EDUCAUSE 2002: Juggling Opportunities in Collaborative Environments

ICT and higher education in the United States and the Netherlands

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1. Introduction

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The EDUCAUSE conference was held in Atlanta, Georgia, from 1 to 5 October 2002. EDUCAUSE is an annual conference on ICT and education in the United States. The conference, an amalgamation of what were formerly the EDUCOM and CAUSE conferences, is the largest in the United States in the field of higher education. The event is accessible to an extremely wide target group: from educationalists and librarians to policy staff and also programmers.

As every year, the programme was comprehensive. To make it as simple as possible for those attending, a number of preconferences (on 1 October) and 'tracks' were drawn up, each with its own theme, and people can register for these depending on their interests. Each day there were scores of parallel sessions, product presentations, poster sessions, birds-of-a-feather meetings and a great deal more for the nearly 6000 participants.

For the fourth successive year SURF Educatie<F> organised the EduTrip, in which this year over 100 people from Dutch higher education and education-related businesses took part.
The purpose of the Dutch visit to EDUCAUSE was first and foremost to get a shared view of the present state of affairs surrounding ICT in American institutions for higher education by means of the ability to network and establish contacts with our counterparts there. Based on this, a number of recommendations for the higher education sector in the Netherlands were formulated.

This year was no exception in that the visit was preceded by thorough preparation, with a subdivision into five themes:
- Educationa innovation using ICT
- Digital content and information resources
- Communities
- Strategy
- Evaluation of ICT in Education

Each participant registered for one of the five themes. Led by one or two EduGuides for each theme, each theme group made its preparations at the combined meeting prior to the EduTrip and in other ways. The EduGuides were also responsible for assisting the participants during EDUCAUSE and for the theme sections in this report. A section of this final report has been dedicated to each of the five themes, and each section covers four different views: Student, Lecturer, Management and Technology.
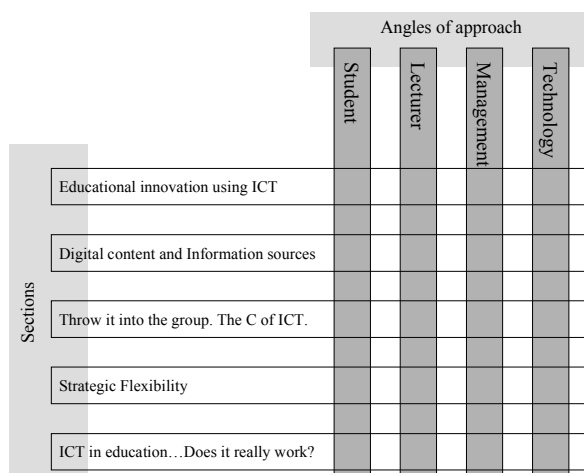
At the end of each section a number of conclusions are set out and recommendations made for higher education in the Netherlands. These conclusions and recommendations are summarised in the section on *Trends and recommendations*.

If you would like to know more about EDUCAUSE and the EduTrip you should consult:
-    http://www.educause.edu/conference/e2002/ (EDUCAUSE 2002 programme and materials, ordering tapes of sessions),
-    http://www.edusite.nl/EduTrip2002 (original reports by the EDUCAUSE 2002 participants; information on themes and EduGuides; organisational information; list of participants), and
-    http://www.surf.nl (where this report can be ordered in Dutch and is available in electronic form both in Dutch and in English).

A review of the literature used with a complete lists of participants' reports is included at the end of this report.

2. Trends and recommendations

Ineke Lam, University of Utrecht

Six of the seven central themes of which EDUCAUSE 2002 were more or less identical to those of the previous conference in 2001. What does this mean for the trends that could be identified? Which trends are new? Which are ongoing? At the very least this section will show clearly that a number of trends must not be regarded as stand-alone processes, but first and foremost as a process of organisational development or change.

At EDUCAUSE 2002 marked attention continues to be paid to middleware. Based on the Dutch experiences, we observe that innovation in education seems to be driven particularly by the technology. For the third successive year middleware turns out to be a hot item. Middleware ensures that different systems, such as an electronic learning environment and a library system, can exchange information with each other. Everyone endorses the need for further integration, but the integration of applications has a considerable effect on management and costs. This also makes it clear that a middleware solution is not only a technical challenge but above all also a process of organisational change, as is described elsewhere in this compilation.

Besides middleware, coverage of portals, including web portals, also turns out to be a current topic. It is noteworthy that here too the introduction of a portal must be regarded in practice mainly as an organisational development project.

A number of new developments could also be identified. In the area of handy hardware, for example, the breakthrough by PDAs (Personal Digital Assistants or hand computers) and the arrival of the Tablet PC, the size of a laptop, are worthy of mention. The added value of these for education, such as in fieldwork or on medical rounds, seems abundantly clear.

Fortunately, besides the attention paid to technology, there was also coverage of education itself. But the speed of technology developments contrasts with the slowness of developments in education. There is very little evidence of any real transformation of education under the influence of ICT. This means that at the level of the training elements the emphasis is still strongly on looking for ways of using ICT within a classical educational concept, and that genuine changes in pedagogy are lacking. Nevertheless, this could mean that there is educational innovation on a certain scale, though it seems to be a question of evolution rather than of redesign. An example of this is the reduction in the number of formal lectures and the encouragement of more interaction.

A day before EDUCAUSE 2002 began, MIT (Massachusetts Institute of Technology) opened its virtual doors to the public. In the OpenCourseWare project, the contents of MIT courses are made available free of charge via the web. One of the reasons MIT has taken this step is that it subscribes to the sharing of knowledge. It also assumes that an initiative of this kind will stimulate innovation. Rightly, one of the sections in this report poses the question whether Dutch universities will follow this initiative. Will making your teaching material available to others free of charge really become a trend? Lecturers in the Netherlands are readily convinced of the quality of their own teaching, but will those other lecturers really use colleagues' material? Perhaps there is a role here for the management of an institution to encourage them to do this.

