

New and Changing Teacher Roles in Higher Education in a Digital Age

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ABSTRACT

Digital tools are increasingly being used to support teaching in higher education. These tools place new demands on the tasks and responsibilities of the teacher, and can influence teacher roles. In this study we investigate the long-term use and development of a tool for facilitating the negotiation of meaning in argumentative student texts, through teacher and peer feedback. From this setting new teacher roles have emerged.

Keywords

Teacher roles, Higher education, Communities of practice, Teaching-learning environment, Digital tools

Introduction

Teacher roles are acted out in concert with the conditions and characteristics of a *teaching-learning environment* (Entwistle, McCune & Hounsell, 2002). The conditions for teaching in higher education in Norway and elsewhere are being increasingly influenced by the use of digital tools for pedagogical purposes, and governmental strategic planning documents express high expectations about the positive effects that technology will have on teaching and learning (Norwegian Public Reports, 2000). The research reported in this paper explores the consequences of this development on teachers roles, specifically how a digital tool embedded in a context for teaching in higher education contributes to changing the conditions for teaching and the roles of the teachers.

Our study investigates a traditional disciplinary culture where a digital tool has become embedded over an extended period of time, and is now fully integrated with the teaching-learning environment. The digital tool is Kark (<http://kark.uib.no/>), a net-based tool for writing, feedback and discussion. Kark was developed within the Department of History at the University of Bergen (UiB) as a solution to a concrete problem, with specific pedagogical ideas in mind. The main aim was to facilitate the negotiation of meaning in argumentative student texts through teacher and peer feedback. Our approach is to view the teaching-learning environment as a community of practice.

The data presented in this study was collected at the department at the UiB for two separate research projects, the Kaleidoscope IMPACT-project (<http://www.noe-kaleidoscope.org/pub/activities/activities.php?act=30>) which aimed at investigating how the introduction of technology in the classroom in higher education changed the role of the teacher (Oliver, et al. 2005; Price & Oliver, this issue), and the Digital Portfolio project (Dysthe & Tolo, 2004; Dysthe & Engelsen, 2003), which aimed at investigating how digital portfolios changed the conditions of teaching and learning in higher education.

Theoretical perspective

Sociocultural perspectives on learning, which focus on knowledge and learning as social, situated, distributed, mediated and on the centrality of language (Vygotsky, 1986; Wertsch, del Rio & Alvarez, 1995) form the basis for

this study. We have chosen to view the Department of History as a *community of practice* (Lave & Wenger, 1991; Wenger 1998) where there is *mutual engagement* by all the academic and administrative staff in the *joint enterprise* of teaching students the disciplinary content knowledge and acculturating them into the ways of thinking, talking and writing in the discipline (Wenger, 1998, p. 73). While students are often seen as the object of teaching, from a sociocultural perspective students are regarded as peripheral legitimate participants in the same community of practice. In this view of learning, mastery resides in the way the community of practice is organized and how the learning resources are structured. Learning is an aspect of the enculturation into the disciplinary culture (Lave, 1996). At the Department of History, Kark and the digital portfolio are the new mediating artefacts or tools (Wertsch, 1991) that are used for this purpose, in addition to the traditional cultural tools, for instance lecturing and mentoring. These tools are important elements of the *shared repertoires* (Wenger, 1998, p.82 ff) in academic disciplinary practices, as they strongly influence the changes in routines and ways of doing things in this particular teaching-learning environment. The shared repertoires are resources for the negotiation of meaning, and in academic communities of practice this negotiation, as well as its product, is very often text based. This is also the case at the department, where Kark was specifically designed as a tool to facilitate the negotiation of meaning in argumentative student texts through teacher and peer feedback.

The teacher roles are embedded in a teaching-learning environment, of which the digital tool is a partial constituent. Several interrelated aspects constitute these environments, and thus are part of the conditions for carrying out the role of the teacher. Fjuk and Ludvigsen (2001) give examples of the aspects that can be seen as forming the poles for interconnections in a distributed collaborative learning environment:

“... theories of learning and instruction, subject domains, teacher’s roles, delivery institution’s educational praxis and tradition, organisational and administrative arrangements, costs, properties of ICT (information- and communication technology) and available software, geographical distances between co-learners, etc. Any changes associated with one of these aspects will inevitably *influence* and *change* the others.” (Fjuk & Ludvigsen, 2001, p. 237, italics in original).

Many of these elements are relevant to the teaching-learning environment at the Department of History. Changes in teacher roles can be attributed to more than one factor, and we may expect that a change in one of the elements, for example the digital tools that are used, will also affect the teacher roles.

