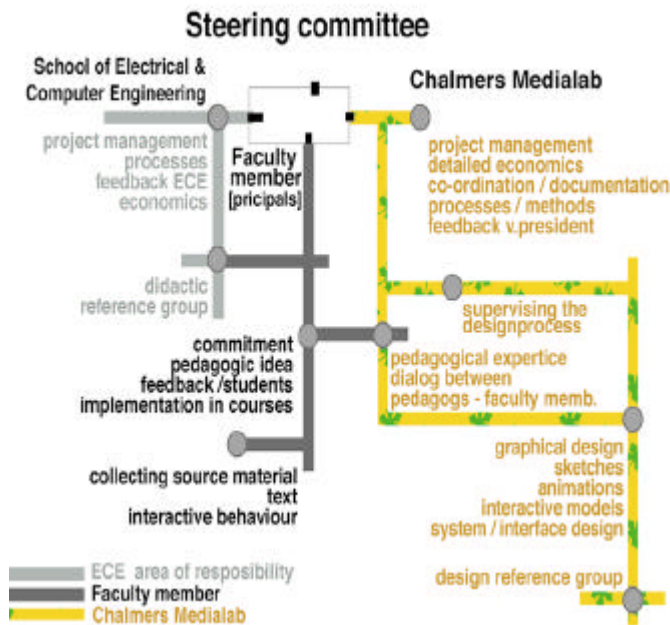


FIGURE 1.

PROCESS MODEL SHOWING RELATIONS BETWEEN DIFFERENT AREAS OF RESPONSIBILITY.

As a result of different trends in the area of Information Technology and higher education, the School of Electrical Engineering took an initiative to create a three-year development program (Information Technology in Undergraduate education). The participation in the projects was based on voluntary activities and was built on faculty initiatives. The projects were selected through a process where proposals were discussed by a steering committee. The project proposals were discussed from four main perspectives:

- What was the nature of the pedagogical idea?
- What was the prospect of the project to succeed?
- Was the idea built on realistic economical framework?
- Did the project show some original ideas?

The collaboration with Chalmers Medialab was associated to a group, focusing on the topic "Learning In Digital Environment" (LIDE). The team (1project manager, 1 graphical designer, 2 multimedia programmers, 1 interface and system designer, 1 webdesigner, 1 pedagogue and a project coordinator) was supervising and supporting the design groups established in relation to each project. The design groups were arranged as a professional team. The faculty member acted as the leader of the team and had full

responsibility for budget issues, content and regular feedback to the steering committee. The role of the participants from the Chalmers Medialab group was to act as professional members of the design team (all members did have experience from professional design activities).

In total thirteen project were launched under the period of August 1999 to December 2001. Eight of them were completed and they are now used in undergraduate studies. One project did end before it was completed (the steering committee did not find the project possible to be completed), and four of the projects are still under development, under new organization and economical circumstances.

THE PROJECT CONFIGURATION

The projects were launched in three different "generations". The first group (six projects, GEN I) was selected from thirteen proposals. The second group (four projects, GEN II) was selected from seven proposals; the third group (three projects; GEN III) was selected from five proposals.

The completed projects, which now are used in undergraduate courses, all derive from the GEN I and GEN II group. The reason for this was the existing time frame. The GEN III projects did not have enough time to come to a conclusion, but was still supported with the aim to develop preconditions (synopsis, draft and production plan) that could be used in further activities under a new organization.

The design model used was a commonly sequential process where each milestone (synopsis, pre-study, construction of draft, programming process, testing and evaluation) served as the checkpoint where economical resources were decided, and delivered. This model gave the steering committee a possibility to put pressure on quality aspects, and to secure a cost-effective process. In fact, when the existing timeframe for the projects ended, a quite large sum of the budget was unused (this was later discussed as a question of a good or a bad sign).

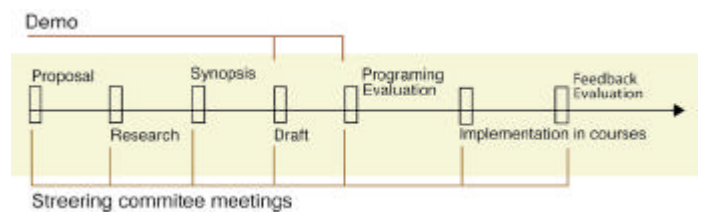


FIGURE 2.

DIAGRAM OF THE MODEL OF THE DESIGN PROCESS

The identity of the projects did show great variation. Even if almost all of the projects used some kind of web solution they were still presenting a variation in design and representation. The reason for this was the explicit pedagogical goals related to each project, and the need for course specific technical solutions. The web applications

were all part of hybrid learning models where student did participated in both traditional lectures, and via online distribution reachable both on and off campus. Two of the projects were built on local solutions where the digital material was distributed via CD-ROM. The reason for this strategy was to save the students' from network delays and waiting time related to the download (many students still used 28k modems from their home address) of graphical intense applications.