The report of EDUCAUSE 2001 observed that, despite the fact that evaluations of distance learning had been discussed on a number of occasions, pedagogic evaluations were lacking. In that regard the EDUCAUSE 2002 programme was more promising because it was explicitly referred to as part of a track. One of the EduTrip theme groups has specifically involved itself in research and evaluation. Sufficient attention is therefore being paid, but is enough attention also being paid to educational evaluations? Section 7 of this report describes how the evaluations were concentrated mainly on technical and use aspects. The sessions in which the evaluation of educational theory aspects was discussed showed that genuine changes in pedagogy were lacking. ICT seems to be used as another platform for knowledge *re*production and not for knowledge production.

The libraries were again on the programme at EDUCAUSE 2002. If nothing changes a gulf will be created between the library and its demanding customers. Libraries must try to rediscover the link with the world in which students live by imitating popular search engines such as Google, opening virtual question banks where students can put questions to specialists via e-mail or chatrooms. Libraries certainly have a future as a multimedia learning centre. Initiatives in this area are under way, and not only in the United States; in the Netherlands too this development has already been set in train.

The communities must not, of course, be absent from the trends that are taking place, and that is why a theme group was put together for the EduTrip. Communities of practice and virtual learning communities are concepts which are occurring more and more frequently in the world of education, at least in the Netherlands. Only a limited number of sessions were held on this topic at EDUCAUSE 2002. No clear interpretation of the various concepts exists as yet. Often, moreover, collaboration and knowledge-sharing are mentioned in the same breath as communities. What did become clear, however, was that at any rate as regards communities what one has is a group of people who define a joint interest and deploy technical resources to encourage the exchange of knowledge.

Finally, an important role seems to be reserved for management, in devoting attention to the cultural change which takes place if ICT is introduced in organisations, for example when communities are set up. Management can also play an important part in stimulating lecturers to make their teaching material available to others (and for re-use by others) and also encouraging them to use colleagues' material.
It was striking that there was little mention at EDUCAUSE 2002 of middle management, whilst according to the authors of the Strategy section an important area of attention for strategy processes and innovation processes is located there. It was also observed that the concept of leadership is the subject of renewed attention. It is particularly at middle management level that leadership in terms of educational theory is expected.

Recommendations

Based on experiences at EDUCAUSE 2002, a number of recommendations can be formulated for Dutch higher education. These are arranged by theme.

Educational innovation using ICT
- Develop, as an institution, a vision of education in which innovation is solidly embedded in the framework of educational theory.
- Take account of the new ICT opportunities when designing the teaching and the learning centre; but rather than put them in the driving seat, derive them from the vision of education which the educational institution has developed.
- When designing innovative education, ensure that both ICT and educational theory are represented in the development group.

Digital content and information resources
- The libraries must ensure that their services are better coordinated with the world that students and lecturers live in.
- In developing new collections and information sources libraries must bear in mind the professional inputs that lecturers can provide.
- Invest in middleware solutions instead of individual system interfaces.
- As a small country, the Netherlands can and must also play a role in the creation of specifications and standards.
- In projects in the area of making digital content and information sources accessible and in the area of systems integration, it is important to ensure multidisciplinary membership of the project team so as to avoid a one-sided approach.
- Management must stimulate cultural change within the organisation, so that lecturers will be more open to the re-use of teaching materials.

Communities
- Draw up a common vocabulary surrounding the subject of communities.
- Pay sufficient attention to the split between offline and online contact moments.
- Ensure that there are suitable ICT resources, as regards both hardware and software.
- Make use of the new opportunities that communities offer in education.

Strategy
- Top management must devote more attention to supporting and supervising middle management.
- Pay attention to change management as regards projects and implementation sequences.
- Invest in middleware as an integration layer between systems.
- Set up task groups in which security experts work with lawyers and policy staff in order to arrive at clear rules at the level of the institution.
- Break through the isolated position which those responsible for ICT still often occupy in the organisation.

Evaluation of ICT in education
- Take pedagogic and didactic learning principles as the starting points in educational innovation using ICT.
- Coordinate the evaluation with the other innovation activities, for example the original plan.
- Use several tools when evaluating ICT in education.
- Be alert to the fact that not all the effects identified will be unreservedly attributable to ICT.
- Aim for an evaluation standard by means of which the effect of ICT on the teaching can be broadly charted. SURF Educatie<F> can fulfil a significant role in this.

3. Educational innovation using ICT
In search of new educational practice!

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Introduction

What impact are new ICT possibilities having on education? Is education being given a completely new shape, or should we be looking for a mixture of old and new? How should management encourage innovation? Answers to these and many other questions are being sought at EDUCAUSE 2002. After a brief description of the American context we review a number of new possibilities for education. The authors then outline a number of important technical innovations and describe the role of management. The section ends with conclusions and recommendations for higher education in the Netherlands.

Findings

Innovations in an educational theory context
During the visit to the University of Georgia[1] and at presentations by other institutions it became evident that innovations in American higher education do not simply proceed from the pioneering stage to implementation across a course or an institution. There is also hardly any evidence of a true transformation of education under the influence of ICT. In the main, what one finds is innovation driven by technology. What this means in concrete terms is that at the level of course units the emphasis is still strongly on looking for ways of using ICT within a classical educational concept (classroom or distance learning) simply because it is there and it offers certain (additional) possibilities. In some cases this results in interesting forms of educational innovation, with special attention paid to collaborative learning (see also the section on communities), student-centred and adaptive teaching[2][3][4]. There is evidence rather of evolution than of redesign, something which can also be found in a recent survey[5]. In concrete terms the intention is to investigate what impact the introduction of ICT has on the educational process, so that from this one can then distil criteria for good practices[6][7][8]. Only one or two people ventured a plea at the EDUCAUSE 2002 conference for the introduction of ICT to be preceded by thorough reflection on the learning process and the modernisation of education[9][10]. Also stressed was the importance of a good understanding of underlying educational psychology principles[11][12][13] in arriving at a design for a subject and in choosing suitable ICT resources. See for this the section on evaluation.

