Running Future Workshops to Improve and Enhance Education Practice

Urban Nulden

Department of Informatics, Goteborg University, Sweden

Abstract:

This paper presents a theoretical and practical framework for Informatics research in the area of education. The context for this research is Sweden where schools often have an advanced infrastructure of computers and networks but the use, by teachers, of the technology, is very limited. The reason for this is two highly interrelated issues, first, teachers do not know what to do with the technology, second, many of the teachers are sceptic to the technology as well as conservative and reluctant to change their current practice. This paper presents an alternative where both these issues are governed.

1. Motivation

A new society is emerging and there are many notions of what this society is: post-industrial society, information society, learning society, digital society, etc. However, despite different notions, proponents agree that computing technology (CT) is an important part in this new society. The importance of CT is of course recognized in the education system. Community leaders, school boards, legislators, parents, etc., proclaim the value of this technology. Therefore, a large number of schools have an advanced infrastructure of computers and networks due to a 'push'. By this, schools ensure that students are exposed to computing technology as it will be a major part of their future lives. However, in this push, most teachers had no chance to assimilate and explore the technology on their own terms, and as a result of this, combined with a conservative attitude, their use of CT is very limited and this is a problem.

This paper discuss three issues related to this problem. First, adapting CT as a natural element in their work involves considerable change to most teachers. Second, the use of CT in schools, by teachers, must be more innovative and creative than currently. Third, institutions training teachers will benefit from an arena where educational aspects of CT is explored and discussed before they enter their profession.

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In this paper, an Informatics perspective is put forward. The practical departure to the three specific issues are through future workshops (FW). This is a technique for approaching a problematic situation, generating visions about the future, and discussing how the visions can be implemented. FW is a means to utilize the power and competence that appear when people experience that they have common interests, needs and problems. Groups of teachers, or education students, are here guided by a facilitator who ensures active and equal participation, and makes the participants aware of current CT trends and development. Users possess the practical understanding necessary as the basis for the design, but to support their technical imagination they must gain insight into new technological possibilities as well (Ehn, 1988).

2. Education System in Change

From one perspective, we can see that the education system is opening up and the borders of the past are slowly dissolving. And in line with this, the main tendency on all levels of the education system is to question the disciplinary borders, e.g., thematic approaches, where real life situations and problems are taken as a point of departure is strongly emerging as an alternative to a subject focus. However, mature organizational cultures, such as the education system, experience change, or the challenge to change, most significantly as a disruption, an intrusion, or as a failure of organizational defense. We can see that the form of schools and education has remained fairly unchanged over hundreds of years, and so has the technology used in teaching, despite both pedagogical and technological influence. Summarizing the critique of the current education system is that the underlying mission of education can not remain the inculcation of knowledge and skills, values and behavior, not the transmission of information and authority.

From another perspective, enthusiasts in the education system bring forward new ideas about pedagogy and technology. However, it is obvious that teachers and other school staff, as individuals, are well adapted to a particular niche and it is understandable that their first response to attempts at innovation would be one of resistance. The norms of 'the teacher culture' are profoundly conservative and teachers' resistance to change plays an important role in shaping their response to both pedagogical and technological innovation. We can also see that the more innovative the suggestions for change, the grater the critique, and hence its threat to existing principles, that is, the underlying ideas and insights. For years educators have tried to come up with ways to reform the system, yet many people have reached a point where the enormity of the task result in abandonment of the ideas. Over time the idealism and enthusiasm of the novice teacher will fade away.

Today the culture of the educational system and its technology is challenged. CT is here the main vehicle for implementing change and may help bring about some important reforms (Barker and Dickson, 1996). The ability to change is embedded in the culture of the organization. Historically, technology that reinforces existing lines of power and information have been adopted but this assures at the same time that the traditional approaches to teaching

will be cemented. The convergence of computing and communication technologies and the pervasiveness of computer networks—the Internet in particular—have strong potential for transforming education.

2.1 Struggling With Technology

Computing technology can be used to enhance existing traditional methods. This is what we do in most cases today. This means that no changes, at least no major changes, are made to the content and form of teaching. CT is used just as another technology for fact or information transfer. If we continue to re-implement conventional models borrowed from classroom based education focusing on passive transmission, we can expect only marginal improvement of the quality in our teaching.