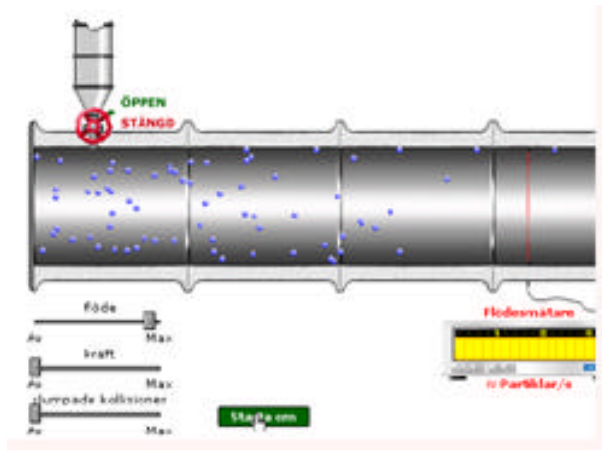


FIGURE 3.

"HALVBILD": A WEB BASED INTERACTIVE TOOL DESCRIBING DIFFERENT PHENOMENON ASSOCIATED TO SEMICONDUCTOR TECHNOLOGY

Some of the project aims were to find new ways of supporting huge groups of students. In those projects the focus was alternative formats of distribution and content delivery. In other projects the aim was to maximize time for exercises in laboratories. In this case virtual laboratories were built with possibility to use outside regular laboratory classes.

THE METHOD FOR ANALYSIS AND REFLECTION

The reflections and analysis of the projects are arranged into three main perspectives:

- The faculty members personal development as teachers.
- The general and overall experiences of Chalmers as a stead for pedagogical development based on new media.
- The pedagogical outcome and the results after the interaction between the pedagogical digital application and students.

In this context the first perspective is in focus but the second and the third perspective are also considered in the conclusion.

Analysis and reflections are based on a combination of ongoing conversations with all of the participating faculty members during the design process, and arranged interviews with six of the faculty members. The reason for the selection

of interview objects is the demand that the interviewees" selected for the interview should have experience from the whole design and implementation process, from the first initiative to a completed examination of students. At the time for the creation of this paper, only six projects fully fitted the profile.

The ongoing conversations and discussions were accomplished during meetings, in relation to quick tests of the application model and at coffee breaks or late night conversations. In the context of this publications that could be seen as circumstances for imprecise and disorderly information. But for people with experience of design processes this is a perfectly normal situation for communication and knowledge sharing during the process. Notes and references from the conversation related to the projects were saved with the purpose to collect information and material for the concluding report. The concluding six selected interviews were realized during the early spring of 2002. They were all taped and transformed to transcripts (all performed in Swedish).

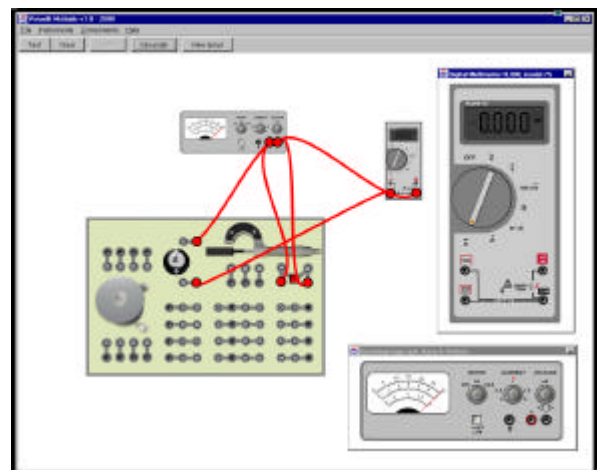


FIGURE 4.

"THE VIRTUAL MEASUREMENT LAB", SCREENSHOT FROM A FULL FEATURED JAVA BASED ONLINE LAB.

Some of the faculty members also participated in a video documentary where the projects were discussed with the vice-president responsible for undergraduate educational matters, and pedagogical expertise from the Department of Education at The University of Göteborg.

PERSPECTIVES ON THE TEACHER ROLE

In the ongoing conversations during the design process, three main topics occurred. The teacher's role – the emotional aspects of teaching and the feedback of the experiences achieved under the development of digital tools and applications. As a consequence the questions in the formalized interviews were all associated to the same topics. As the interviews were held in a dialogue manner, it

sometimes happened that the discussions on the topics, by association, drifted away to unforeseeable topics that still seemed as meaningful in the context.

