

Keynote address

ICT in higher education: An uncomfortable zone for institutes and their policies

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This contribution is based on an overview and analysis of ICT related innovation projects in Western European countries, with a more in depth look at approaches in Flanders and the Netherlands. To explore the uncomfortable zone for institutes and their policies, a number of recent evaluation and monitoring studies are reviewed and commented upon. This results in an institutional policy analysis that touches upon a wide variety of variables and processes related to management, expertise, infrastructure, the primary process and conceptions. To inspire the development of a more comfortable zone, the author moves to an analysis of recent developments and initiatives. A key element that results from this analysis is the strong focus on the development of middle management expertise to foster *change management*.

Keywords: ICT, Flanders, Netherlands, policy, policy analysis, innovation

Introduction

Information and communication technologies (ICT) are a mainstream issue in higher education (HE). In the Western European context, it is now an accepted practice to integrate ICT in major logistical, organisational and educational processes of higher education. A typical example: Ghent University, one of the leading universities in Flanders (Belgium) introduced in 2003 a campus wide electronic learning environment (Claroline; open source package). In one month's time, 15,000 of the 26,000 students were registered for about 60% of all university courses. This Flemish example mirrors the typical situation in the Netherlands. In 2003, 80% of the higher education institutes have implemented or were implementing a campus wide electronic learning environment (ELE), (Kop, van den Berg & Klein, 2004). Compared to a quick scan carried out in 2001, this represents a large increase. In 2001 only 38% of universities and 16% of higher professional education institutes were using an ELE. But already at that date 75% of the universities and 50% of the higher professional education institutes were setting up pilots or were designing plans to implement an ELE (Lubberman & Klein, 2001). Nevertheless, these figures mask a rather different reality. In an in depth study, it was found that – although ELEs are now widely available – that only 4 out of 10 teaching staff members really have integrated the ELE as a support provision in their instructional activities (Schoonen, Roozen, Sligte & Klein, 2004). This clear contrast between provisions, plans and actual usage is symptomatic for a set of problems that point at issues related to institutional management and policies. In this contribution, we will ‘dissect’ the complex state of the art related to ICT in higher education, based on recent studies set up in the Netherlands, Flanders and other Western European countries. In the next part of this paper, we will look at ways to move ICT in higher education into a more comfortable zone for institutes and policy makers.

The ‘uncomfortable’ zone for institutes and institutional policies

ICT touches the ‘heart of the educational matter’

The most recent trend report of SURF, the collaborative organisation of all IT facilities for universities and higher professional institutes in the Netherlands, for the period 2003-2006 is entitled ‘The Heart of the Matter’. It proposes a new policy for the use of ICT in higher education and research that moves away from an innovation targeting ICT applications to a process oriented innovation approach. SURF (2003) asks for developments in support provisions within and between institutes. A typical case in this context is the large adoption of ELEs in higher education institutes. SURF (ibid, p.15) comes to the conclusion that the large scale introduction of ELEs has put the institutes in a critical position that by far exceeds technical problems:

- The lack of standardisation makes institutes reluctant to develop or acquire content.
- To guarantee that no content is lost when moving from one ELE to another, current content is to be stored in a technology neutral format.
- To fully exploit and manage educational information and content, there is the need to use a content management system. But most institutes have hardly moved in that direction.
- An ELE only becomes efficient when it is linked to other back office systems, such as LDAP systems that contain information about students and staff, or student tracking systems that monitor student progress throughout their study.
- There is insufficient time and money for professional development of teaching and support staff. Progress therefore depends too much on the individual demands, needs and activities of these staff members.
- Authentication and security presents all the sudden, institution wide problems.

SURF (2003) presents as a key solution: collaboration at the level of IT systems and competition at the level of education and services. A typical example of the former is the recently signed agreement between all higher education institutes in the Netherlands to develop a shared virtual student administration facility. This *Virtual Clearinghouse Higher Education* (VCH) will allow the development of a universal student identification code. The VCH works as a kind of information broker that ‘clears’ information from different sources (e.g., university student administration) and makes it available through one single facility. When we compare this to the way institutes struggled until now with their own individual legacy systems, that hardly could be linked to one another and/or linked to external systems, this new situation makes a huge difference. Another example is how there is now a growing trend in the development of *Educational Service Provisioning* (ESP). Comparable to the growth in *Application Service Provisioning* (ASP), institutes now offer or procure educational applications from shared central resources or service organisations. A typical example of ESP is how ELEs are set up in higher education institutes. For example, the Karel de Grote Hogeschool in Antwerp (Belgium) does not run its ELE on their own servers, but procures this as a service from another organisation. This gives the ICT staff more time to focus on process support in the educational organisation.

These examples illustrate how ICT is no longer an issue that can be dealt with separate from educational, administrative and logistic issues. It explains partly why ICT has become an uncomfortable zone for institutes and policies. ICT is to become a core element of institutional and policy development.

Institutional policies and ICT: A recent analysis

In 2003 an in depth study of ICT and institutional policies and management was set up in higher education institutes in the Netherlands (Kop, van den Berg & Klein, 2004). In this study 2592 teaching staff members, 364 management representatives and 6973 students were involved. The Kools model (see Figure 1) was adopted to study the issue at micro- and meso-level. Student, teaching staff, de-central management (educational coordinators) and central management (vice-presidents, chancellors) were involved in this monitoring study. As can be derived from Figure 1, five clusters of variables and processes have been studied: Management, Expertise, Infrastructure, the Primary Process and Conceptions. The last cluster refers to perceptions, expectations, and opinions of staff and students about the impact and role of ICT in education.

