The role of university teachers in a digital era

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Abstract
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Abstract

The role of the teacher in traditional university teaching is not uniform, but depends on historical and cultural traditions, institutional characteristics, conceptions of teaching and learning, individual experience, and type of teacher personality. The new technologies will not change the role of the teacher fundamentally, but will, nevertheless, have profound impact on how the various approaches to teaching can be implemented in radically different technological and organisational environments. A typology of teacher roles is presented and related to current technological changes and to emerging models of ICT based learning, namely, virtual classroom, supported self-learning, and collaborative learning.

The sub-theme of this conference is "Transformation, Innovation and Tradition". The aim of my speech will be to raise some issues and present some perspectives concerning the transformation of the role of university teachers in the "Digital Era" which we have been discussing here in Bologna. In this city we have the feeling of being close to the very beginning of university teaching. On the other hand, we have been looking forward to dramatic innovation affecting the roles and conditions of universities in the years to come. My presentation will narrow the focus to the expected transformations in university teaching and its effects on the role of the teachers. The fact that I am not a university teacher myself may of course make it easier for you to disregard what I am saying. On the other hand I hope that my more than 25 years of experience in distance education may bring in some useful perspectives on the topic.

Do we agree on the "old teacher role"?

It is often very tempting first to draw a simplified picture of the role of the teacher in "traditional" or even "old-fashioned" education and then present contrasting visions of a new role in the future. In my opinion, there is too much easy and superficial talk about revolutions and paradigm shifts in education. Revolutions don't happen that often, and the impact of technology on education has not been overwhelming during the last 2000 years. The Gutenberg technology has influenced, but not changed, the classroom and lecture hall situation completely. Some blackboards have changed their colour and become "whiteboards", and overhead foils have gradually reduced the need of wall charts of various types. I believe these are the major general changes in educational technology in this millennium.

Fundamentally, the role of the teacher has not changed much. Or, I should rather say, there have always been different conceptions of this role. When some tell us that there is a major shift now from the teacher's teaching of predefined knowledge to the learner's learning through construction of meaning, I remind you of the Socratic method of teaching. Other long-standing distinctions are represented for example by the academic/formal tradition in universities versus the profession oriented, apprentice-type tradition in vocational training and parts of professional higher education. "Learning by doing" or by modelling behaviour is no new phenomenon. And when John Amos Komensky more than 300 years ago told us that teaching ought to be sensual, rational and spiritual, there is not much to add. To use all the senses, to challenge the intellect and to inspire the mind of learners, that is still a challenge for any teacher.

This means that we don't have a uniform role for a teacher, but rather a range of possible roles, depending on historical and cultural traditions, institutional characteristics, conceptions of teaching and learning, individual experience, and type of teacher personality. Of course, this makes the theme of my presentation much more complex, and it is not easy to believe that just one new teacher role will emerge as a consequence of the new "Digital Era".

Will it have to change?

We should first of all ask ourselves whether it is obvious that the role of the teacher will have to change in view of new information and communication technologies. Do the new technologies change the essential relation between teachers and learners? I would say no. In my understanding, teaching is a communicative process with the aim of enabling and enhancing learning, and this does not change with technology.

On the other hand, the emergence of a new technological environment may very well lead to major changes in the organisation and ways of implementing the teaching/learning process. In this sense we may say that the role of the teacher will have to change more or less dramatically, depending on how we imagine these new circumstances.

What will cause the changes?

Behind the idea of a new "digital era" lies a common perception of a profound, expected transformation of our society into a new type of society, usually called the *Information Society.* The penetration of new information and communication technologies in all sectors of the economy, in education and everyday life, is supposed to bring about this leap into a new digital future. Elements of the previous agrarian and industrial societies will of course prevail, but the expected changes will be deep enough for the society to take on a new set of characteristic features, linked more to the handling of information than to the production of goods. Paul Shrivastava (Shrivastava, 1998) has suggested the term knowledge ecology or knowledge ecosystems as metaphors of this new situation. In some respects the transformation is already taking place, but still many aspects and structures are lagging behind and are not yet well adapted to our future society. The education sector is finding itself in a somewhat paradoxical situation. On the one hand it is close to and a part of the information revolution. On the other hand it is in many ways representing a rather conservative segment of the society, slow in adopting new ways of dealing with information and with technology.