Student: individual learning paths and collaborative learning
Using ICT, attempts are being made to bring more customisation to education. Outlining differentiated learning paths for students puts special demands on developing learning materials and making them accessible, and it is therefore expensive. Solutions are being sought in the modular construction of learning packages[14][15] and the re-use of learning materials by institutions. Large-scale initiatives[16][17] show that you have by no means reached your goal with a technical solution only. Outstanding questions include: storing these teaching materials and making them accessible, copyright and plagiarism questions, investment and return[18], standardisation and interfacing between diverse electronic learning environments. Evaluating the quality and coherence of the teaching materials is an important area of attention as regards individual learning paths[19]. See also the section on digital content and information sources.

Lecturer: the organisation of collaborative learning
The possibilities of using the Internet for carrying out self-evaluation and peer evaluation are clear[20]. This can be achieved relatively simply via the World Wide Web. It is also possible to support collaborative learning in the context of multidisciplinary assignments[21], possibly with a mixture of campus and distance-learning students[22]. This latter combination does require the appropriate investment in the group process. A

problem in the use of digital projects is that cutting and pasting other people's work has become much simpler.

Aids have now become available to lecturers for comparing texts and detecting plagiarism[23]. There is more to a structural approach to plagiarism, however. Students must learn how to find sources and how to use them wisely. Lecturers must know how to reduce the risk of plagiarism by means of variations in assignments and by being involved in the intermediate stages and concepts. In addition, the institution or course must lay down rules of conduct, but to date this cannot be more than a means to an end.

Technology: handy hardware, middleware and web portals

Important developments in the area of handy hardware are the arrival of PDAs (Personal Digital Assistants or hand computers)[24] [25] [26] [27] and the Tablet PC the size of a laptop, which instead of a keyboard has a screen to write on. The reduced size of the PDAs is very attractive on fieldwork, medical rounds[28] and suchlike. However, the dimensions of the PDA screen in particular also limit its applicability, especially for people with less keenly adjusted motor skills. There is not much one can say about the potential of the Tablet PC so soon after its introduction; more will no doubt become clear at EDUCAUSE next year.

There was a great deal of coverage of the various middleware initiatives. Contributions about the Open Knowledge Initiative[29] and activities by the National Science Foundation[30] show that a great deal is being invested in collaboration between systems of all kinds. All this is 'work under the bonnet', but is indispensable for integrated web portals, management information systems, transaction processes and workflow processes, to name just a few areas.

Efforts in the area of portals for students and lecturers are also continuing this year[31]. Users want 'one-stop shopping' where, having logged on once, they can quickly go to relevant teaching and research functions, and likewise to all the administrative and social services. It turns out that three approaches to setting up a portal can be distinguished[32]: starting off with commercial software, the do-it-yourself approach and building on components from open source initiatives such as uPortal[33]. Achieving the integrated provision of services requires cooperation between many departments, as in practice the introduction of a portal is mainly an organisational development project.

The function of the library is changing[34] [35]. These changes concern the mediathèque tasks, learning centres with or without wireless access for laptops which students bring with them, the digitisation of source materials, but also content management of conventional and digital materials. See also the section on digital content and information sources.

Management: controlling innovation

In many higher education institutions in the United States, academic freedom extends so far that each lecturer determines to a great extent how a subject is taught and whether and how ICT is deployed in doing so. Lecturers prefer to maintain the existing situation and the tried and tested teaching model. The institutions are trying to inject some control into this; see also the section on evaluation. A widely used method is to provide lecturers and students with training and refresher courses[36] [37]. Other mechanisms are the provision of support on centrally selected ICT tools, setting up a network of specialists, quality assurance and accreditation. The EDUCAUSE organisation supports management in particular, using a programme for applied research, for example with trend analyses of wireless networks and the contracting out of ICT[38] [39].

Conclusions and recommendations

It was striking that innovation, as it can be seen at the EDUCAUSE 2002 conference, seems to be driven particularly by technology. The increase in the scale of ICT use for educational and administrative matters and the need to handle it efficiently and effectively are high on the agenda both in the United States and in higher education in the Netherlands[40]. We have not found genuinely new educational practice, rather educational practice which has been enriched and made more flexible using new ICT possibilities.

Account must be taken of new ICT possibilities when designing the teaching and the learning centre. Applied research, as carried out by ECAR[41], could also provide better support for decision-making surrounding innovation here. Ultimately, however, genuine educational innovation will depend on a vision of education, the design of subjects, and creative lecturers and students.

Recommendations
- As an institution, develop a vision of education in which innovation is solidly embedded in the framework of educational theory.
- Take the new ICT opportunities into account when designing the teaching and the learning centre, but rather than put them in the driving seat, derive them from the vision of education which the educational institution has developed.
- When designing innovative education, ensure that both ICT and educational theory are represented in the development group.

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4. Digital content and Information resources
Education is about the use of information and how to make sense of it [1]

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Introduction

Traditionally, the primacy of information provision in educational institutions lay with the libraries. As a result of the advent of ICT and particularly the Internet, a shift has occurred. There are now hardly any boundaries to the world of academic and popular information sources as far as students and lecturers are concerned. They are no longer dependent solely on the sources and databases in the library. The modern lecturer has access to the resources he requires to produce electronic study materials himself, make them available to students and exchange them with others.
Without change, a gulf arises between the library and its customers. At last year's EDUCAUSE conference the need for change was already clear[2]. At EDUCAUSE 2002 we examined what changes are taking place and in what ways ICT can help the library to develop into a modern mediathèque.

Findings

Lecturer: at the basis of new collections
The trend – which had already begun – towards re-usable learning objects or RLOs is continuing this year. RLOs have the potential to become the basis for a new kind of library collection. They occur in various forms. An important distinction which is made is that between digital assets and content objects. Digital assets relate mainly to pieces of information such as videos and illustrations, whilst content objects are concerned with learning materials. Most libraries already have various collections of digital assets. MIT's OpenCourseWare project[3] is an example of a digital collection, openly accessible for re-use worldwide, which is somewhere between digital assets and content objects[4].

One of the most important technical conditions for achieving re-use is having a common language. The IMS Global Learning Consortium is working on the development of unambiguous specifications which are intended to facilitate the concepts of re-usability and interoperability[5]. These specifications are being implemented in software programs more and more often. An important new specification this year is the Learning Design specification for which the Netherlands Open University[6] has laid the basis.