Research focus and methodological approach

Research focus

A preliminary version of Kark was introduced at the department in the early 1990's. Initially the tool was mainly used by the 'enthusiasts' as well as the instructors who were employed particularly to deal with the administration and development of Kark. Gradually, however, the use of Kark has had implications for the entire teaching-learning environment, has involved an increasing number of the teachers, and affected everyone employed in the department. It is therefore a suitable site for studying the teacher's role. Our overarching research question is:

How has the introduction of the digital tool Kark changed the role of the teacher in the Department of History?

In order to answer this question we focus on a number of more specific questions:

- To what extent and in which ways has the use of Kark changed the traditional practices and activities of professors and lecturers, and what new aspects are added to their work repertoire?
- To what extent has the introduction of Kark resulted in task specialisation related to individual members or groups contained in the community?
- What practices and activities do the new roles include and to what extent do they overlap or supplement the traditional teacher roles?

Methodological approach

Our theoretical perspective and the nature of our research questions calls for a qualitative approach. Data was collected from two main sources, interviews and the study of textual artefacts. We interviewed teachers (professors,

lecturers and teacher assistants), the system programmer, and support staff. A semi-structured interview guide directed the interviews, which were recorded and transcribed before analysis. We also studied the tool in question - Kark.

We carried out nine interviews with seven professors and lecturers, five interviews with three administrators, and one interview with four teaching assistants. Additionally, we carried out one interview with UiB central staff, where the person was the leader of the implementation of a virtual learning environment. Quotations in the following text are numbered and coded according to the role of the interviewee and the date that the interview took place.

Having presented the theoretical perspectives that informed the study and the methods used in collecting and analysing the empirical data, we will contextualise the study by a brief description of the Norwegian higher education scene and the Department of History. Because of the crucial importance of the digital tool we have chosen to outline the historical development of Kark as well as provide a description of how it is currently being used at bachelor level. Finally we will present and discuss the findings from the empirical study in light of our theoretical perspectives.

Contextualisation of the study

Higher education in Norway after the “Quality Reform”

The recent major reform of Norwegian higher education, called the Quality Reform, was strongly influenced by the internationalization in the higher education sector in general, and the Bologna Declaration (European Higher Education Area, 1999) in particular.

Norway, although not a member of the EU, has been in the forefront of implementing the Bologna principles (Bleiklie, 2005). Formally introduced through the White Paper 27/2001, the reform is comprehensive and represents an attempt to achieve a higher degree of efficiency through devolution of authority to the higher education institutions, the provision of stronger leadership, improved pedagogy, an increased emphasis on internationalisation, and on the formation of an agency for quality assurance and accreditation (<http://www.nokut.no>).

The Bachelor/Master study structure (3+2 years) was implemented at all levels of Norwegian universities and colleges in autumn 2003. The new study structure represents a radical break with many of the traditions in Norwegian higher education. It affects the structure and length of undergraduate and graduate studies, our assessment system, teaching, supervision and student learning. Students now get their Bachelor's degree in 3 instead of 4 years, the new credit point system (in line with ECTS) is introduced, and our grading system has changed from a very detailed numerical scale to a letter scale (ABCDEF). All courses are modularised (most courses are 10 or 15 ETC) and the use of external assessors of undergraduate courses is reduced. A preliminary report (Michelsen & Aamodt, 2006) from the evaluation of the reform shows that it has had considerable impact on teachers and students. The new assessment forms, digital portfolios for example, have led to an increase in focus on student feedback, and an increased emphasis on passing students “through the system” more rapidly.

The Department of History, University of Bergen

The department is one of the largest in the Faculty of Arts, with 700 students - 550 at bachelor level, 150 at masters level, and 14 PhD. Students; 24 professors and associate professors; and five administrative positions.

Teaching has a high status at this department. This is not self-evident, because traditionally research has had a higher status within academia. It received “The Evaluation Award” from the government department Ministry for Church, Education and Research Affairs in 1997, for “*goal-oriented, systematic, student assessment over time*” (Ministry for Church, Education and Research affairs, 1997). Student evaluation of teaching at DH (student-feedback on courses) is driven forward by the academic staff, and not the administration, as is often the case. Our interviews with the teachers at the department reveal a genuine interest in the students' development as academics. It is not surprising that Kark was developed in this environment.

Kark – the pedagogical thrall

Kark is written in the programming language Delphi, and is implemented as a web application that runs on a server, with a web-browser user interface. Its basic functionality is to allow a user to upload a text document to a database, format it to html and make it readable to an Internet browser upon (authorised) request. It is primarily an online tool for writing and discussing, developed within the context of the department with a pedagogy of *learning through writing* in mind (Oldervoll, 1996).