The figure represents a complex interplay of variables that define the position of higher education as a result of ICT related issues. Different approaches, tactics, strategies or approaches are expected to result in a different position for a higher education institute. The variables and processes in the study of Kop et al. (2004) are in general comparable to those in the earlier international comparative survey of Collis & van der Wende (2002). In this study, based on the input of 693 respondents of 174 institutes in 8 countries, variation in dealing with the processes/variables is expected to affect the dependent variable: the emerging model of higher education. They distinguish 5 different models: (1) the ‘back to basics’ model that pulls back higher education to its established role and position; (2) the ‘stretching the – current - mould scenario’, in which institutes create a first level of flexible learning or (3) the ‘stretching the – future - mould scenario’, in which institutes strive after more flexible learning; (4) the ‘global campus’ model in which institutes are oriented towards distance education solutions, and finally (5) the ‘new economy’ model in which there is radical change in higher education institutes as market driven institutes. The results of this study will be discussed further in the article. But at a general level, the

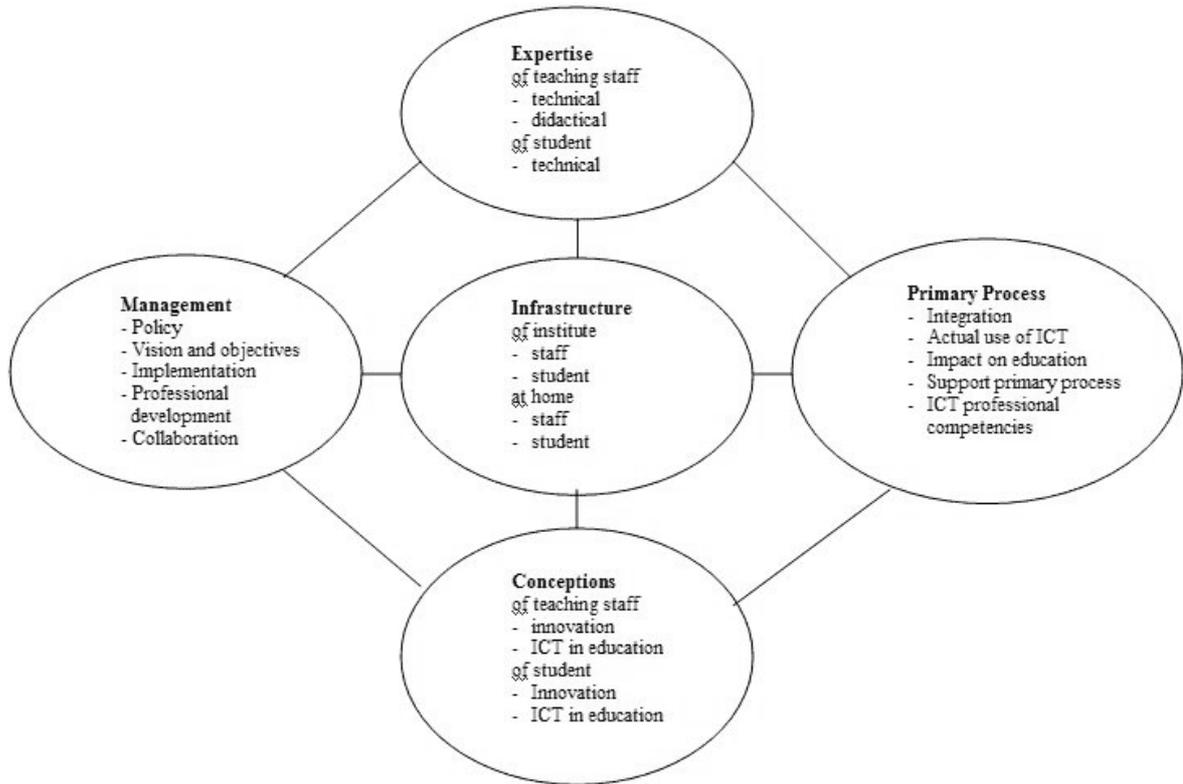


Figure 1: Analysis model to study ICT implementation in Dutch higher education
(based on Kools, Neut, vander Smeets & Vermeulen, 2002)

results can found as a summary in Figure 2 (Collis & van der Wende, 2002, p.52). At the left hand side the variables or processes are depicted that have been found to load significantly, based on regression analysis, on the 5 scenarios depicted at the right hand side. Overall, the current situation in most countries included in this study reflects a ‘stretching the current mould’ model.

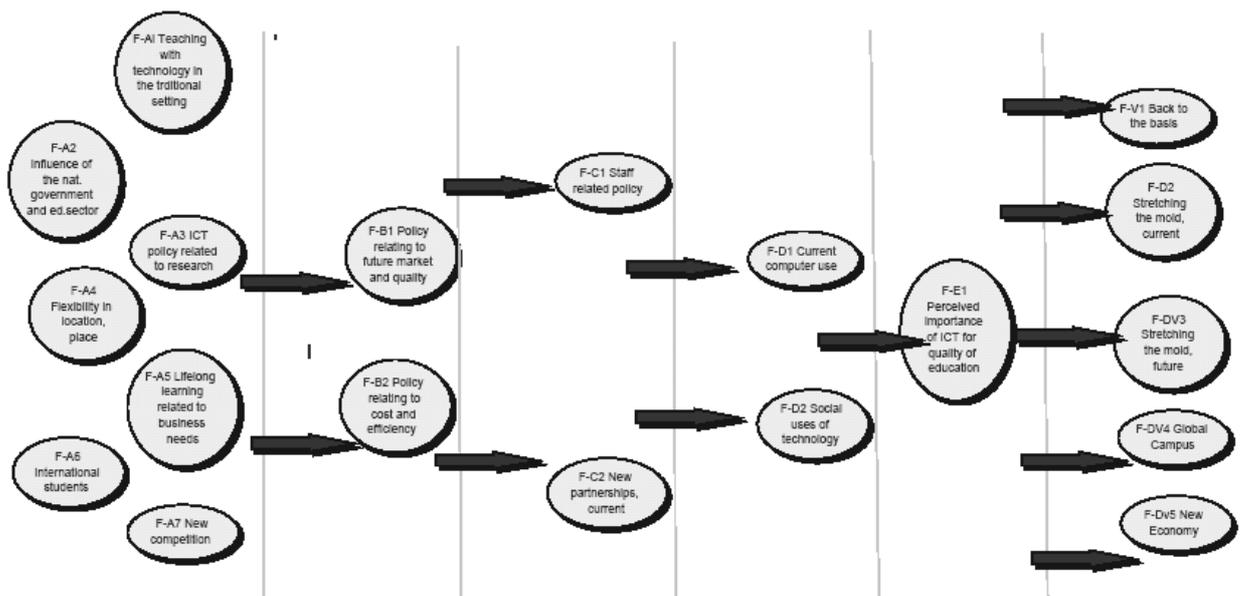


Figure 2: Factors influencing scenarios resulting from ICT policies
(based on Collis & van der Wende, 2002, p.52)

We return to this study and the scenarios at the end of this contribution. As stated earlier, the basic structure of the next paragraphs is based on the study of Kop et al. (2004). These results will be enriched with information from other researches in the Netherlands or other countries. Given the focus of the present contribution, 'management' will be at the centre of attention.