Although the technical problems demand a great deal of attention, they are certainly not the biggest obstacle to the re-use of educational material[7]. Lecturers, who are at the basis of the RLOs, must be prepared to make – or allow others to make – their teaching material suitable for use, and that turns out to be no simple matter.

Student: demanding customer
When they are searching for information, the Internet is more popular among students than the library. The way in which the information is offered on the Internet better matches the world in which students live. American libraries are trying to re-establish the link with the world in which students live by structuring virtual question banks[8]. Students can put questions to the specialists at this help desk via e-mail and chat rooms. The reactions to this are very favourable. The information specialists present at the session on virtual question banks put forward the idea of making the catalogues of the libraries accessible via a Google-type search engine so as to create a better match with the way students work. Searching in the catalogue must become so simple that no special instruction is needed.

Technology: the libraries as multimedia learning centres, integrated sources
Libraries certainly have a future as multimedia learning centres. An example of a learning centre is the Library West Commons[9]. In 2006 integrated services will be offered in a single building there from the library, the ICT and education department, the educational support department, the IT department and the internationalisation department. In anticipation of this project the concept is being tested on a small scale. The new library is an attractive, light space with old-fashioned reading lamps and armchairs. Staff are present who can provide support. The library is open day and night except for Friday night, Saturday night and Sunday morning.

The electronic learning environment is increasingly becoming the access portal to all the information from students and lectures. A frequently heard desire is for the different environments to be linked with, say, the services of the libraries and other information providers. The increase in the number of online information and teaching systems is making this all the more important. The two key concepts as regards searching for technical integration solutions between information systems are portals and (a standardised intermediate layer between the various systems).

The development of portals was the subject of several sessions at which the integration solutions were also presented. Fortunately, expensive solutions are not the only ones to be considered for the portal discussion: there are also open source alternatives which are being developed by and for universities[10]. An important point is the flexibility requirement. There are already many systems and possibilities which people often do not want to replace by means of the portal, but they do want to integrate them using it. This puts additional requirements on the design and choice of portals.

When developing middleware it is not solely a question of technology, as a great deal of attention must be paid to the needs that exist within the organisation and the culture of the organisation. Strong leadership is indispensable in this context. [11]
Integrating diverse ICT systems in an organisation involves technical challenges but is mainly a process of organisational change. In a middleware solution portals and electronic learning environments can be linked to the library systems and other information systems. MIT, as one of the initiative-takers in the Open Knowledge Initiative (OKI), is also strongly represented in this development[12].

The challenge lies not in the right choice of one of the available technologies, but in the approach towards building standardised middleware for a good portal.

Management: multidisciplinary cooperation
The strength of multidisciplinary cooperation within projects in the area of the integration of systems was highlighted in several presentations. *Connect people!* was the guiding principle of the session *Coursewhere? Integrating library services and resources into course sites*[13]. At this session a team of four experts took the stage, each of them illuminating an aspect of the project from his or her own specialisation. This might seem something that goes without saying, but in recent years many projects have been carried out in Dutch higher education in which the role of information specialists has been too limited. It is possible that as a result of this insufficient attention was paid when developing learning environments to structuring information, supporting the search process and quality assurance as regards the sources. In the development of information systems, too little attention has possibly been paid to their use in education. Collaboration across subject areas therefore seems to be one of the conditions for a successful project. It is management's task when deciding the membership of project teams to ensure that inputs will be provided by several discipline.

Conclusions and recommendations

EDUCAUSE this year clearly showed that the challenge in the next few years lies in cooperation between different disciplines. This collaboration can close the gap which threatens to arise between the library and its ICT-skilled users. It is important that in Dutch higher education more joint projects should be developed to which both the library and the developers of ICT in education make important contributions. In the development of new services it is important to realise what impact working with the Internet has for the world in which the students and lecturers in particular live. Middleware solutions indicate the direction in

which integration between information systems and teaching systems can be made possible. The advent of standards and specifications in describing information is facilitating re-use and interchangeability.

Recommendations
- The libraries must ensure that their services are a better match to the world in which students and lecturers live.
- When developing new collections and information sources, libraries must bear in mind the professional inputs that lecturers can supply.
- Invest in middleware solutions instead of in individual system interfaces.
- As a small country, the Netherlands can and must also play a role in the creation of specifications and standards.
- In projects in the area of making digital content and information sources accessible and in the area of systems integration, it is important to ensure multidisciplinary membership of the project team so as to avoid a one-sided approach.
- Management must stimulate cultural change within the organisation, so that lecturers will be more open to the re-use of teaching materials.

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5. Communities – The C in ICT

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Introduction

Merging information and communications technology is making it more and more possible to collaborate in virtual communities[1]. This can be done, for example, in the context of project teaching or problem-driven teaching, or forms of computer-supported collaborative learning where students can form a community. Communities are also playing an increasing role in professional communication between colleagues.

In all manner of places, in both the Netherlands and the United States, attempts are being made to gain insights into the possible success factors, organisational preconditions, life cycle, targets and target groups of communities. The formulation of theory is still limited, and many usable models were not yet shown at EDUCAUSE. The objective was modest: we wanted above all to try to gain a better perception of the features of a good community.

Findings

Communities: a young phenomenon

It quickly became clear that many different forms of collaboration and knowledge-sharing are meant by the term 'community'. The phenomenon is still young and will crystallise further. A good characterisation of the phenomenon is to refer for the time being to *a band of individuals who themselves define an interest and find each other in a virtual environment*[2], with knowledge-sharing and collaboration as elements which occurring to a greater or lesser extent. The degree of structure can also vary. In general people talk of two kinds of communities: communities of practice and virtual learning communities.

Student: collaborative learning

Virtual learning communities can play a role in the structure of collaborative learning. A review of what to do or precisely what not to do in the area of collaboration was given by Young Roby[3]. In another session Awalt[4] dealt with the potential for peer assessment in the structure of collaborative learning and the approach followed by her in that context. Her starting point here was that learning is mainly a social process and can therefore best take place in groups. This implies that to achieve the learning results both an individual and a group responsibility must exist. Facciponti[5] saw in the application of ICT the ability to achieve the desired collaboration. Part of the structure she put forward was the promotion of collaboration using outsiders, thereby creating an additional feedback option. Siddall[6] too advocated in his workshop a 'public' approach of this kind, in which the opinions of third parties play a role.