Kark consists of two main tools, Kark Essay (KarkEssay) and Kark Discussion (KarkDebatt). Additionally there are a number of subserving tools often associated with learning management systems (LMS) such as resource-pages, calendar, presentation-system, dictionary, chat, evaluation tool and functionality that supports portfolio assessment. In Kark Essay (see figure 1), the teacher can give assignments (a), read texts that the students upload and give feedback on (b). Students can also comment each others work. Kark creates a log that gives the teacher version control over the students' texts and peer/teacher comments for the portfolio assessed courses. The log is available for teachers, administrators and external examiners. Kark also creates a folder in which the students can keep track of their own work.

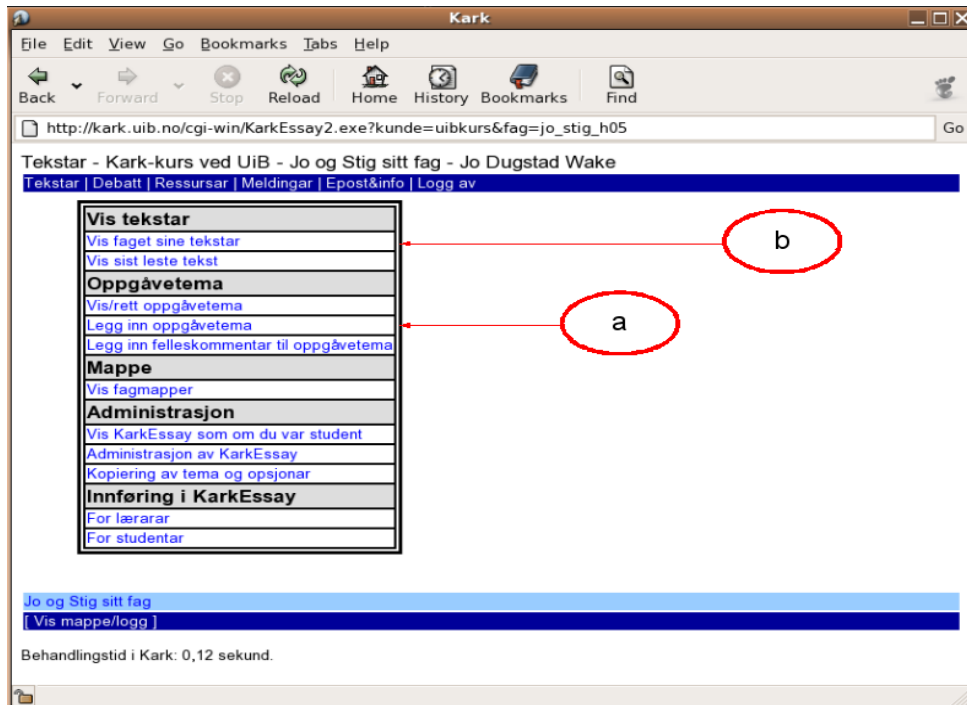


Figure 1. Administrator view of Kark Essay

Figure 2 illustrates both a teacher (a) and a student (b) commented assignment in Kark Essay. The comments appear “inside” the text, and can only be made on paragraph-level. The grey fields (c) allow the teacher or peer to display or hide comments to the text, displays the theme and version of the assignment, and who wrote it and when. The paragraph in italics (d) is resource material for the text. The following paragraph is the first paragraph in this student's text (e). The pencil icon (f) at the end of each paragraph invites the teacher to add comments to the paragraphs. Having commented on one of them, a hammer icon will appear next to it, inviting the commenter to amend the initial comment if desired.

Kark Discussion (see Figure 3) is an online discussion forum. Themes and questions raised in the lectures, or other issues of interest are discussed here by students and teachers. The teacher often takes a leading role in the discussions. This illustration only has one discussion thread, but Kark Discussion averages 2-3000 postings during a

semester. It displays the discussion threads by title (a), author (b), last viewed (c), amount of replies and how many times it has been read (d).