Just providing schools with an infrastructure, that is computers and networks, will not have the desired effect. This push action may actually result in a continuation of the technology rejection. Teachers will begin the process of 'pull' when they know for what and how to use the technology. Today most educators have no idea where to begin and what to do with this technology. One reason for this is that *"most technology instruction in Colleges of Education involves teaching about technology as a separate subject, not teaching with technology by integrating it into other course work to provide a model for instructional use"* (From the U.S. Office of Technological Assessment, in (Wetzel and Chisholm, 1996)).

'Outsiders' have tried to introduce computing technology into high schools. After proclaiming its potential in the classroom, the teachers use CT only slightly, if at all. Even if CT artifacts are used, classroom practice remains fundamentally unchanged. As a matter of fact the last technologies that made a substantial influence on the general organization and practice of teaching were the textbook and the blackboard.

Educators often work in isolation and could especially benefit from sharing with other professionals. If teachers do not have the commitment to apply CT in their work, it is not going to happen. Instead of educators isolating the learning process within the confines of their own classroom and the particular school, they should forge links to the outside community to find ways of refining and sharing their knowledge with others.

A large number of teachers are confronted with new pedagogical principles as well as new technology. It is not easy to switch to a different mode of teaching and learning for those with years of experience of a traditional teaching. For them the view of the authority or the professional who is the ultimate source of all knowledge is threatened.

Teacher education has been out for long standing critique as most education of teachers, in CT use, focus on using software products, not the technology itself. Far to many training sessions emphasize computer hands-on, instead of discussing computing technology in a wider context. The ignorance of the technology comes apparent in cites like, *"computers are a good thing, but there are not programs available."* The teachers do not know enough to utilize the possibilities with the technology. Most teachers graduate from teacher preparation

institutions with limited knowledge of the ways of the ways technology can be used in their professional practice. However, there is work going on to integrate CT and its possibilities. These institutions has only recently discovered the pedagogical usefulness and advantage of the technology.

3. An Informatic Perspective

The major theoretical foundation as well as the practical guidelines in this paper originate from informatics. Informatics is the *"design oriented study of information technology use with the intention to contribute to the development of both the use and the technology itself"* (Dahlbom, 1996, p. 88). New use domains, in all fields, are constantly made possible by advances in computing and the central interest of informatics is to intervene and contribute to the process rather than just observe and describe it. Computing technology changes people's work and our interest is to augment their skills by the technology rather than replace them with the same (Ehn, 1988). Informatics' critique of traditional computing research is that it often is an *"anthropology of the past"* rather than an experimental *"archeology of the future"* which is our interest (Dahlbom, 1995).

3.1 Work Oriented Design

A central principle in informatics is that design of computing artifacts and design of its use should take place close to the users (Ehn, 1988). The approach is called participatory design (PD), where 'users' and computing experts share the responsibility for designing the technology and the new work place (Bjerknes, 1993). Note that PD is fundamentally different from 'user participation' where users serve as passive information suppliers. PD is a process of mutual learning where computing experts learn about the work and users learn about the technology. PD is therefore an approach which highly supports a software use perspective.

There are three different motivations for PD approaches in informatics (Greenbaum, 1993). First, from a pragmatic perspective, those who know the work should participate in improving the same work. Second, from a theoretical perspective, users and experts have limitations in communication skills and therefore need to work closely to gain understanding. Third, the political perspective, people have the right to influence their own work place.

Participatory design have many similarities with soft systems methodology (SSM). SSM is a problem understanding and problem solving methodology, introduced by Checkland (Checkland, 1981), which uses discussion, debate and the development of a series of models as a means to facilitate learning about a problem situation. The methodology evolved as a reaction to the evident shortcomings of traditional hard systems approaches which failed to address the complex softer issues. In the subsequent evolution of SSM, a strong user participation has been a major characteristic. SSM has evolved toward a collaborative approach where 'users' will involve other people in the process of problem handling.