Lecturer: facilitator of the community

One of the possible aims of a community, according to Graetz[7] [8] [9] [10], is to make accessible knowledge which present in the group. Knowledge is present in the group members and can be shared in the community. According to Graetz, this sharing must be explicitly stimulated with the aid, for example, of a facilitator or moderator.

With collaborative learning, the student's learning process is paramount and formative evaluation is therefore desirable. Peer assessment makes a contribution to this. An advantage for the lecturer is that he gains more and richer information, including during the learning process. It also promotes horizontal communication and the burden of evaluation is shared with the students.

Gibson[11] emphasised the importance of virtual classes (or clusters) in the framework of online courses. He mentioned – among others – peer pressure and competition with other groups as important factors in the

success of a virtual learning community of this kind. In his view, having a strong joint focus is also highly important. In the structure applied by him, in which students direct each others' learning efforts, the lecturer can take on a different role: he develops from being an information source to being a teaching counsellor.

Management: added value of communities

Communities of practice in particular seem to operate well in the context of professional communication and collaboration if there is a clear aim and a clear focus on results. The added value and importance of the community need to be clear from the start. Sometimes a rather project-based approach is therefore chosen, in which above all the moderator (on behalf of the facilitating management) has a substantial controlling role. Important success factors are identified as the peer pressure which must exist in a group of this kind and the important of competition with other groups as the driving principle[12].

Deiss and Jurow[13] drew attention to another important aspect: the introduction of ICT in organisations, including in the form of communities, often brings organisational change with it. Lack of attention to this often results in the failure of such an introduction, and hence also of communities; sufficient attention must be paid to the culture aspect right from the start. Because people are 'hardwired for face-to-face communication'[14], possibilities such as, for example, non-verbal communication are often forgone in the practice of virtual communities. Sufficient attention on the part of management in particular to aspects of this kind is therefore essential. A moderator could play an important role in this.

Technology: online and offline facilities

According to Graetz[15][16][17][18] it is important to offer facilities which are fairly informal and which can tie in well with people's day-to-day activities. He had good experiences with Quickplace[19] and Sametime[20], but there are other options, such as Knowledge Forum[21], which is used in the Netherlands and with which good experiences have been gained.

Although we are dealing with virtual communities, it was continually emphasised that gatherings where you really see and talk to each other are essential. At the EDUCAUSE conference speakers did indeed go into the underlying mechanisms in that regard, but there was still little coverage of models which describe the conditions of use. Nonetheless, speakers did say that communities provide a knowledge dynamic in which knowledge is distributed more easily and trends develop more quickly. How, in what circumstances and with what results that happens is currently the subject of research in the Netherlands[22].

Graetz emphasises, moreover, that amply attention must be paid to group processes; he states that technology can never be a solution for poorly performing groups.

Conclusions and recommendations

The topic of communities is a live one both in the United States and in the Netherlands and the first descriptions of good practices are already being drawn up. At the conference it turned out that there was as yet no clear interpretation of the various concepts. This is a requirement if it is to be possible to compare the various initiatives and studies and describe good practices. It became clear that a community can best be regarded as a group of people who themselves define a common interest and deploy technical resources to encourage the exchange of knowledge. Control and direction from above do not automatically result in participation in knowledge-sharing. It was emphasised that collaboration is not always the best solution; when it is and when it is not did not become clear at EDUCAUSE 2002.

Recommendations:

- Draw up a common vocabulary surrounding the topic of communities.
- Devote sufficient attention to the split between offline and online contact moments.
- Ensure that there are suitable ICT resources, as regards both hardware and software.
- Use the new possibilities which communities offer in education.

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[1] In the literature one often encounters the terms Virtual (Learning) Communities and Communities of Practice. Although these are generally defined differently, this does not result in their mutually exclusive use: certain communities are designated as both VLCs and CoPs. Without wishing to become involved in

this discussion, here we use the term Community of Practice (CoP) to denote communities in which collaboration between professionals is central; for virtual communities which are used in the context of students' learning processes we use the term Virtual Learning Community (VLC).

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[20] Zie: http://www.lotus.com/products/lotussametime.nsf/wdocs/homepage

[21] Robert-Jan Simons, preconference to the SURF Education Days on 5 November 2002.

[22] Inter alia at the IVLOS-Expertisecentrum ICT in het onderwijs van de Universiteit Utrecht [University of Utrecht's IVLOS Expertise Centre for ICT in Education] and the Dinkel Institute of the University of Twente.

6. Strategic flexibility: new directions for ICT leadership in higher education

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Introduction

Last year the central question at the time of the visit to the EDUCAUSE conference was why the strategic questions relating to the use of ICT in higher education only attracted attention after technical and later also educational questions had been answered.

The question this year is whether higher education institutions are capable of responding flexibly, precisely also from an organisational perspective, to the developments which the use of ICT in education is bringing with it. How can the higher education institutions cope with the problems of mergers and enlarged scale using their present control mechanisms?

Findings

Student: self-service and integration
Self-service in the administrative systems is highly prized by the institutions' customers, but although the streamlining of processes results in greater customer satisfaction it does not automatically result in demonstrable gains in the area of costs.

Electronic learning environments for students take on the form of total environments. For example, the Blackboard learning environment was equipped not only with a portal module, but also with facilities to use payment cards and carry out money transactions.

Lecturer: re-use of content
One of the spectacular developments was the initiative by MIT (Massachusetts Institute of Technology) which, using the OpenCourseWare[12] initiative, makes all the content available free of charge via the Internet. It is an interesting question whether the higher education institutions in the Netherlands will follow this example and if so how, for lecturers in the Netherlands are convinced of the quality of their own teaching. The challenge here certainly lies in the enterprising spirit of management in encouraging them to make their content available.

Technology: permanent source of innovation
Technical developments point in the direction of integrating speech, language and data on the same IP[3]-based infrastructure. Whilst developments have been followed with close attention by senior management, at the operating level the indications are that IP telephony will not be implemented on a large scale before 2005.