Management

As to the issue of ICT policy development, the results of the study are clear. Four out of five institutes have developed an institution wide ICT policy plan. Far more interesting is to study to what extent this policy is related to a clear educational 'vision'. About half and about 7 to 10 top managers of higher education indicate that the ICT policy is derived from an educational 'vision'. At a de-central level, managers indicate to a lesser degree that there is such a relationship. These results are congruent with the study of Collis & van der Wende (2002). In their international comparative study, 97% of institutes have developed an ICT related policy (countries involved: the Netherlands, Germany, the United Kingdom, the United States of America, Australia, Sweden and Finland). They also concluded that the actual ICT policies were too limited and hardly comprised "the actual (richer) pedagogical use of ICT" (ibid, p.8).

What about the question: Who is responsible for policy development? There is a clear friction in the opinion of top management and lower management as to who is responsible for defining ICT related policies. Top management points at the institutional level, de-central management points at the level of department/faculties, or at least the level of educational programs, to define ICT policies. The uncomfortable zone becomes especially apparent when the researchers found that only about 20% of teaching staff have been involved in policy development. The 'friction' becomes even clearer when top management is asked who is responsible for carrying out the ICT policies. The majority (3 out of 4) points at the de-central level (level of the educational programmes). This approach seems to be shared by many institutes in Western Europe. In the study of Collis & van der Wende (2002) most countries reflect institution wide ICT policies that serve as a framework for faculty specific plans. In only 19% of the cases there was a bottom up approach to policy development. In most cases (54%) there is a combination of bottom up and top down approaches. The study of did not focus on student involvement in ICT policies. The study of Cordewener, van de Gruiter & Keyijzers (2002), based on workshops and round tables with students from different Dutch universities, indicates that students ask for a higher involvement in decision making about choices for ICT functionalities.

At a next level, the research moved to a discussion and analysis of the objectives in the context of an ICT policy. Overall, the objectives put forward in ICT policies are more related to 'substitution' or 'optimisation' of current educational processes, and to a lesser extent are related to 'innovation' or 'transformation' of teaching and learning and related processes.

When management is asked to what extent the objectives have been attained, the highest success rates are observed in relation to optimisation of the information provisions, better communication between student and teaching staff. It is interesting to note the high level of disagreement between the perceptions of top management (87%/55%) and de-central management (39%/47%) and teaching staff (20%/27%) as to the extent the quality of education has improved or education has been innovated. The researchers do not present explanations for these contrasting opinions; but the figures suggest that the discrepancies can be expected to affect other variables and processes in this context.

The results are in line with a number of recent studies in higher education. Collis & van der Wende (ibid, p.9) conclude that: "Overall it seems that higher education institutions do not expect revolutionary change as a result from or related to the use of ICT. In general, there is not really a concern about being forced to change by external forces or developments. Rather, a 'business as usual' approach is taken, without anticipating any real dramatic changes in mission, profile or market position. Nevertheless, institutions are gradually 'stretching the mould'; they change their procedures and models as a process of change from within. These changes, however, are gradual and usually slow and may comply with the slight changes in needs and demands as perceived by the institutions."

Eurelings, Melief, & Piekenpol (2001) conclude in their study that the developments have hardly impacted the actual teaching approaches. They are dominantly teacher centred and little attention is paid to the full exploitation of communication facilities and interaction. And the study of Kools et al. (2002) confirms the pre-dominant role of ICT to facilitate information and administrative processes. Laga, Clement & Buelens

(2002) logged all the key strokes of students during a complete academic year when using Blackboard. Analysis of the millions of keystrokes – for 569 courses - helped to clarify in a very operational way which ICT functionalities were actually offered to and used by the students: 88.7% of the keystrokes were document related (downloading Powerpoint presentations and texts), 11% were related to assessment functionalities and 0.4% were related to communication.

When analysing current ICT policies it is remarkable to note that little is written about the impact of ICT on the strategic position of the educational institutes. Collis & van der Wende (2002) point out that there is hardly a focus on the needs of specific groups of students: “But in particular the strategic use of ICT for the diversity of higher education target groups will require explicit policy development. More concretely, institutions should develop a strategic plan relating to the relative importance to the institution of the different types of learners in the post 2005 period and should consider the corresponding technological architecture, tools and functionalities.” (ibid, p.9). In this context it is relevant to point at the critical state of the UK's e-universities Worldwide (UK e-U), an initiative of the UK government, 12 universities and profit organisations. Started in 2003, it aimed at attracting 5600 students, but failed in doing this and attracted by May 2004 only 900 students from 38 overseas countries. The problematic state of the UK e-U, partly explained by the dot-com crash, especially points at underestimating management issues (see later in this contribution) and weak pictures of the kinds of students expected to enrol.

Student opinions about the focus of ICT policies stress the importance of an educational philosophy, a more integrated approach of ICT use, the social impact of ICT (digital divide), and the impact on flexibility in studying at the national and international level (Cordewener, van de Gruiter & Keyijzers, 2002). Students criticise the current state of affairs and do not report an overall positive attitude towards ICT related educational innovation.

We move now to the next issue in the model. How do institutes foster the implementation of their policies? It is clear from the study that specific budgets have been supplied to develop the ICT policies. At a next level, the ICT policies are, in order of importance, implemented through (1) establishing (ICT) standards for software and hardware; (2) exemplary projects or showcases and (3) fostering gradual change. The picture shows that a high level of attention is paid to technical issues as compared to educational change (the standards). The picture also suggests that the situation hardly reflects a ‘planned change’ approach. Individual staff members or educational programs put forward ideas to receive seed money or a grant to develop these ideas. The ICT policy is hardly linked to an institution wide implementation. The ‘good practices’ methodology is a dominant tactic in the Western European context (see e.g., the recent studies of Schoonenboom, Sligte, Elshof, Emans & Roozen, 2004b; Schoonenboom, Roozen & Sligte, 2004a; and Schoonenboom, Roozen & Sligte, 2004b). In the next section about the development of a more comfortable zone for institutes and institutional policies, we will return to this issue. In the latter context, the grassroots approach will also be cited.