The questions used in all interviews were:

- How would you describe your role as a teacher?
- How would you describe your experience of your role as a teacher before and after the project?
- What is your opinion on the relation between traditional teaching and development of new learning models?
- What type of impact did the use of digital media have on your role as a teacher - before and after the project?
- Does "new media" have any part in future development of your role as a teacher?
- What type of individual support do you need in your future development of your role as a teacher?
- What type of feedback does your experience from the project generally achieve?
- What type of formalized feedback is the result of your project?
- How do you experience the support from management levels of the university?
- Do you have an opinion on the relation between resources and future development focusing on a "new role" as teacher?
- How will you use the experiences from this project in future activities as a teacher?

Generally the teacher's view of the teacher role was a reflection of a traditional model, the teacher as a lecturer, mediating knowledge through the "transfer metaphor"[7]. But this traditional way of teaching also seemed to be in a shift to a more supporting role as supervising discussion partner.

Some of the interviewees described their role as a quality guarantee for the industry. They support the level of knowledge supposed to be related to the industry standards and the industries need of specific knowledge. In such a situation the teacher acts as the "safeguard" for this level of quality.

Not one of the interviewees' did spontaneously include course administration, design of teaching material or course budget planning into the teacher role. This self-perspective could be seen as surprising. After discussing the administrative perspectives of the teacher's role it became clear that a large part of the teaching activity was associated to administrative and organizational aspects. One of the interviewees described the administrative aspect as a central part of the profession.

All of the interviewees' did experience difficulties in the role as developers of new learning models. The resources, represented as time and money, constantly seemed to be undersized. Development of pedagogical models and course related material often seemed to be reduced to private time. Development of traditional material

into its digital equivalent or digital version seemed to be organized in incidental projects, without any organized feedback and did not occur in ongoing long time programs.

Not surprisingly, the interviewees generally felt more comfortable using traditional media when preparing lectures, but after being involved in the design process they quickly understood the possibilities and the potential with "new media".

A majority of the interviewees expressed the experience that the development project and the close relation to the design process of learning material, using digital media, changed their way of thinking of pedagogical issues. It also changed the view on their role as engineers. Today, engineers have the possibility to use tools that just a few years ago were extremely expensive and seen as a specific resource. They felt that the use of computers is rapidly changing the profession and role of the engineers. This change also seems to have an effect on what and how the students learn.

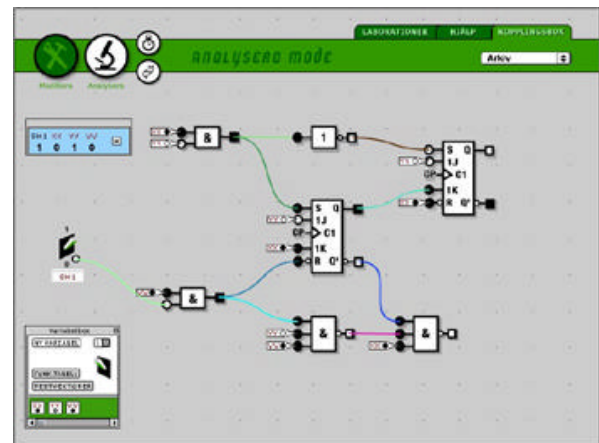


FIGURE 5.

"DIGIFLEX", A COMPUTER SIMULATOR USED IN COMPUTER TECHNOLOGY COURSES.

At the present time computers are natural parts of the learning environment. As a result, teachers' need to learn how to use new media in the learning situation. The interviewees experienced a need for a discussion on how digital media could be used in an effective pedagogical way. Some of the teachers meant that digital representation of knowledge could give the knowledge-community of engineers a new level of understanding, and possibility to communicate this knowledge.

When discussing the personal needs for development, the interviewees spontaneously mentioned "feedback" as the most important stimuli for development. Evaluation from student, pedagogical expertise and discussion among colleagues seemed to be necessary for qualitative development.

The feedback on the projects was generally interpreted as poor. On an institutional level collegial discussions and seminars seemed to be the most frequent format for feedback. Creative critique, evaluation and reflections on the projects seemed to be a most important stimulus for qualitative development.

The lack of organized feedback on higher levels seemed to create obstacles for a cost-effective use of the knowledge, and the result achieved from the projects. As the development of digital media material used in courses is an expensive activity this obstacle seemed to be contemptible.

The interviewees' opinion on the relation between resources and future development of a new role seemed to be pessimistic as Chalmers University of Technology, as many other universities, has economical problems. But still, the general belief and hope among them was that as soon as Chalmers solved the economical crisis long-term programs for development into a university using "new media" would probably appear quite soon, to a greater extent. If not, the interviewees' expressed a warning, Chalmers would soon be behindhand in the global change in higher education, and end up as a less attractive knowledge organization.