Another hot item turned out to be the number of sessions on middleware (*The stuff everyone wants and no one wants to talk about…*). Everyone endorses the need for further integration, but the integration of applications has a considerable effect on management and costs. The aim of middleware strategy is to maximise the value of investments in ICT, coordination between campuses and improve integration with other institutes.[4] Via broadband connections extending as far students' residences and regions, a great deal more information can be exchanged. A development can also be seen in wireless networks and other wireless communication technologies which operate using a smaller bandwidth and at a short distance. These bring with them their own security risks. Institutions are development a flexible strategy for access to the university network which takes account of the technological typology.

Management: strategic questions and new requirements
As last year, the implementation of ERP systems[5] played a role in various sessions. The implementation of ERP must be regarded as a process of organisational development and not as an ICT project, as the operating process must be modified to reflect the system (customisation). Drexel University presented a model in which as an Application Service Provider (ASP) it acts for smaller colleges in its surrounding area. The cost-benefit relationship is clear: the colleges cannot afford the costs individually. Drexel defines the design and development of the systems and hence takes up a position as a true ASP. The strategic implications of ASP solutions of this kind can still be viewed as troublesome. The 2002 Campus Computing Survey reported a new emphasis on the area of ERP and on administrative applications instead of the trend towards the application of technology to education. One surmises that in higher education there is more need for data analysis.

New possibilities and technological challenges impose different requirements. In the area of security guidelines, in the United States one sees new initiatives in the aftermath of 11 September 2001. A task group has been set up to make the universities aware of ICT security risks such as denial-of-service[6], hacking and viruses. Universities are being advised to set up their own task groups in which security experts work with lawyers and policy staff to arrive at clearer rules at institutional level.
Change management in systems and structures is becoming increasingly important, because the customers (students, staff members, external contacts) require continuous service, while the systems are becoming more and more complex and their mutual dependence is increasing. At strategy level this requires a clear choice of the direction in which the institution is going. At operational level new requirements are making themselves felt regarding the quality of the infrastructure, the servers, etc. Universities too therefore see themselves faced with a process of centralisation of hardware and software, with outsourcing of services mentioned as one of the possibilities.

Restructuring an organisation in a process of innovation results in the need for top management to have a perception of the sort of organisation they want to put in place. As has been argued previously, organisations will look different in the 21st century. The traditional bureaucracy form will disappear and new, more flexible, forms of organisation will appear. In a workshop, Fulton[7] reported on research into the different organisational structures and their relationship to change. She compared five structures: traditional bureaucracy, a matrix structure, a web structure, a trellis structure and a network structure, and expressed her preference for structuring a good ICT organisation in the form of a network or trellis structure. Structures of this kind embody a greater risk that they will end in chaos, but the advantage of them is that they can cope with the maximum amount of innovation, flexibility and adaptation. Fulton argued that when choosing a new organisational structure top managers must choose between stability and flexibility and that almost by definition choosing stability implies choosing stagnation instead of progression.

Conclusions and recommendations

It was striking that many contributions on the theme were intended for top or frontline management and that there was little mention of middle management. In our view an important area of attention for strategy processes and innovation processes located there. It is precisely at middle management level that processes grind to a halt owing to the diversity of their elements and low acceptance of the strategic direction. In the Netherlands too institutions are looking for a new structure to enlarge the basis of support for decisions at senior level, to operate in a more question-driven way; and by that means to set up joint projects (at middle and senior level) and also to set up quality circles. A problem here is that at the middle level one often runs up against isolated ICT positions which in fact exercise the power. Because consensus management prevails at senior level, it is difficult to break through this. It may be that working with task groups in which expertise and a basis of support come together, as often occurs in the United States, will provide an answer to the ICT control questions in Dutch higher education institutions, for the classic top-down approach seems to work poorly. Howard[8] concluded: *"Change is disruptive. Current organisations are built to resist change. We have to deal with change, not the technology"*.

As early as at a meeting at EDUCAUSE of the theme participants it was observed that the concept of *leadership* is enjoying renewed attention. This concerns firstly leadership which involves projects at all

possible points (and layers!) in the organisation, but above all it also concerns *educational leadership* which is expected particularly at middle management level. The examples at EDUCAUSE showed that leadership in innovation projects is still being interpreted mainly from a technical and facilitative point of view. One can recognise this in the Dutch situation.

Recommendations
- Senior management must devote more attention to supporting and assisting middle management.
- Pay attention to change management in relation to projects and implementation sequences.
- Invest in middleware as a layer of integration between systems.
- Set up task groups in which security experts collaborate with lawyers and policy staff to arrive at clear rules at the level of the institution.
- Break through the isolated position which those responsible for ICT often still occupy in the organisation.

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7. ICT in education…Does it really work?
On the evaluation of the application of ICT in higher education

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Introduction

Although ICT is deployed in education on the basis of various motives and intentions, evaluation of it is often concentrated on technical and organisational aspects. Effects on pedagogy and the learning return of students are seldom mentioned or are mentioned only in passing. These latter effects seem to be difficult to measure, as is shown by a brief inventory of the Dutch situation. From this perspective a visit was paid to the EDUCAUSE 2002 conference, where the focus was on the following questions:
What effects does the use of ICT in education have on the performance of lecturers and students, on the learning process and the learning return, compared to education without ICT support? Can these effects by demonstrated by means of systematic research?

Findings

Management: know what you are measuring
The measurement of effects is preceded by the question of what the aim of the strategic deployment of ICT in education is. Broadly speaking, three aims are distinguished:
- Improving the educational organisation: efficiency, flexibility, communication, financial return;
- Improving the learning effects: effectiveness, quality, results, learning return;
- Initiating or supporting educational innovation: new didactic approach, with improvements in learning effects as the result.

If an institution pursues all these aims, measurement of the effects must also cover these areas. In practice, however, evaluations concentrate mainly on technical and use aspects. In this context Brown, Ehrmann & Lippincott mention the importance of coordination between difference innovation activities such as: plan, resources, support, implementation, evaluation and adjustment[1]. The EDUCAUSE organisation also lays down coordination as an important criterion in assessing institutions for innovation prices[2].