A next issue at the level of management is professional development. In the research of Kop et al. (2004), both top management and de-central management indicate that professional development of teaching staff is a key element in their ICT policy. Analysis of the approaches reveals that the policies consist of (1) training of teaching staff; (2) providing a helpdesk; (3) access to the university facilities from home; (4) financial plans to buy a personal PC and to a lesser extent (5) giving extra time to work with ICT. The same applies to the support of students (with the exception of policy action 4).

But, when we approach this issue from the perspective of the teaching staff, a completely different picture emerges: (1) only 50% indicate that there is sufficient technical support; (2) only 46% indicates that sufficient training has been given; (3) 41% reports that sufficient time has been made available to work with ICT and only 28% states that there is sufficient didactical support to work with ICT in their instructional setting. These results are also typical for the situation in other countries. It is especially the last element in professional development that causes the critical state of ICT in higher education. This is strange since the e-learning literature is very clear about the clear impact of the integrated use of ICT on teaching responsibilities and roles. Midkiff, DaSilva & Plymale (2002), for example, describe a number of new ICT related roles, such as “content expert, instructional design, instructor of record, distance learning instructor and technical support”. And Salmon (2000) points at roles and tasks that are related to “understanding of online process, technical skills, online communication skills, content expertise and personal characteristics”.

The international comparative study of Collis & van der Wende (2002) also considers the critical position of professional development and the very uncomfortable position of management in this context. They state, “Instructors: Gradually doing more, but no reward (ibid, p.35).” They detect that staffing policy is hardly related to ICT issues. Respondents (both management members and teaching staff state that only a little to no consideration is given to the following human resource issues (scores between bracket or mean scores of ratings on a five point scale; 1= Not at all – 5 = very much).

- ICT competencies are systematic criteria for selection and recruitment of new staff (2.6).
- ICT use in education is part of a regular quality assurance exercise (2.2).
- ICT use in education is an integral part of regular staff assessments (2.0).
- Professional development of staff in ICT competencies is mandatory (1.9).
- ICT use in education counts towards promotion and tenure (1.9).
- Financial incentives to individual staff are provided for development of ICT use in education (1.9).
- ICT use in education is mandatory (1.8).

In general it can be concluded that ICT plays only a modest role in institutional staffing policies and is often valued as having little to no role. Incentives and reward for staff are lacking in this context. This lack of reward structures is evident at an international level (see for an exemplary overview the EDUCAUSE study of Hawkins, Rudy & Madsen (2004).

Part of the explanation for less powerful approaches towards professional development is related to the relatively young status of what is called ‘digital didactics’. Only recently, approaches can be observed to develop digital didactics (see e.g., D’haese & Valcke, 2004 and Simons, 2004).

Collaboration is a central part in most ICT policies in Dutch higher education. All top managers, representing the universities and higher professional education institutes indicate that collaboration with other higher education institutes is an upfront feature of their policies.

But the picture is again different when de-central management is interviewed. In order of importance they indicate the following types of collaboration: (1) 68% works together with other department/faculties within the same institute; (2) 46% indicates that they work together with other higher education institutes; (3) 23% works together with companies and (4) 10% joins forces with non-higher education institutes (e.g., adult education or secondary schools).

From the study of Collis & van der Wende (2002), we can learn that collaboration between higher education institutes is considered as a central issue for the current situation and in the near future. But the same study also reveals that management also reports that at the same time competition with other institutes will become as important and influence current and future ICT policies. The former suggests that collaboration is a sensitive issue. In the Dutch context collaboration has been fostered by the central government in view of innovation based on ICT. The yearly project tender of SURF with its calls for project proposals is a typical example of the latter. Projects should reflect collaboration between at least two different educational higher education institutes (see for a description of the approach SURF (2004 and see for an overview of collaborative projects: http://www.surf.nl/projecten/index_lijst.php?pfo=63)

A recent analysis of the SURF innovation projects points out that this collaboration is a key feature of these projects (van den Bergh, 2003). And a recent audit of these projects (Van Hooff, 2002) confirms the impact of SURF projects when it comes to institutional exchange of experiences.

But despite the potential of collaboration, recent developments have pressurised the situation. The last call for project proposals has elicited fewer proposals. Moreover, the overall number of institutes has dropped. Especially in universities, bigger faculties and already well established partnerships seem to be able/willing to further ICT based innovation in collaborative context. Financial constraints are partly the reason. Project funding is based on shared costs (50%/50%).

Admiraal, Droste & Jorg (2002) refer to the lack of collaboration between staff members to explain the low level of educational innovation based on ICT. This is a very specific issue that returns in many studies about ICT in higher education. At the organisational level, teaching staff members remain ‘soloists’ when designing, developing, and implementing ICT applications. According to Simons (2004) fostering collaboration between teaching staff, teams, or departments is a key element. He refers to promising

approaches like assigning ICT buddies to staff members, developing e-portfolios of staff members, and explicit evaluation of teaching activities based on ICT.

Quality assurance was not mentioned in the study of Kop et al. (2004), but is nevertheless an emerging topic in policy related discussions about ICT in higher education. Dillemans, Lowyck, Van der Perre, Claes & Elen (1997) drew attention in an early publication to the need to establish new quality criteria and quality assessment procedures in view of paying in a balanced way attention to the new emerging ICT related educational policies.

Boerzerooy & Gorissen (2003) indicate that quality assurance is a neglected factor in Dutch e-learning approaches when it comes at looking for concrete tools, instruments or models. But they refer to European collaborative initiatives that can help to promote or develop local approaches: the European Quality Observatory (EQO), the Sustainable Environment for the Evaluation of Quality in e-Learning (SEEQUEL), the Quality of e-Learning project (QUAL) and the Supporting Excellence in E-Learning project (SEEL) (see for more information the references at the end of this contribution).