Whereas as PD focus on the current work situation, future workshops is taking PD a step further by approaching the future. FW is a technique for approaching a problematic situation, generating visions about the future, and discussing how the visions can be implemented (Jungk and Müllert, 1987). The core of FW in this research is of course problems and visions concerning education practice as well as problems and visions with computing technology in education. The FW is divided in three phases: the *critique phase* were current work practise is in focus, the *visionary phase* were the participants discuss and propose alternatives without consideration of limitations, and the *implementation phase* were the participants discuss the realistic alternatives and how they can be implemented. A general prerequisite for constitution of FW groups is that all participants should share a problematic situation, desire to change it according to their visions, and have the means to do it. The FW is run by a facilitator who is guiding the participants and ensures active and equal participation, but also makes the group aware of current CT trends. A group of ten persons including the facilitator is an advisable size. Tools used are for instance wall charts and other tools allowing the participants to explicitly post and discuss each other's viewpoints and ideas, and very simple prototypes of CT.

4. Improve and Enhance Education Practice

There are several substantial outcomes of future workshops that will improve and enhance education.

First, future workshops are real eye-openers to conservative teachers in that they realize that computing technology is central to the entire shaping and direction of our education. They become aware of how they can use the technology and the awareness brings about the necessary motivation required to start changing the individual teacher's practice. For education students, the future workshop is a creative arena where they have the opportunity to shape their own and their students' future.

Second, the underlying principle of FW is to approach a problematic situation, generate visions for the future, and discuss how the visions are to be implemented; future workshops are likely to surface innovative and creative, but also realizable computing use domains in the classrooms.

Third, evolvement of 'teach cases,' which is an abstract description of an activity that can be supported by, or made possible through the use of a specific computing artifact. A 'class' or a 'course' consists of a number of activities with specific purposes, such as information searching, presentation, documentation, validation, etc. Each of these activities can be supported by one or many computing technology artifacts, such as: e-mail, presentation software, word processors, groupware, etc. It is important to emphasize that teach cases focus on processes, or activities, that take place in education, and on products, that is, computing technology. This means that the content of the activity is subordinate. In

contrast to most research and suggestions, the focal point in this research is not the subject taught in the class, but the type of activity that is going on.

Below is a tentative suggestion of two teach cases. It should be emphasized that the two examples are not the result of future workshops, but from my own experience with teaching and reflection over the application of CT to improve and enhance the learning process.

4.1 Example I - 'Opening Discussion'

The first example is opening discussion where we have an activity, discussion seminar, and we have a technology, Group Support Systems (GSS). GSS are general-purpose collaborative problem solving tools and usually based on a network of personal computers. All participants in a GSS session can 'talk at once' and the session can be followed on each computer and often also on a large public screen. All contributions become part of an electronic script. As all participants have an equal opportunity to contribute, strong personalities will not be dominating the meeting, and the more quiet participant is able to be more active.

For the purpose of discussion, one feature of particular interest is the option of being anonymous. Using this option, the class can discuss more controversial or unpopular issues without the fear of being exposed. Applying GSS in an opening discussion encourage students to participate if they desire to remain anonymous. This is an example of a teach case where computing technology facilitates the necessary conditions. From my own experience, I see many courses where this teach case could have been a very viable point to start a discussion. I do not believe full time anonymous students is a good idea, however, I do believe being anonymous in the opening discussion is feasible to surface the important issues no matter the content discussed.

4.2 Example II - 'Decision Making'

In the second teach case emphasize is on the decision process. Whereas the first case utilized existing software this case involves the design and implementation of a multimedia tool where a group of students interact with the tool in a decision making task. A scenario is presented to the students and they follow the scenario as it evolves and make decisions related to the scenario. The context for the scenario can be any context where decisions made now will have consequences in the future. For the students, some decisions are possible to regret, but most of them are not, all in line with reality. This type of tool provide the teacher with an opportunity to introduce decision making problems related to the specific subject discussed. Examples are environmental issues, the long term effects of pollution and social programs, such as housing and education.

5. Concluding Remarks

The motivation for this research is the fact that a large number of schools in Sweden have an advanced infrastructure of computers and networks. However, this infrastructure is poorly utilized by teachers. To change this, it is stated that a traditional solely expert driven approach is likely to fail. A more teacher centered approach, future workshops, is therefore suggested. User participation is a means of reducing resistance to the change process. It is postulated, that close expert and teacher interaction, i.e., future workshops, will result in innovative and creative ideas and design of computing technology use in an education context. These ideas and design will be communicated as good examples of CT use and serve as catalyst for other teachers.

6. References

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Urban Nulden is a doctoral student in Information Technology Use, Department of

Informatics, Goteborg University, Sweden

Voice: +46 (0)31 773 2763

E-mail: nulden@adb.gu.se