Technology: how can you measure whether it works?
Studying the effect of ICT on education is the core of this theme. Good examples have been sought of evaluations where the effect of ICT on the teaching could be demonstrated. What variables are being measured? How? It is striking that a baseline measurement is seldom if ever made, nor do measurements include a control group against which the results of the study can be compared.
What is also striking is that in many sessions a two-stage method is recommended. There are principles that promote learning, such as interaction between students. One can measure whether these principles are reinforced. If they are, then it is likely that the learning has also been promoted. But note carefully that this is an assumption.
Didactic and educational psychology principles were described in various sessions, and in the context of these the 'seven principles of good practice' of Chickering and Ehrmann[3] were also often mentioned at EDUCAUSE 2002. Contributions were also made from cognitive educational psychology, such as activating prior knowledge, using recognisable problems, making allowance for misconceptions and devoting attention to the transfer of acquired knowledge[4] [5] [6].

A number of general tips for carrying out a proper evaluation were given at EDUCAUSE:
- Evaluation only makes sense if the results are used in decision-making[7] ;
- Take quality criteria for an (online) course as the starting point[8] [9]
- Unravel the learning process into triads of activity, desired results and ICT tools[10];
- Think of evaluation in the long-term: information from alumni;

- Have the evaluation drawn up by a team which includes (among others) stakeholders, lecturers and an evaluation expert;
- Use a number of measuring tools.

Examples of tools used were: comparison between an ICT-supported group and a group without support as regards assessment results and drop-out, repeated short questionnaires (one-minute surveys*)*, more extensive evaluations halfway through and at the end of the course (written/oral, quantitative/qualitative), lecturers' logbooks, observations (of meetings, sites, course material, dates of submission of assignments, e-mails, etc), quality check by an educationalist[11], analysis of log files[12], thinking-aloud sessions and recordings using a screencam[13] .

The commonest evaluation tool is questionnaires, online or otherwise. There is an interesting project regarding these: the Flashlight project, directed by Stephen Ehrmann[14]. Although validated data are lacking, this project seems to have the potential for a successful formula. Services are offered in the area of evaluation, as regards both the survey format and access to an extensive database of evaluation questions, within which one can search on one's own teaching situation. The project also facilitates peer consultancy, with the members being able to use and comment on each other's questionnaires and analyses[15].

Student and Lecturer: what works?
Besides the method of evaluation, people looked at the outcomes of evaluation research. The sessions visited shoed that the application of ICT in education generally has little demonstrable effect (costs, time and learning effect) on the average student[16]. Treviranus's research shows the same picture, though it shows that the use of ICT does have a positive effect on students with learning problems[17].

If a significant difference is in fact found, it cannot unreservedly be ascribed to the introduction of ICT. First of all the Hawthorne effect may have occurred, the increase in returns being caused by the 'novelty value' and the fact of being observed. An interesting question is whether these effects are lasting. No answer to this was to be found at EDUCAUSE. In addition, so many variables have a part to play in education (the way in which ICT is deployed, the lecturers, the students, the motivations of both, the instruction, etc.) that it is impossible to ascribe the difference purely to the use of ICT.

Bearing these reservations in mind, the results of a major study by Lockee, Davis and Wingard, in which seven universities took part, are now described. A number of changes in the didactic process were found as regards teaching and learning using ICT: fewer lectures were given, lecturers had higher expectations of their students, they provided better instruction and there was more interaction. According to the two-stage system referred to earlier, it is therefore probable that learning was promoted in this way. It should be noted, however, that still no genuine transformation of the teaching took place. The didactics applied remained basically unchanged and education oriented towards knowledge *re*production did not, for example, suddenly turn in the direction of knowledge *pro*duction[18].
The absence of genuine changes in pedagogy was mentioned in other sessions. For this see also the section on educational innovation using ICT. Research by Wijekumar into the best and worst outcomes of ICT applications in education showed that ICT is deployed mainly to reduce costs, for example by reducing the contact hours. Wijekumar asserted that by definition a fully online course cannot provide good teaching. ICT ought only to be employed after thorough consideration by lecturers of their courses, so as to avoid its leading to a deterioration in learning performance and so that it is deployed where it is of real use.[19] [20]

Conclusions and recommendations

In the United States ICT is currently being deployed in education in such a way that the learning effect is at least maintained and in some cases improved or renewed, which incidentally cannot be indiscriminately attributed to ICT. Whenever one opts for ICT as a learning aid, improvement and innovation can be achieved by first considering thoroughly a number of pedagogic and didactic learning principles and, from these, examining what the contribution of ICT might be. This could also mean that a decision is taken not to deploy ICT, because in certain cases it could even lead to a deterioration in learning performance. There was little mention at EDUCAUSE 2002 of educational innovations oriented towards knowledge production. ICT seems rather to be being used as another platform for knowledge *re*production. Besides

educational innovation, the increase in flexibility in the educational organisation (distance teaching, specific target groups) could be an important reason for deploying ICT.

Various tips and methods for the evaluation process were passed on which are applicable to the Dutch situation. For example, recommendations were made to ensure that there is coordination between different innovation activities, to use several tools when collecting evaluation data and not to attribute the results indiscriminately to the use of ICT.
All in all, demonstrating the relationship between a particular way of deploying ICT in education and an improved learning return from the student's point of view still seems to be virgin territory. It would perhaps be a good idea if SURF were to start an evaluation project in the Netherlands, similar to the Flashlight project already mentioned.

Recommendations
- Pedagogic and didactic learning principles must be taken as the starting point as regards educational innovation using ICT.
- Use several tools when evaluating ICT in education.
- Be alert to incidental variables which cloud the possible effect of ICT on the education, or indeed seem to strengthen it.
- Aim at an evaluation standard by which the effect of ICT on the teaching can be broadly delineated. SURF Educatie<F> can fulfil an important role here.