Primary process

Under this heading, the study of Kop et al (2004) focuses on the actual adoption and integration of ICT in teaching and learning processes. It is not unexpected that there is a clear and significant difference between the level of importance attached to certain ICT functionalities, and the extent to which they are used in daily instructional practices. Table 1 gives a summary of some of the results. The percentages refer to the percentage of respondents that rated this functionality as ‘very important’ to ‘important’. The most striking differences are printed in *italics*.

Table 1: Percentages of de-central management members and teaching staff rating functionalities as (very) important; comparison of perception and actual use (based on Kop et al., 2004, p.37)

	Appreciation/importance of the ICT functionality		Actual use of the ICT functionality	
	De-central management ^a	Teaching staff ^b	De-central management	Teaching staff
Giving organisational information about courses	93.5	86.5	74	72.5
Registration and follow up of student learning activities	84	74	60	47
Information about staff and participants	85	81	67	59.5
Subscription for exams	83	75.5	72.5	67
Communication about the instructional process	68	61.5	40	37.5
Collaborative learning	59	52	15	19
Self assessment	57.5	58	6.5	9.5
Determining an individual learning path	48	28	17	37
A discussion forum or platform	44	35.5	12	9.5
Final assessment	41.5	50.5	16	21
Distribution of learning materials and tasks for self study	50.5	64	31	38.5
Collaborative activities/projects for students	45	57.5	35	41

^a n = 333

^b n = 2592

The results reflect what was found earlier in the study of Collis & van der Wende (2002) at the international level. ICT applications do not reflect a revolutionary change in teaching and learning approaches. The actual ICT use fosters logistics and administrative processes, distribution of materials and communication about instructional issues. The expected impact on collaborative learning, the emerging trend in higher education (see Valcke, 2004), is only found at the level of collaborative

activities. When we analyse the applications used to support these functionalities, it is noteworthy to indicate that email is the key tool to support this activity; despite the fact that discussion forums are available in most ELEs. Groupware provisions that offer far better and advanced functionalities are mentioned by a marginal percentage of respondents. The findings corroborate the findings of the earlier study of Lubbermans & Klein (2001).

The findings are striking. In the literature about ICT and education ICT, new educational provisions are being put forward, such as e-portfolios, electronic problem based learning, simulation and games, and electronic master thesis support provisions. Browsing through the catalogue of SURF projects, or the comparable project database of the Joint Information Systems Committee (JISC) that brings together UK based higher education initiatives, reveals a rich variety and potential to promote very advanced and challenging ideas. But, dissemination and the up scaling of these initiatives remains a challenge, both for the project partners and the national bodies who supported the design, development and initial implementation of the IUCT based innovations.

Conceptions

A recent international analysis of teacher training approaches related to ICT puts forward a list of operational benchmarks for ICT in teacher education (Kirschner & Davis, 2003).

The following benchmarks were dominantly found after analysis of 26 case studies in ICT teacher training: (1) Master a range of educational paradigms which make use of ICT and (2) master a range of assessment paradigms which make use of ICT. The study of Kop et al. (2004) indicates that most teaching staff members indicate that little to no attention is paid to attitudes towards ICT during e.g., professional development activities. Earlier studies that focused on conceptions of learning and ICT come to the same conclusions. Admiraal, Droste & Jörg (2002) based their research on interviews with teaching staff and experts. When interviewing members of management they had to conclude that these actors had difficulties in pinpointing the relationship between ICT functionalities and the educational objectives. They discovered a very technical orientation towards ICT. The researchers conclude that there is lack of a clear educational concept, e.g. based on social constructivism. Also in the interviews with teaching staff, it was concluded that the major conception about ICT and learning is related to efficiency, efficacy and satisfaction in view of the existing aims of education. The respondents hardly put forward conceptions that go beyond the current educational situation; such as active learning, experiential learning, and collaborative learning. This general conception of ICT based learning can also be derived from the title of a recent workshop with the medical faculty of a large Dutch university: *ICT in higher education: added value or added cost*.

There is clearly an uncomfortable zone for management and institutes in this context. The study of Kop et al. (2004) comes to the conclusion that top management indicates that there is only a low to average percentage of teaching staff that strongly supports ICT based education. The opinion of top management about the percentage of staff members who strongly support educational innovation in general is even lower. These findings question the validity of approaches and decision of top management when it comes to ICT and education and questions also the level of communication between these actors in educational institutions. Hardly dealt with is the impact of educational innovation with ICT on the workload of staff. In the audit of a large number of innovation projects in the Netherlands, van Hooff (2002) concludes that in relation to 57% of the projects, a significant increase of workload of staff using ICT in education was reported. This influences the attitudes towards and commitment of staff in future innovation projects and affects the scalability of some projects.

At a different level, the conceptions of students about ICT and education are very positive. But they are extremely critical about the educational use of ICT by the teaching staff. Only one third of respondents are positive about the educational use of ICT by teaching staff. The other students are extremely negative about the approaches adopted and the skills demonstrated (Schoonenboom, Rooze, Sligte & Klein, 2004). The students also report that, despite the implementation of ELEs, their education has hardly changed (Cordewener, van de Gruiter & Keyijzers, 2002). The same authors also report that student do not really expect and wait for a radical innovation in their education. Nevertheless, other research points at the critical impact of student conceptions of learning and their appreciation of ICT based learning environments. For instance, Schellens (2004) could detect a significant impact of positive attitudes, and the high appreciation levels of collaborative learning environments on academic performance.

Infrastructure

In the preceding paragraphs a number of issues have already been discussed about the available technical facilities in higher education institutes and the way it challenges management and policies. Additional points of concern are related to the impact of earlier technical choices and the way they have ‘immobilised’ new developments in some higher education institutes. In the Dutch and Flemish context, a majority of institutes have opted for a specific commercial ELE. This choice resulted in a structural commitment and budgetary consequences that prevent these institutes to reorient their approaches. When these institutes want to refocus their attention to e-portfolios, groupware provisions, simulation and games, and others they are limited by the technical constraints of the available ICT provisions, or limited in budgets. Other institutions have not invested in commercial solutions but have adopted an open source solution (such as Bodington, Claroline, FL3, Moodle, U-portal, etc.) or have opted for standardised solutions to store their educational content (see for an overview of recent trends: van Geloven, Koper & van der Veen, 2004).