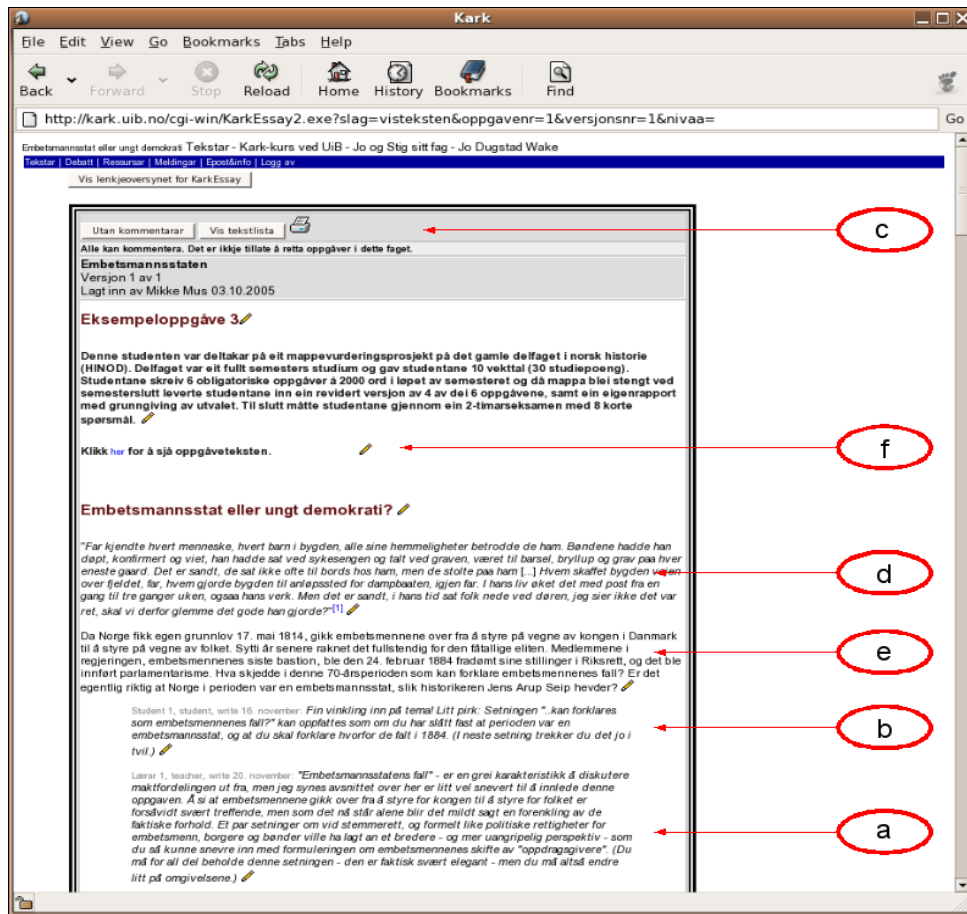


Figure 2. Commented text in Kark Essay

The Development of Kark

Kark evolved from face-to-face writing seminars for bachelor students at the department. The overarching goal was to facilitate student writing and teacher/peer feedback to an increasing number of students, based on a pedagogical conviction that the activity of writing is vital to deep learning, that is learning as critical understanding and thinking.

The main circumstance behind the development was that student numbers at the department, and UiB in general, doubled between 1987 and 1993 (Larsen, 1996), a situation that was very demanding on teaching resources, particularly the writing seminars. There was also a high exam failure rate, paving way for the common understanding that “something had to be done”. Two other circumstances were also relevant. Kark's developer had already participated in a history-specific system development project, through digitalising the results from the first Norwegian national census carried out in 1801, thus displaying both motivation for and capability of developing digital tools for scientific purposes. Also, the then named Norwegian Ministry for Church, Education and Research Affairs funded a pilot project, the Absalon-project, where the tool could be tested in the bachelor program at the department.

The two main pedagogical goals of the Absalon-project were to increase the amount of compulsory student writing, and to provide feedback on the written texts. Writing assignments was tied closely to the lectures, as the students were to compose short summaries of them. The activities included peer and teacher commentary of the summaries.

For this purpose, a simple writing tool (Absalon) was developed. Oldervoll (1996) calls it an outlining or “text-structuring tool” (p. 233). The tool generated hypertext from the students' texts. In order to facilitate sharing of the texts, the HTML-formatting tool Kark was developed. Kark stored the written texts in a database, and made it readable to a web-browser. It also stored teacher and student comments. No scientific evaluation of this particular intervention has been made available, but only one of the 200 students who took part in the project failed the exam (Oldervoll, 1996).