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8. Literature

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Participants' reports
The reports prepared by Dutch participants in EDUCAUSE 2002. No fewer than 108 reports were written this year! Our sincere thanks to all the participants for their contributions. The complete reports, in Dutch, can be found at: http://www.edusite.nl/EduTrip2002/verslagen

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9. EduTrip 2002

Introduction

This year SURF Educatie<F> organised, for the fourth successive year, a trip to the EDUCAUSE conference. Those participating in the EduTrip 2002 were able to gain a great deal of information and make many contacts (networking) regarding ICT in American education. The SURF EduTrip programme helped the participants:
- to make thorough preparations for the conference,
- to reflect jointly on the information offered, with the help of the EduGuides,
- to network systematically with Dutch counterparts,
- to translate the information gained to the Dutch situation.

Organisation

At SURF, the organisation of the EduTrip was in the hands of Bas Cordewener and Inge Keijsers.
The concrete organisation was looked after by Pierre Gorissen (Fontys) and Ineke Lam (University of Utrecht), assisted by nine EduGuides: Frank Benneker (University of Amsterdam), Jan Daniels (Open University & Limburg University Centre), Liesbeth Dirksen-de Tombe (Vrije Universiteit Amsterdam), Ton Kallenberg (Erasmus University Rotterdam), Iris van de Kamp (Van de Kamp E-learning), Saskia Noordewier (University of Utrecht), Hans Ogg (INHOLLAND University of Professional Education), Peter Schelleman (University of Utrecht), Jan van der Veen (University of Twente), Albert Visser (Utrecht University of Professional Education) and Jan Wijbenga (NCH University of Professional Education)

Before and during the trip Hans Reitzema (Edu Media Web) reported in text and pictures on the ups and downs of the conference-goers in the Edu Gossip Daily, which can be accessed on line at http://www.edusite.nl/EduTrip2002/gossip

Evaluation of EduTrip

This year an extensive evaluation was also carried out among the EduTrip participants. They were requested to answer 21, largely multiple choice, questions via an online questionnaire form. As additional motivation, for every 25 evaluations returned, free admission to the SURF education days (in The Hague on 5 and 6 November 2002) was awarded by lot, or if preferred a conference fee for the ALT-C 2003 conference, the theme of which will be Communities of Practice and which will be held on 8-10 September 2003 in Sheffield, United Kingdom. In total the question was online for nearly two weeks and one e-mail reminder was sent to the potential respondents. Of the 103 participants who went on the EduTrip 65 completed the questionnaire, giving a 63% response. A number of questions in this evaluation are reported on below. N.B.: the statements made here relate to those people who completed an online evaluation form.

How often have you been an EduTrip participant and how familiar are you with EduTrip?
For 50 of the 65 participants it was the first time they had gone on an EduTrip. For eight people it was the second time, six people have been three times and one person has been on all the EduTrips. Rather more than half of the 65 respondents became aware of the EduTrip via colleagues. The Edusite also plays an important role in providing information about the EduTrip, with rather more than a quarter of the participants becoming aware of it via that source.

Reasons for going on the EduTrip
Participants could give more than one reason why they went on the EduTrip in 2002. Rather more than half gave *to network* as a reason. Sharing second place were *at the request of the institution* and *because of the themes which EduTrip team has drawn up* (37% and 35% respectively). The theme of the EDUCAUSE conference was also a reason (or one of the reasons) why 28% of the participants went on it. Finally, 19

participants also mentioned other reasons, such as: *keeping up to date, good reports from colleagues who have already been* or *my own professional development.*

EduGuides: the system, how they operate and the support they provide
Approximately half the participants rate working with EduGuides as a means of obtaining support as good or very good. A small proportion of the participants do not share this view at all: they regard working with EduGuides as poor or moderate.
If we look more specifically at how they operate and the support given by the EduGuides for the theme which the participants themselves have chosen, then nearly half the participants take a positive view. Some of the participants are not satisfied with how they operate. For this see also the suggestions for improving the EduTrip.

Should SURF organise another EduTrip next year?
With one or two exceptions, the participants who completed an online evaluation form were unanimously of the opinion that SURF should organise another EduTrip in 2003. In the notes to their answers participants highlighted the fact that added value is created particularly by *going somewhere after joint preparation* and by the *networking*. The organisation of the EduTrip, which made going on it efficient, was also highly praised.

Did EDUCAUSE 2002 fulfil participants' expectations?
Rather more than half the number of participants stated that EDUCAUSE 2002 fulfilled their expectations *reasonably well*. For 29% the conference completely fulfilled their expectations. A number of people were less positive: seven answered *a little,* for two people the conference *did not really* fulfil their expectations. Finally, one participant stated that EDUCAUSE 2002 fulfilled his or her expectations *not at all*.

Did EduTrip 2002 fulfil participants' expectations?
In general the participants were more positive about the EduTrip itself than about EDUCAUSE 2002. For 58% the 2002 EduTrip *completely* fulfilled their expectations, for 40% *reasonably* so. Only one person stated that the 2002 EduTrip fulfilled his or her expectations *a little*. No one gave a negative answer to this question.

Suggestions for improving the EduTrip
Various suggestions for improvement were made by the participants. One of these was made strikingly often. Nearly a quarter of the participants stated that they would like to see the EduGuides take on a more active role, providing more coordination, for example liaising better regarding who attends which session and who reports on it, and that they ought also to be directed more strictly with regard to supervising their theme group, for example by obliging them to hold meetings with the participants of their theme group during the EDUCAUSE conference. A number of people also make the suggestion that the EduTrip themes be enabled to coincide with the EDUCAUSE tracks. Finally, among the other suggestions made were the following: *reserve a Dutch Meeting Point, organise a Dutch drinks party and arrange a joint introduction to and conclusion of the EduTrip.*
Including a visit to an American university in the programme certainly turns out to be worthwhile.

Conclusion
Evaluating retrospectively an event such as the EduTrip turns out to be a very valuable exercise. The organisation is not disappointed with the reactions, but a detailed evaluation document has also been prepared for the EduTrip 2003 organisation.
For SURF Educatie<F> it is recommended that for evaluating gatherings, conferences and study trips more frequent use should be made of the online tool which they have available for that purpose.

EDUCAUSE 2003

EDUCAUSE 2003 has been given the following subtitle: *Balancing Opportunities, Expectations and Resources.* The conference will be held from 4 to 7 November 2003 in Anaheim, California.
For more information see: http://www.educause.edu/conference/annual/2003/