Striving after a comfortable zone for institutes and institutional policies

The critical position of middle management

The preceding paragraphs depict a complex picture of ICT in higher education, resulting in a rather ‘uncomfortable zone’ for institutes and policy makers. In the following paragraphs we discuss a number of approaches, strategies and solutions that have been put forward to foster a more ‘comfortable zone’. Again the overview is especially based on Dutch, Flemish and the Western European context in general. It is important to warn the reader. This overview is – yet – not presented as a structured set of solutions or approaches. Moreover, the experiences might even sometimes not be transferable to other institutes, depending on contextual differences. The overview is rather a list of priorities that is to be considered when attempts are made to move away from the less uncomfortable zone.

Building on a critical policy analysis of the Flemish context, Valcke (2003) recommends the following lists of ‘ways forward’ to promote the integrated use of ICT in higher education. He distinguishes between macro-level issues, pertaining to the regional, national and international of individual educational institutes and meso-level issues that focus on intra-institutional elements.

Macro-level

- Foster collaboration between institutes;
- ‘Seed money’ is crucial to start up innovations in HE, but care should be taken as to:
 - Accompanying measures should also be supported, and this to a very large extent. The latter is especially true for support actions such as dissemination, expertise exchange;
 - conditions that promote collaboration between institutes, between Higher professional education and universities, the application of industry standards;
 - staff training as an integral part of projects;
- Involve the existing umbrella organisations to promote the ICT based innovations;
- Start up and promote national evaluation and monitoring activities;
- Redefine innovation project tenders that pursue Educational innovation based on ICT;
- Define internal and external quality assurance cycles.

Meso-level

- Define an educational policy and related ICT policy;
- Foster collaboration within the HE institute (between faculties, departments, ...);
- Focus on initiatives that are scalable;
- Extrapolate the administrative, logistics, technical consequences of ICT projects. This implies that the projects should start as early as possible to negotiate with departments that ‘own’ crucial information about students, staff data, rosters, calendars, ...
- Set up an internal quality control cycle;
- Foster collaboration with other HE institutes; e.g., in the context of ‘associations’;
- Invest in a significant way in central support (helpdesk, training, documentation, registration, authentication, ...);

- Discuss and determine the consequences of educational ICT use for the human resource management: incentives for staff, staff development, specialisation, new job profiles, etc.

What is remarkable about this overview is that it is assumed that there is an explicit and active involvement of policy makers in innovation processes based on ICT. We return to the meso-level issues later in this contribution. We focus now rather on the macro-level issues.

Macro-level issues in higher education ICT based innovation

Considering the list of Valcke (2003), presented above, collaboration is the dominant theme underlying most items. It is a recurrent theme in Western European higher education institutes when it comes to ICT related educational innovation. Collaboration is a way for institutes to cope with the uncomfortable zone in relation to ICT and educational innovation. But collaboration even goes beyond this issue. In Flanders and the Netherlands, there is a very strong focus on this issue. In Flanders e.g., higher education institutes have been obliged, by law, to form large higher education clusters, called *associations*. This has substantially changed the higher education landscape. The 5 universities and 24 higher professional educational institutes are now reduced to only 5 *associations*. There are a number of drawbacks and negative consequences related to this recent institutional collaboration. But on the positive side, there is now more ‘internal’ expertise available that might help to direct ICT based educational innovation processes. The same type of collaboration is observed in the Netherlands. Universities and higher professional education institutes create structural and functional relationships that in a number of cases result in the merging of institutes (e.g. University of Utrecht and Hogeschool Utrecht). This tendency or obligation to collaborate is also found in ICT based innovation projects.

In the Netherlands, the government, through the SURF organisation, gives institutes the opportunity to submit projects in relation to the SURF educatie<F> tender. In 2004 a total of 2.1 million EURO was available to support projects on a 50%-50% shared cost basis. A key condition is that the projects are submitted by consortia of universities and/or professional higher education institutes. The projects have to be approved at top management level and have to be linked to an explicit institutional ICT and education related policy/strategy. Other criteria refer to the definition of an operational dissemination and evaluation approach, the obligation to work develop innovative ideas at programme level (not at course level), a minimum financial size (500.000 EURO) and the development of spin off activities such as professional development, publications, etc. A recent independent audit of the SURF Educatie<F> initiatives, involving both HE institutes with and without this type of projects, points at the high satisfaction level of institutes about the collaboration (van Hooff, 2002). The audit also reveals that the collaboration has had a significant intra-institutional impact related to (1) a big increase in the time and money spent on educational innovation; three quarters of the institutes report a real change in educational practices; and (2) the partners report that – even more than the actual products developed in the projects – they appreciate the ‘lessons learned’ and the catalyst effect of projects; and (3) they were inspired to redirect their institutional policy/strategy, to focus more on professional staff development and the technical updating of the IT infrastructure.

In the previous paragraphs institutional collaboration was rather project based. In a next phase, we observe in the Western European context more structural and formal levels of collaboration in relation to ICT based educational innovations. The collaboration of UK institutes in the context of JISC is a first example. But in the Netherlands a completely new type of collaboration has emerged: large consortia of institutes with an explicit focus on innovation of higher education via ICT. Up to now three consortia have received approval and extra money from the government to develop their activities: *Apollo* (4 institutes); the *Digitale Universiteit* (10 institutes); and *E-Merge* (7 institutes). The collaboration is not only inspired by economical reasons (to save money), but to bundle expertise, to develop communities of practice, to develop reusable resources, and to develop management tools and practices (see further in this contribution). The three consortia can be considered as project driven organisations.

In the list of Valcke (2003), quality control and monitoring can be considered as somewhat unrelated to the collaboration issue. But in the Western European setting, quality control systems and monitoring are organised in collaborative settings. Most countries have adopted a system of recurrent ‘visitations’ of educational programs. The quality framework directing these initiatives has been updated and includes

now the topic of ICT in education (See VLIR and VSNU for the specific approaches adopted by universities in Flanders and the Netherlands).