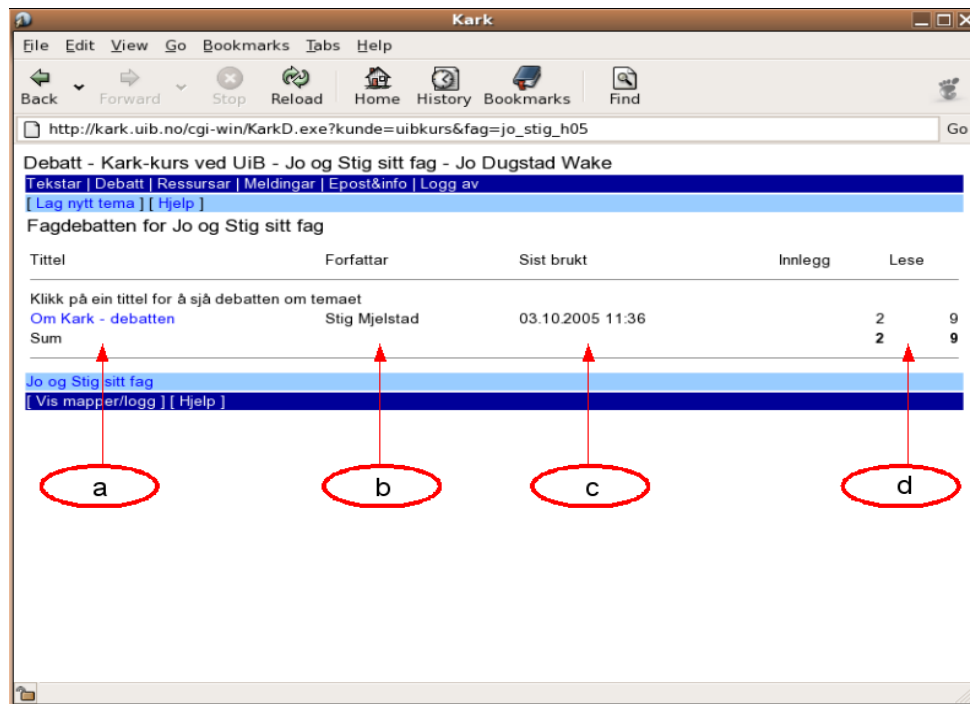


Figure 3. Kark Discussion

The experiences from the Absalon project provided a basis for the further development of the use of Kark, with its focus on writing and peer/teacher feedback of text (Oldervoll, 2003). Until 2001, it was only used as a digital continuation of the previous face-to-face writing seminars, and as a discussion forum for the individual courses. The following sections are dedicated to a description of how Kark is currently being used.

The use of Kark at Department of History

How Kark is used in the teaching at bachelor level depends on the particular course. There are two forms of assessment: traditional written exam and digital portfolio assessment. Kark is used in courses with both examination forms, but more extensively in the digital portfolio courses.

Written exam

In courses with written exams, Kark Discussion is used to facilitate a discussion that lasts throughout the semester. A broad range of topics are encouraged in order to increase student interest in participation, and teachers take a leading role in these discussions, providing topics for debate and input to the debates. Thematically, the teachers deliberately keep the discussion open in nature, as a catalyst to keep the discussion going.

Kark is also used to deliver, receive, and give feedback on a mandatory assignment early in the semester. The objective is to weed out students that do not plan to take the exam; students who do not hand in the assignment are

removed from the course. Also, the Resource tool in Kark can be used for sharing lecture notes and handouts, links to web-pages and so on.

Digital portfolio assessment

Digital portfolio assessment was introduced to higher education in Norway with the “Quality Reform” (Tolo & Dysthe, 2004). Department of History tried out portfolios in 2001, and made it part of an ordinary course module in the autumn of 2002 (Oldervoll, 2003), and it is now one of two regular assessment forms at the bachelor level. Kark, with Kark Essay and version control functionality (log) already in use at this point, represented very apt means to implement the portfolio assessed courses at the department digitally, and was thus more than an indirect cause of the decision to try out digital portfolios.

Kark mediates the writing and commenting of argumentative texts in the digital portfolio assessment courses. Students write three assignments that are submitted as their portfolio at the end of the semester, and together with a small written exam they serve as the basis of assessment. The two hour written exam covers the span of the curriculum, and has mainly a control-function, to prevent students from handing in someone else's work. Each student is also required to comment on two fellow students' work. This is carried out asynchronously, and the pedagogical rationale is that students learn more when they act as teachers. Feedback from the teacher or teacher assistant is dependent on peer feedback being posted first. All comments are visible to all students registered on the course, and to all teachers at the department. The student is expected to revise, but interestingly, it is the first text version that serves as the main basis for the grading.

Findings and discussion

Overview

In this section we first describe the changes in the traditional teacher role of the professor and lecturers. While these changes are clearly identifiable, they do not fundamentally alter the teacher role – they are changes within the traditional activities and practices of a higher education teacher. We choose to call this role the *Traditional Teacher*. It is a composite role, where lecturing has been a major part together with supervision and mentoring. One of the most important findings in this study, however, is the need to differentiate the concept of the teacher in the traditional understanding of the term. As a result of the new medium and the new way the courses are structured, task specialization has become inevitable. In addition to the traditional role of the lecturer we find two new teacher roles, which we call the *Writing Mentor* and the *Orchestrator*. The primary task of the *Writing Mentor* is to give students feedback on texts, i.e. the submitted assignments in the portfolio assessed courses. The *Orchestrator* carries out a synthesis of functions; administrative, pedagogical, technological and liaison. These roles will be described more closely in the sections below, focusing on what the persons do, whether and how they are trained, how they cooperate with others in order to carry out their functions, and how the new positions have developed within the university system. We then discuss the changes in light of our theoretical perspective and concepts, particularly the importance of the different roles in utilizing the mediating functions of the digital tools and thus creating new, shared repertoires in this particular community of practice.