One of the problems with this situation is that it is difficult to foresee what the outcome of the transition will be, and what kind of consequences it will have for education. A recent report to the Dutch Ministry of Education, Culture and Science stated this dilemma by saying that in dealing with the future of education, both our idioms and our institutional frame of reference fall short. We always tend to use the words and concepts shaped by decades and centuries of educational practice and experience, even when we know that they may become obsolete in the near future. We will continue to use familiar terms, like 'school of the future', not realising that what we mean by 'school' today might be something completely different from the 'learning places' of tomorrow. Shrivastava says this in another way:

"*The knowledge function and access of this ecology extends well beyond the cognitive capacity of individual humans or even departments and divisions. It represents a new form of organized complexity that many managers and workers find incomprehensible. It falls outside the collective cognitive map of the organization.*" (Shrivastava, 1998)

A similarly radical view is presented in the Dutch report I already mentioned:

"*If we accept the view that society is transforming from an industrial stage to an information stage, there is no doubt that this information society will generate completely new definitions of education. These new definitions will come from the learning needs and possibilities in the information society, and they should*

not be regarded as a linear succession of today's education. .... In order to facilitate this transformation, it is required that the education system revises its relations with society, takes its needs seriously, and gives its demands the highest priority." (*Teaching and learning for the future,* pp 10-11)

Some of the relations with society which, I imagine, must be revised within the context of university teaching, are the following:

- *The dramatically increasing need of retraining and further education will change the role of universities and the composition of their student body.*
- *The everyday use of technology in working life and within the professions will make it necessary to incorporate technology applications much more widely in the education and training programmes.*
- *The traditional compartmentalisation of occupations and professions as well as their education will have to be broken down, and cross-professional and cross-disciplinary programmes will be more common.*
- *The new information and communication technologies will make it possible to organise education differently, and particularly to reduce the proportion of campus-based education.*
- *This may lead to new organisational patterns of educational institutions, such as virtual staff communities and consortia sharing students*

Different approaches to teaching

Before going further into the effects of ICT on learning and teaching practices, I will try to sketch some different approaches to what is meant by good teaching. A description of four teacher roles has been presented by the Norwegian psychologist Ivar Bjørgen (Bjørgen 1991). They are based on four different conceptions of what it means to be a teacher. Here is my translated summary of his descriptions:

1. **The sculptor**
   The sculptor takes full responsibility for the presentation of all relevant material. He controls the schedule and the curriculum and controls the work of the students. He doesn't bother much about motivation, and considers it to be the students' responsibility to learn what he tells them. He devotes some time to help the weakest of the students, because this is part of his task. The dialogue in the classroom aims mainly at clarifying the presentation of the textbook and correcting students' work.

   Key words: Presentation, structure, authority, teacher centred, control

2. **The entertainer**
   The entertainer thinks that a teacher is much like an actor. She feels that it is her responsibility to arouse the interest and make it easy to grasp the central issues of her subject. She works with background and perspectives. She tries to establish an active dialogue with at least some of the students, in which she will be able to present and accentuate her view. She is genuinely interested in the subject and in doing a good job, mainly during the classroom performance.

   Key words: Engagement, perspective, dramatisation, clarification, entertainment

3. **The coach**
   The coach believes that results depend on the work done by each of his students, and sees himself as catalyst for this work. He wants to know the background, conditions and capacities of each student, and to create an environment where they can achieve as much as possible. He informs them about the goals and the best methods, and discusses the programme with them. He is clear about evaluation criteria, gives feedback and helps them in tackling all kinds of problems. What counts for him are the results of the students in relation to their individual capacity.

   Key words: Companionship, planning, individual activities, support, feedback

4. **The manager**
   The manager looks at the classroom as a working place, and her task is to manage the joint efforts effectively towards the best possible result. Everybody should know how to learn, and she delegates tasks and responsibilities. She also varies working methods. She is aware of individual differences, and uses much time in explaining what to do and why. She is a democratic leader and discusses strategies with her students, but she also knows that structure and management is necessary.

   Key words: Communication, information, co-operation, goal orientation, efficiency

Bjørgen's typology is based mainly on research from upper secondary schools, but is in my view relevant also for university teaching. To illustrate different styles further I refer to three caricatures of different types of lecturers, originating from Habeshaw, Habeshaw and Gibbs. These are clearly related to university teaching.