Project based and formal structural collaboration between institutes is also observed at the international level. In Europe, there is an already long tradition of collaboration in higher education in view of ICT and education. The European Commission is in this perspective the *nestor* of international collaboration that fosters both research and development activities. We recommend consulting the website about the latest IST program of the European Commission (Information Society & Technologies). The potential for international collaboration has now been boosted by additional programs to involve non-European partners, such as US, Asian and Australian higher education and research institutes.

The central position of middle management in change management processes

In the recommendation list, presented above, a proportion of action points were related to decisions, activities, recommendations that are related to management at the institutional and intra-institutional level. It is significant that also the EDUCAUSE conferences have picked up this theme since 2002 (ter Borg-Spitholt & Wijbenga, 2003 and Hawkins, Rudy & Madsen, 2004). A critical point of discussion in this context is who we are talking about when we focus on 'management', top management or de-central management? In the context of the studies referred to, all authors point unanimously at the key position of de-central management. They are close to the educational programs, faculties and departments and the key persons that influence policy development and implementation in direct interaction with micro-level actors (staff, students, tutors, researchers ...). Next to taking decisions about the innovation strategies, within the critical boundaries of available resources, middle management is expected to develop 'change management' policies. This is a rather neglected area in the management of innovation processes in higher education settings.

Above, reference was made to the SURF Educatie<F> projects. The 2004 Tender attracted less project proposals than before. Moreover, only 1.5 million of the available 2.1 million grant was used to support projects. The main critique of the review board was that despite the fact that most projects presented challenging ideas that affect both educational, and organisational elements of higher education, a significant number of the projects was immature. Many project proposals were not accepted because the clear and operational role of ICT in the educational processes was hardly defined at the meso- and micro-level. This can be brought back to the specific responsibilities of middle management. The awareness of the role of middle management has inspired the development of specific expertise and tool development projects.

Change management

To develop and foster expertise development in view of change management practices, a number of initiatives have been taken. In the JISC grant system partnerships can submit project proposals related to: "*organisational models*, typically describing the business process of a learning organisation, and designed to ensure processes are evolved to make best use of learning systems; also best practice standards at the organisational level such as QA documents and CPD frameworks for managers." (JISC, 2004, p.4). In the Dutch context, the consortium the 'Digitale Universiteit' (see above), has launched a specific track in their inter-institutional program to develop the expertise of actors at the level of middle management, e.g., the program coordinators, faculty board members, etc. Next to workshops, a knowledge database, workshops and a manual, also screening instruments have been developed to foster the change management capacities (see e.g., Boezeroy, Ritzen, Romijn, Bosschaart, Hofman, Nijveld & Dekker, 2004). The overall approach is based on a management cycle, made up of five phases: (1) problem definition/drafting the agenda; (2) Management preparation (environmental analysis and defining a strategy); (3) Determining operational management objectives; (4) Implementation (project based implementation); and (5) Evaluation and feedback loops. To help ensure that middle managers are not lost in this process, the project has developed cases, scenarios and concrete tools/instruments that help to carry out the management activities. The projected benefits of this approach are that middle managers are less concerned about the actual micro-level implementation issues, but focus rather on middle and long term planning, take into account the full complexity of the variables and processes affected by the innovation and are more concerned about creating favourable conditions to support the educational

innovation. In this context, there is a larger awareness of project development, professional development, infrastructure, budgeting and follow up activities.

The good practices approach

A variety of implementation strategies has already been presented throughout this contribution to foster ICT based educational innovation in higher education: collaboration, internal project tenders (within an institute or partnership), and national and international project tenders. During the last two years especially the good practices approach has been promoted (Schoonenboom, Roozen & Sligte, 2004b). The good practices approach builds on national and international practices and is inspired by the critical observation that educational policies are difficult to translate into educational practices (Kirschner, Wopereis & van den Dool, 2002). The good practices are positioned as the *missing link* in this process (see also Skyrme, 2002). In the Netherlands this has inspired SURF since 2001 to start up the development of a national good practices project, communicating through the SURF website.

More recently (2003), a further development is grassroots projects (Cordewener, Javobi, Lubberding & Schoenmakers, 2004). Three higher education institutes were supported to start up this type of project. The projects focus on micro-level initiatives of individual or groups of teaching staff members that use ICT in a very concrete way in their courses. Next to the exemplary nature of these projects, they are especially put forward as a key to promote the active involvement of teaching staff and as a reward system for their involvement in higher education innovation. Teachings staff engaged on selected projects receive a 500 EURO bonus or a digital camera. In 2004 over 100 grassroots projects were approved. The evaluation shows why the projects are successful: (1) the projects build on bottom up approaches; (2) they build on what teaching staff is actually coping with; (3) they foster the visibility of the initiatives and (4) the projects fitted in the existing educational approaches at institute level.

Communication and dissemination

The good practices example introduces another key element in coping with the uncomfortable zone in higher education: communication. The project tenders discussed before, both at the national and international level, all incorporate communication as essential for the project development and evaluation. In the SURF context, 15% of the project budget has to be spent on communication and evaluation activities.

Nevertheless, in the Dutch context, it has been argued in the past that communication was too critical to be dependent on the initiative of a single project, institute or consortium. Therefore, a significant amount of central money has been reserved to develop and implement communication about ICT and educational innovation. In the European context, these communication facilities are exemplary. SURF has developed a variety of communication oriented initiatives under the umbrella of the SURF Educatie<F>orum: regular workshops (hands on), meetings (theme related network tables about e.g. digital portfolios and competencies, thematic conferences), educational trips to international conferences (e.g. EDUCAUSE, and Online-EDUCA), and a website (EDUSITE), and a platform to distribute digital learning materials (ESPELON). A critical characteristic is that the initiatives are focused upon specific audiences (teaching staff, top management, IT specialists, researchers, etc.). The audit of Van Hooff (2002) has also centered on these initiatives. She concluded that higher education institutes participated to a high and very high extent in these communication related initiatives. Key reasons to be involved were related to (1) building up networks with new partners; (2) staying updated; (3) finding new ideas, to be inspired and (4) for benchmarking purposes.