Changes in the traditional role of the traditional teacher

Lecturing has always been a central role of higher education teachers. The introduction of Kark and digital portfolios has not resulted in a reduction of lecturing, but has focused its purpose to provide students with historical overview and connections: “*Digital portfolios are just one aspect of the total teaching-learning system. Lectures are not redundant, on the contrary, survey lectures is a vital element*” (Extract 1, Teacher C, 03.10.05). Because the courses are now structured by portfolio assignments, there is a recognised danger of fragmented knowledge. The danger arises as the overview-giving lectures “competes” with the students' attention regarding the successive submitting of written assignments on which they are graded. Other aspects of the traditional role have gained new importance: “*Making assignments has become more important, because assignments direct student work to a considerable degree. Students immediately confront us with weaknesses or inconsistencies in formulation*” (Extract 2, Teacher D,

02.06.03). The role of Kark as an agent for change in this respect, is a matter of paving way for a new teaching method, rather than affecting the teacher role directly.

Giving feedback and guidance to students is also a traditional aspect of the teacher role, but the interviews revealed qualitative changes in the activity itself that was directly attributed to the use of Kark. The difference between face-to-face feedback and electronic feedback was a theme in the interviews: *“I have to be more careful in the way I formulate critique since I cannot elaborate on what it means in oral conversation with the student”* (Extract 3, Teacher B, 30.05.03). One of the teaching assistants (TAs), however, made an unsolicited comment during the interview that illustrates another aspect of electronic feedback: *“I tell students to mail me back if they don't understand my comments. One student e-mailed me three times in one evening, but the majority don't”* (Extract 4, TA 2, 11.05.03). The inclusion of mandatory peer feedback also added a new element to the teachers' feedback role. Since students had to comment on two peer texts before getting teacher comments, the teacher (and TAs) also had to read and evaluate the student feedback and decide whether or not to comment on their comments:

“In the beginning teachers and TAs only commented on student comments when we disagreed. This was clearly a mistake and we started to acknowledge good student comments, for instance: ‘Very pertinent comment- I totally agree’. This was enough to give students the assurance they needed. It may seem like a minor issue, but it actually turned out to be a very important part of our job” (Extract 5, Teacher D, 02.06.03).

The introduction of the compulsory portfolio assessment system (made possible by Kark) also resulted in a huge increase in the quantity of feedback and thus the need for TAs. This also generated a new role for the ordinary teachers as responsible for quality assurance of the work of the TAs, and the development of new forms of collaboration. This will be discussed below in connection with the role of the TAs.

New teacher roles

The Teaching Assistant as “Writing Mentor”

The new position of TAs is a direct result of the requirement of the Quality Reform to provide a closer follow-up of students. The way the role of the teaching assistants is shaped is highly contextual, and in the department is directly influenced by Kark and the digital portfolio system. In the courses that use digital portfolio assessment, all the students are given feedback on two of their written assignments. In order to manage this time consuming task, the department hires TAs whose main task is reading and commenting on the students' assignments. We label this role “Writing Mentor”, because learning to write within the academic standards of the department is an essential part of the students' enculturation process.

The distinction between the TAs employed at the department and by other departments at UiB, is worth noting: while most TAs are undergraduate or master students, the department *only* employ TAs with a finished masters degree in history. This is a conscious choice in order to maintain high quality disciplinary standard and good mentoring. The TAs receive no official training in how to comment student texts, but as shown in our account of the teachers' role, some of them get on-the-job training through close collaboration with the teacher responsible for the whole course. TAs interviewed said they benefited from their experiences as masters students as well as their previous experiences with Kark. *“I learnt a lot about writing and feedback when I took my master's, particularly the “Manuscript Seminar” where master students presented part of their thesis and we took turns as opponents”* (Extract 6, TA 2, 11.05.03). This can be understood as training through modelling, and is facilitated through the open nature of the feedback system represented by Kark.

The format of the commenting does not follow a standard scheme or script, but is individual, and depends on the course context, as the following quotation shows.

“They [the comments on portfolio assignments] are not particularly standardised. It depends on the assignments given, and the person. In addition, there is another type of assignment that is commented, that is a compulsory assignment at the very beginning of the semester. And there, the comments are standardised. That is because of the large amount [of assignments]. Our students all receive a large amount of comments, in addition to a common comment if there are general things that affect everybody” (Extract 7, Teacher G, 11.10.05).

Considerable variations in the forms and extent of the teacher-TA collaborations were reported in the interviews. One of our interviewed teachers met with her TA regularly to discuss the requirements of the portfolio assignment, how to give feedback and how to assess student essays. Another lecturer who arranged regular meetings, regarded the meetings as a training forum for the TAs. The notion of collaborating closely with other teachers in the same course in this manner, can be seen as a new aspect of the role of the traditional lecturer, and reflects that a task specialisation with respect to teaching has taken place.