Dr Tort expects her students to learn legal principles from books and to apply those principles to specific cases in the seminars. In her law lectures she demonstrates how to apply principles to cases. She is 'modelling' by lecturing, saying 'I want you to be able to do it like this'.

Dr Group talks about the sociology of groups in his lectures. The books (and there are twenty on his reading list for each lecture and hundreds in the library) all seem somewhat tangential to the topic. They all use special terminology and are difficult to make sense of. The lecture is a guide to a strange land. Dr Group gives students a map, indicates landmarks to look out for, and points out a few things about this strange land which they might have trouble finding on their own. He gives them a tourist's smattering of the language they will need in this land. He is trying to prevent them from getting lost when they start reading.

Mr System tells students the five elements of personnel management in his lecture. Each element has five sub-elements, and he gives an example of each. He is going to test students to see whether they can list these elements and give examples. His lectures are the content of the course. If students take a full set of notes and memorise them, they will pass the course.

(quoted from Morgan, pp 57-58)

These examples not only indicate different conceptions of the teacher role, but also different understandings of how learning comes about.

How do students build knowledge?

In order to evaluate different teacher roles and teaching strategies we should be aware of how students generally acquire and build up their knowledge. This is a big subject in it self and there is no time to go deeply into it. I will only put forward a set of relevant basic assumptions, based on fairly well recognised learning theory.

- We know that students' ability of learning is influenced by what they think learning is about. Many students think that learning is to pick up pieces and bulks of information, and that the teachers' job is to impart pieces of their subject knowledge to students. Even some teachers seem to think in this way, or behave as if they did. If this was the whole truth, we might easily fire a lot of teachers and let students either use the library on their own, or leave them to surf the Internet.
- Usually it is difficult to separate knowledge to be learned from the situations in which it is used. Learning is 'situated'. The abstract knowledge has no meaning unless it is used to solve concrete and real problems. Therefore, learning has its base in experience of real or close to real situations. That is why so-called 'problem-based learning' seems to be so effective, particularly in education for professions.
- However, in building knowledge the learner also has to transcend the immediate situation and reflect on the contextual experience in order to construct more general concepts, views of the world and problem-solving methods. Therefore, it is useful to articulate concepts and more general knowledge structures, and to discuss such articulations with other people. In one sense, the construction of knowledge is individual. But also social negotiation of meaning is necessary.

Based on a similar view on student learning, Diana Laurillard (1993) has identified five aspects of the learning process that should be addressed by students in order to succeed, and therefore also considered in any teaching strategy:

1. apprehend the structure of the discourse – e.g. focus on the signified, relate and distinguish evidence and argument, organise and structure the content into a coherent whole

2. integrate the sign with the signified – e.g. practise mapping between the two, practise the forms of representation of an idea, represent the discourse as a whole as well as its constituent parts
3. act on the world and on descriptions of the world – e.g. relating knowledge to experience, relating theory to practice, extending experience of the world, manipulating the various forms of representation of that experience
4. use feedback – e.g. both intrinsic and extrinsic feedback to adjust actions to fit the task goal, and descriptions to fit the topic goal
5. reflect on the goal-action-feedback cycle – e.g. relating this to the message of the discourse, the structure of the whole

How will technology change the roles of teachers?

How then will new information and communication technology change the way in which teachers shape and implement their role? There is no easy and uniform answer to this question. The reason is that it depends on how we conceive the role in general. And deliberately I said "we", since the teachers' own conception of their role will be influenced by the expectations they are met with both by the students and by the society. Clearly, some of the traditional roles of teachers already seem rather obsolete, quite apart from the introduction of new technologies. Those which are based on the assumption that the teacher should be the only and authoritative source of information, are rooted in a society which is not ours, if it ever was.

One aspect of the Information Society is a dramatically increased amount of information available, and an increased access to a variety of rich information sources. Another aspect is the increased possibility of presenting, editing, organising and manipulating information, e.g. in multimedia format. The chances that a teacher will be able to compete with the entertainment industry concerning the presentation of information should not be overestimated. I cannot see a bright future for this teacher role in the digital era.