As a result of the projects, the interviewees did have plans to work with further development of the digital tools. In such a process interaction with students are essential for quality guarantee and a successful progression of new ideas. Close collaboration with colleagues, inside and outside of the university also seems as an important source of experience and knowledge relevant for a successful development.

Finally, all the projects, which were completed and did have a period of interaction with students, were described as joyful, stimulating and fun to be part of. Even if the projects did use private time the interviewees' felt that this was relevant and necessary for personal development. Even if the reactions from students still are not scientifically proved as an achievement of higher pedagogical quality, the interviewee's reflections of examination results and by "word of mouth" evaluation, is that the digital tools, used in their classes, gave the pedagogical situation a new quality and positive reaction.

REFLECTIONS ON THE RESULTS.

After being part of this three year long project my personal reflections have been under constant progression. The striking impression, from my perspective, is that teachers are not aware of their complete role as teachers. They generally seem to divide their activity into two main parts. The teaching, and the administrative part. Few of the faculty members spontaneously described themselves as designers of teaching and learning experiences. They seem to look upon themselves as servants or controllers in a teaching situation, not as creators.

Few of them saw design of a learning experience as a main part of their role as teachers. Some of them even had

the opinion that it was not necessary to associate teaching and design of teaching material in their role as teachers'. The same teachers' could still emphasize the importance of a new role as supervisors, discussion partner and coach in the learning situation. This role is, from my point of view, an activity that also includes design of a learning experience.

It seems strange that administrative and organizational aspects were not interpreted as part of the teacher role, even if those areas were a major and time-consuming activity.

Every learning experience need some kind of material, traditional or digital, which means that when striving to create a coherent learning experience from both cognitive, practical as well as social perspectives, the role as a teacher and as a designer of learning material should be related to one another. The administrative aspects should also be included in this view. Digital tools for course administration are common, but are spontaneously not seen upon as a learning material.

Some of the interviewees felt that in future activities as teachers it is of most importance to develop knowledge on how to design teaching material using digital media. This is a critical reflection, even if economical and organizational aspects do not support this point of view on every level.

A general reflection after being part of all those projects are that a lot of the experiences and knowledge is unused today, all because there is no relevant forum for feedback and discussion. Even if the university is striving to be part of the growth and change into a new era of pedagogical mediation, organizational and administrative traditional aspects still seem to be part of the obstacles for an effective update of pedagogical methods, and a new teacher role.

CONCLUSION AND SUGGESTION FOR FUTURE ACTIVITIES

As a result associated to the collaboration projects between The School of Electrical Engineering and Chalmers Medialab, a new department (Center for Digital Media and Higher Education; <http://ckk.chalmers.se>) is formatted. From April 2002 the mission of this center is to focus on digital representation in higher education. The purpose is to support a new overall perspective where all the disciplines at Chalmers University of Technology will have the possibility to develop digital media teaching-tools for education. A second important purpose is to give the faculties practical possibility to learn how to produce and use digital material.

The suggestion of this paper is that organizers of, and participants in similar projects, should use some of the experiences from this project as guidelines, to give further development projects a possibility to succeed. The following statements conclude the experience of the project.

- As digital media, unlike other technologies, permit an almost limitless array of functionality and variation in usability, learning organizations will gain quality by

establishing long-term programs for faculty development into a "digital- literate" tradition.

- To succeed, this must be confirmed and directed from management levels, in close collaboration with departments and institutions.
- As a strategy to create a cost-effective environment for pedagogical development universities must show the ability to use experience from different development projects, and create a forum for collaboration between different projects and disciplines.
- Improvement of educational material should be considered with high status in the educational system. This should be visible by allocation of resources and active strategies with the aim to support the faculties in the development into a new teacher role.
- Coordination and use of software tools, and methods for design must be established between different technical disciplines.
- As the design of digital media-tools is a complex structure and a mix of different disciplines interacting with one another, knowledge from the disciplines of humanities is an important and useful part of the design processes. Collaboration over disciplinary borders must be supported from management level.
- Digital media is not only applicable in the learning situation. It is also important to understand that new media have an influence on administrative and organizational aspects, which is a large part of teachers' daily work and included in the teacher role.
- As media (all types) always exists as part of a learning environment, a forum for an ongoing discussion on how to use media in the most efficient way for pedagogical results and cost-effective way must be established. This discussion should be formalized and focus on a the relation between media and higher education.
- A striking experience from the projects were how easy it was to get "home blind", and how fast the lost of "touch" of the actual learning experience appeared. Because of that it is necessary to have groups of students participating in evaluations, and as advisers during the whole design process.

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