The most obvious technology related change is the public nature of the comments in Kark, as all comments in all courses are available to all faculty at the department, in addition to the students in the particular courses. This could potentially be a source of pressure, at least to the lecturers that are used to a non-presence regarding colleagues when teaching, or having a role that “*previously has been hidden from insight*” (Extract 8, Teacher A, 27.05.03). Teaching through Kark made the activity more transparent, and this new openness was “*problematic for some of the lecturers*” (Extract 9, Teacher A, 14.09.05). This was also mentioned by one of the TAs: “*I was most worried about posting my written comments on the net*” (Extract 10, TA 3, 11.05.03).

However, one of the interviewed lecturers shared the task of giving feedback to students in the course 50-50% with the TA, and he described the division of labour and the nature of communication between them in a way that illustrates their interdependence:

“Since I both deliver the lectures and the assignment texts, and... Have all the assignments that they write, naturally I am very interested in his comments. How he [the TA] comments, and that we are more or less on the same page. In that way, we are actually dependent of seeing each others comments, so that we can treat the students equally” (Extract 11, Teacher G, 11.10.05).

Extract 11 indicates a new type of collaborative teaching that that has come to the fore because of the tool that is being used.

Orchestrators

The other new role is found in the group often referred to as “Kark Support”. They fulfil roles spanning from teacher, administrator, consultant, negotiator to moderator, and the operation of Kark at the department is dependent on them. Thus we call them *Orchestrators*. The role has evolved first from the increase in the significance of Kark in the teaching-learning environment at the department, and secondly from the use of Kark in other teaching-learning environments. Their importance is regarded as high, as illustrated by the quote below from the person who initiated their positions.

“In a way, you can say that it is of crucial importance when it comes to ICT-based education, that you have someone who is willing to take the whole responsibility, and is capable of taking the whole responsibility. That is, at every department, you need a key person. If this person is not there...” (Extract 12, Teacher A, 14.09.05).

The emergence of this role is an example of task specialisation within the teaching-learning environment. The emergent nature of the Orchestrator is exemplified by how it hasn't become formalised within the university employment structure, or that the institutional conventions of UiB regarding employment didn't fit these kind of staff. Originally they were hired as administrative staff, with their positions placed under Unifob (<http://www.unifob.uib.no/>), a research organisation affiliated to UiB. Later, their positions were moved to the Faculty of Arts, still as administrative staff. Finally, they were hired as academic staff at the Faculty of Arts.

The constitution of this role as a whole is new, although the tasks are both overlapping and original compared to the tasks carried out by the traditional lecturers. They fulfil pedagogical functions, mainly through acting as writing mentors, but they also carry out a different set of tasks. These tasks are new elements in the shared repertoire at the department, as they gain meaning only through the presence of Kark. Examples include digitally administrative managing of students, courses and teachers in Kark, the moderating tasks of observing and managing the discussion forums for all the courses, the similar task of observing the other teachers' work, and negotiating with teachers in other departments or institutions that *need to* approach them when wanting to use Kark in their educational context. Examples of these tasks and roles are discussed in the following sections.

The orchestrators do not give lectures, but act as writing mentors in some courses. Extract 13 and 14 are comments on a question about what they do when they act as teachers.

“Yes, then we function as teaching assistants. That is what we do, when you look at it. And we think it is fine to do just that. Because then we get to try out our education on ourselves” (Extract 13, Adm 2, 29.09.05).

“Plus that you don't get to work with Kark [at the department] unless you are a historian. Given that, it is good to refresh our knowledge every now and then. To improve the academic activity...” (Extract 14, Adm 3, 29.09.05).

The role of acting as moderators of the discussion forums mediated by the Kark Debatt tool, is related to the role of being a teacher. The interviews reveal a stated interest in keeping the discussions going during the semester, although these are tied to the different courses. Additionally, they have the administrative role of managing courses through Kark. The following up of lecturers is an activity that they describe as “shepherding”, and involves for example ensuring that the teachers keep deadlines, and that they either make course material available on the “resources” pages in Kark or forward it to them. The quotation below illustrates the relation to the lecturers, with respect to this.

“[...] I keep myself posted on the lecturers' activities, and help them with things they wonder about. I will admit that I keep an eye on them, that they keep deadlines and such, I shepherd them a little bit. And I also prepare things for them in Kark, so that things run smoothly and so on” (Extract 15, Adm 2, 29.09.05).