On the other hand the wealth of available information probably makes it more difficult than before to apprehend structures and meanings. Students' perception of knowledge as pieces and bulks of information may be strengthened both by the amount and by the way it is accessed and organised. It may stimulate the senses more and give a more vivid flavour of reality, but the meaning and coherence may disappear. It is easier to grasp the structure of a linear textbook than that of a hypertext with a multitude of links. Which one is the best representation of reality is of course a different question. The teacher cannot continue to insist that his or her structure is the only one or even the best one. But it will be much more important in the future that students and teachers together address the issue of apprehending and constructing structure and meaning. The lecture and the textbook will not be sufficient any more. The teachers and learners will have to produce their own "textbooks" and presentations, as part of their articulation of the world, built from a wider range of sources. The teacher who thinks that this is her job only, as the "sculptor", is mistaken. The new teaching experience should be conceived, according to Karl Weick, as "learning in public" (Weick, 1997).

It is commonly argued that the shift in education will be linked to a shift in the arrangement and control of the learning processes. A greater part of the activities associated with learning will be initiated and controlled by the learner instead of the teacher. A different balance in the roles of learners and teachers is needed and a different climate and environment of communication and co-operation will have to emerge. If not for other reasons, this will be brought about by the changes in student populations and the contexts in which the educational programmes will be set.

Even if this balance of control needs to shift, that does not mean that the students will be able to or should take over the control completely. Both students and teachers will have to accept that they have a joint responsibility for the goals and methods of learning. In addition, the issue of the overall organisation of the teaching and learning activities will be addressed not only by the educational institutions themselves, but increasingly by the organisations in which students are employed or will be employed as well as by the society in large. The classroom or the lecture hall will no longer be the obvious solution. It is perfectly possible for learners to be at different places in time and space, and even so to be engaged in a common learning process, supported by communication technologies. This, however, introduces new possibilities, constraints and demands concerning the communication processes. Communication and collaboration processes are quite different in a distributed environment compared with the corresponding processes in the classroom.

The Information Society is not about incremental change or isolated effects within an existing system. Thus it is not a question primarily of *substituting* single elements of existing teaching practice with a CD-ROM or with Internet-based learning materials. It is more important to use ICT as *tools* for a variety of learning activities, and recognise and utilise it as a part of the *environment* where learning takes place. Then we must allow it to influence more deeply our teaching methods and the ways of organising learning processes.

Emerging types of ICT based learning and their influence on teacher roles

Looking at the field of open and distance learning we will observe that quite different types of learning and teaching models are emerging. It is relevant to consider how the role of the teacher is conceived and

develops within these different models. This field is not yet well researched, and thus I can only indicate very briefly some of the issues as I see them. I am using a fairly common classification of ICT based learning models or (description adapted from TRENDS, 1997).

Virtual classroom

Through audio and/or video conferencing, with connection in real time to one or more sites, it is possible to reproduce the classroom or lecture model, with the teachers and the learners in different places. The virtual classroom is usually teacher-centred, with the teacher/expert as the main actor. As in any ordinary classroom, the teaching strategies depend on the teaching model and the objectives of the teacher. The learners may attend individually, but usually they are forming local groups. They may use additional learning material, such as complementary information, practice, group sessions without the teacher, and self-assessment tasks. They can usually ask questions or intervene in other ways during the sessions.

The use of distance learning in many universities and colleges seems to be based on finding ways of presenting lectures through various types of technology, without changing very much the function or the content of the lecture. The change of role for teachers is then perceived mainly as a need for more thorough planning and preparation of their lectures, or as a possibility of using "the best lecturers" or add presentations by high level experts from outside the institution. Some say that both these aspects will lead to higher quality of teaching. But it is also argued that the new technology increases the dominant role of the teacher in imparting knowledge, making the teaching-learning situation even more authoritarian than in conventional education.

On the other hand, it is possible to shift the balance of control from the central, transmitting site towards the receiving site(s). A group of learners may invite external experts and discussion partners to participate by telecommunication, and thus enrich their learning situation. The role of the invited expert will then be more like a resource person, and the group of learners, or their local teacher, will be in charge of organising the learning process. In my view, the success of the virtual classroom model will depend on a shift of balance towards a more active use of the communication aspect of the technologies, and the incorporation of real time communication into a strategy with a wider range of learning activities.

This may, on the other hand, represent a threat to the traditional large and permanent university organisation, blurring the line between permanent staff and ad hoc expertise, liberating both students and staff from the strict faculty control of "the place, the time, the content, the delivery, and the quality of education" (Beaudoin, 1998).

Supported self-learning

In the second type, supported self-learning, the strategies used are learner-centred. The learner explores them individually. The model is based more or less on the same tradition as in distance learning. Contrary to the previous type, the learner has access to core content of the course, at the convenient time and for as long as he/she can, using on-line or off-line technologies. This model is very flexible as far as the place of learning is concerned. It is possible in this tradition to develop highly structured, pre-defined programmes of study. But flexibility is also often a characteristic of the course content, which may be structured and arranged in modular form so that it can be easily adapted to the learners' needs and knowledge level. The flexibility of this model implies a high degree of responsibility and self-discipline of the learners.

Although the self-learning model means autonomous and independent learning, it must also be *supported* in the sense that the educational organisation arranges tutorial support and an evaluation system. The distance learning tradition generally stresses the need of careful preparation of the learning materials. The support is designed to answer requests from the learners, and to assess and give feedback based on assigned tasks. Tutorial support contributes to the individualisation of the learning process, since it may correspond to learners' variety of interests and needs.

To some extent, this model is characterised by teaching strategies developed within more restricted technology options than we have today. But highly structured and polished lessons in pre-programmed classes or modules may be too static for a digital economy environment (Shrivastava, 1998). They may become obsolete even as they are under preparation. With richer information access it will become more attractive to include, together with any pre-produced learning material, other resource material which has not been structured according to the same principles. And the learners will always be free to use this kind of material in their learning process. The success of the model will depend on its ability to incorporate and develop new options and strategies based on new generations of ICT.

The role of the teacher may vary also within this type of learning scenario. And, like in traditional distance teaching, there will be room for specialisation and division of labour. One of the main roles will be to plan and prepare self-learning material. Another will be to provide supportive evaluation and communication, both related to pre-structured material and as guidance to students who are exploring new fields and structuring their own learning materials and project tasks. In the latter respect this model comes closer to the next one.

Collaborative learning

Nowadays, the new technologies have made possible a rich horizontal communication flow. The learners are able to exchange information and experiences in real or not real time, as well as carry out common

project work for both learning and operational purposes. The activities in a collaborative learning model arise when a group of people share the same goals, interest, needs, etc., and decide to work on these together. The learners can also work together on a subject proposed by their teacher. In a first virtual or face-to-face meeting the group settle down their ideas, the scope of their work and the activities to be carried out to achieve their initial goals. From there on all the participants will contribute to the final product, which can be, for instance, a project report or a multimedia presentation.

The dynamic flow of communication will to a large extent be shaped by the nature and the organisation of the collaborative project. The main task of the teacher will be to play the role of a moderator maintaining the discussion, suggesting new subject matters, new directions for information search or new questions related to the work that is being done. In this role the teacher will often be assisted by other members of the group. The work is normally group-centred without heavy constraints concerning time, space and schedules, except for the cases in which real time technologies are exploited.

Collaborative learning at a distance has its pitfalls and problems, partly linked to the communication tools and the problem of establishing the necessary common understanding of the tasks. Another problem is to establish and maintain the necessary commitment to the goals, the work schedules and the rules of communication and decision-making in distributed groups, which may be more difficult than in on-campus situations (see e.g. Fjuk, 1998). But collaborative learning has also an obvious potential for learning in the new Information Society. It is the starting point for the development of networked systems of knowledge resources, or knowledge ecosystems. In such systems we may find a blurring of the distinction between learning and work performance as knowledge creation and work interaction become collective, networked activities. This fact changes the concept of expertise and the conventional role of the teacher more fundamentally than in any of the other models.

Conclusion

I did not intend in this presentation to speculate about a digital era in university teaching in the future. Rather, I wanted to look at some of the fundamental aspects of teaching and some of the new challenges we already are facing with the technologies available. I am convinced that both the organisation and the strategies of teaching and learning in universities will have to change in the digital era. But they will have to change through exploration and reflection on new practices within the universities, and not through speeches from outside. Anyway, I hope my contribution has given you some food for this reflection. Thank you for your attention.

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