This statement also reveals indications of a sense of ownership towards Kark. The sense of ownership can be found in their relation to other units that use Kark, within or outside of the UiB. For potential users of Kark, they are what Latour (1987) calls an *obligatory passage point*, which must be passed before the potential educational institution can use it. This can be called a negotiation of meaning, as the foundation for it is their understanding of the relationship between the tool and the teaching-learning environment in the two different contexts as something else than one-to-one. When discussing how an administrator or teacher new to Kark would make a selection with respect to the settings (cf. Extract 16, Adm 3, 29.09.05), it turned out that the new user would adapt the default settings after a negotiating consultation with them:

“Anyone that uses Kark or Classfronter [at UiB] comes here to talk to us, and then we listen to them to find out what they want to use it for. That is [issue] number one. To find out whether we think this is something that this tool can help them with or not. Or in use, at their institution. And if the answer is yes, we try to find out more about how they organise their teaching activities, and then we arrive at, in discussion with them... Or help them to arrive at the settings that would be useful to their course. And then they have sort of decided upon the default settings themselves. And then we help them, of course, by training them [in Kark] at the same time as we manipulate the initial settings. After that, they manipulate the settings themselves” (Extract 16, Adm 3, 29.09.05).

This quotation is an example of *brokering*. According to Wenger (1998), brokering is the act of using multi-membership in communities of practice to “transfer some element of one practice into another” (Wenger, 1998, p. 109). Another example of brokering by the Orchestrators is found in the ClassFronter-project, an experiment with a commercial LMS at UiB. They were invited to participate in the project because their competencies were believed to be useful in both contexts. Another reason was that Kark Essay was integrated with ClassFronter when this particular tool was chosen to be tested at UiB, as a prerequisite by the university. In an interview with the leader of the ClassFronter-project, we discussed the training of the teachers that were to take part in this project, and how that task was later awarded to the Kark support group:

“[initially] we trained the academic staff directly, which I found useful regarding the pilot projects. Later, Kark [the Kark support group] has taken care of the training of the academic staff, and guidance relating to the issue of pedagogical use of ICT. Because they are the ones that have, at least in the project group, competencies within this field” (Extract 17, Proj. Leader, 07.09.05).

The Orchestrator role is new with regard to the content and position, and associated with the diverse tasks of teaching, administrating, moderating, and the negotiating of meaning with external units, thus leading to an understanding of the role as an assembler of several related but diverse tasks, all tied to technology and teaching. They carry out new functions in the shared repertoire of the teaching practices of the department, and do so largely

because of the integration of a new tool in the teaching-learning environment, and have come to act as brokers of the repertoire originally local to the department in other teaching-learning environments.

Conclusion

Our study revealed a complex relationship between the introduction of technology and changes to teacher roles, and the teaching-learning environment in general. Some changes are technology driven, and others can indirectly be attributed to the presence of Kark. Some changes have occurred as a consequence of introducing portfolio assessment at the department, but this teaching method would not have been implemented without the pre-existence of Kark. (Paper based portfolios was not an option.) The use of Kark as a teaching and learning tool in the department, although predating the Quality Reform, is nevertheless also strongly influenced by the restructuring of higher education, for example as a mediator in supporting large-scale feedback to students as required by the Quality Reform. While new roles have emerged, we also found stability in the activity of lecturing in this department. Giving feedback is not a new role, but the nature of the activity has changed because of the new teaching method of portfolios. While the goals remain basically the same, some of the tasks have become more genuinely a joint enterprise, primarily because Kark facilitated transparency, openness, sharing and collaboration.

We argue that one of the most crucial changes in the traditional teacher role that equally affected the TAs, was the move from private to public feedback. This was a direct result of using Kark, as all the Kark Essay-mediated comments in a course are available to the entire teaching staff at the department. Teaching in higher education has traditionally been teacher dependent and personal (Oliver et al., 2005). However, when teachers at the department were able to observe how colleagues performed their job, it opened up an unintended teacher-teacher communication. This had a number of implications, both negative and positive. However, the teacher who shared the commenting 50-50 with his TA, found the new transparency unproblematic and even emphasised his dependence on reading the TAs comments for his course in order to treat the students equally. This indicates that a division of labour has taken place, and that the reading of colleagues' comments has become a *coordination mechanism* (Malone & Crowston, 1993) for teachers who have not cooperated on a course before.

It can also be argued that the transparency of Kark and the public nature of both student and teacher writing have lead to what Wenger (1998) calls “a regime of mutual accountability”. It involves “what matters and what does not, what is important and why, [...] what to pay attention to and what to ignore, [...] when actions and artefacts are good enough and when they need improvement or refinement (ibid, p. 81). Wenger notes that such a regime plays a central role in defining the circumstances under which, as a community and as individuals, members feel concerned or unconcerned by what they are doing. We do not have evidence of this, but it is likely that teachers as well as TAs who use Kark at the department will develop a degree of expertise in giving feedback and thus strengthen this aspect of their professional role. The orchestrators enhance this development, first because they take on the administrative burden of the digital tools, and second because they act as boundary persons between all participants in the system.

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