Directing educational change

As stated earlier, the overview in this contribution has been presented as a list of priorities to move away from the less uncomfortable zone. A more structured, planned, and systematic approach is yet to be developed in view of educational innovation in higher education. In this context it is useful to refer again to the study of Collis & van der Wende (2002) that aimed at defining models of technology and change in higher education. Their study is one of the rare examples in which scenarios have been defined to attain a specific future model: the 'back to basics' model, the 'stretching the – current – mould' scenario, the 'stretching the – future – mould' scenario, the 'global campus' model and the 'new economy' model. Building on multiple regression models, they have tried to design policy strategies that might predict the

attainment of a specific future scenario. In their analysis of management practices they distinguish between an evolutionary approach and an interventionist approach (see Collis & Gommer, 2001, for a more detailed elaboration). Figure 3 depicts in what way institutes differ, are similar and are different in making innovation related decisions, and how this is indicative of an evolutionary or interventionist approach. At the same time the picture indicates how this might predict a future scenario.

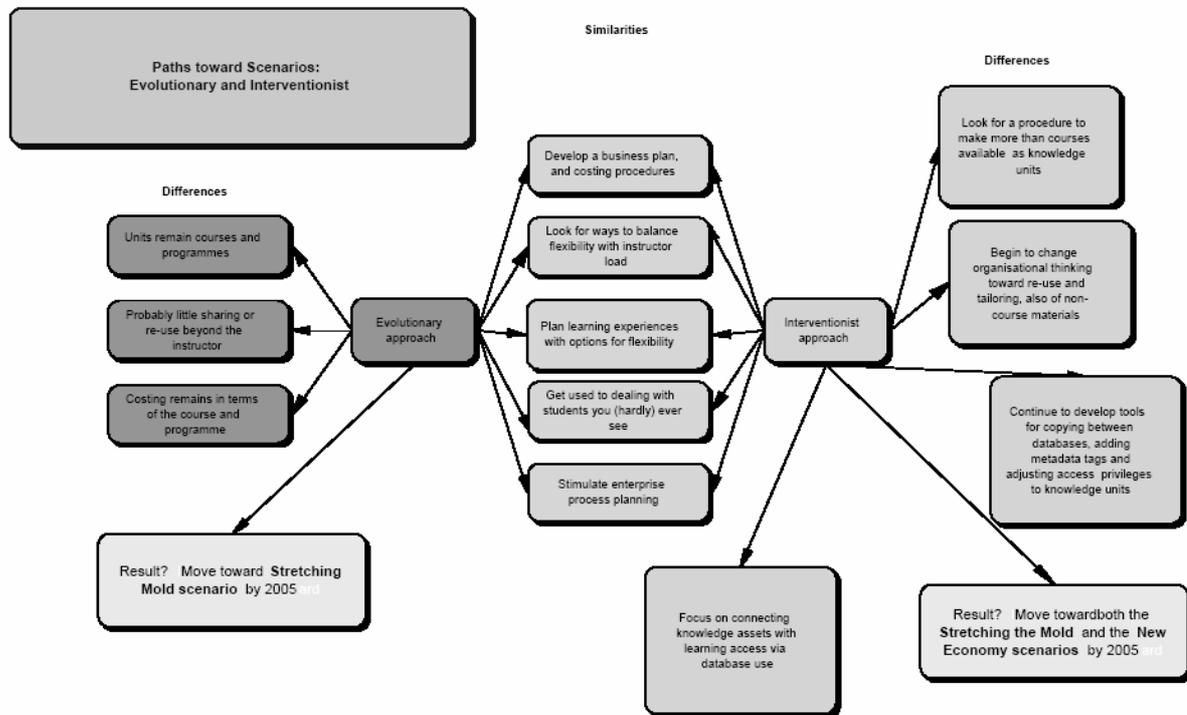


Figure 3: Comparison of policy strategies that influence the attainment of specific future scenarios
(Based on Collis & van der Wende, 2002)

The results of the study by these authors can be questioned. But in the context of developing ICT related policies in view of educational innovation, the results help to orient both top management and middle management actors. As has been stressed earlier, the results reinforce the earlier statement that change management expertise is crucial and should be developed as a first priority in higher education institutes.

General conclusions

The approach adopted in this contribution aimed at detecting, in the Western European context, relevant indicators of the uncomfortable zone for institutes and their policies in the context of ICT and educational innovation. In my opinion, the resulting picture points at key responsibilities at macro- and meso-level in higher education. At macro-level, a number of strategies and initiatives were presented to develop more favourable conditions for higher education institutes to cope with the new demands of ICT and educational innovation. But, more important are developments at the institutional level in general and the middle management actors in particular. The development of their change management skills was presented as a key to empower higher education to move forwards in this field and to develop a more comfortable zone for higher education

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URLs of interesting organisations, initiatives or websites, referred to in this contribution

- Apollo: <http://www.apolloplatform.nl>
- Claroline, an open source solution for an electronic learning environment: <http://www.claroline.net/>
- Digitale Universiteit: <http://www.du.nl/>
- EADTU European Association of Distance Teaching Universities: <http://www.eadtu.nl/>
- EDUCAUSE: <http://www.educause.edu/home/720> ; core data summary reports can be downloaded from the resource centre website: http://www.educause.edu/Browse/645?parent_id=101
- EDUSITE: <http://www.edusite.nl/>
- E-Merge: <http://www.e-mergeconsortium.nl/>
- ESPELON: <http://www.espelon.nl/>
- European Quality Observatory (EQO): <http://www.eqo.info/>
- Good Practices website of SURF: <http://goodpractices.surf.nl/>
- Grassroot project in the Netherlands: <http://www.grassroots.nl/>
- Grassroot projects in Canada: <http://www.schoolnet.ca/grassroots/>
- ICTMONITOR in the Netherlands: <http://www.ictmonitor.nl/english/index.html>
- International collaboration in IST programmes: <http://www.cordis.lu/ist/international/home.html>
- IST Information Society Technologies (European Commissions Projects): <http://www.cordis.lu/ist/>
- Joint Information Systems Committee (JISC) and ICT-based educational projects: <http://www.jisc.ac.uk/index.cfm?name=projects>

Online EDUCA: <http://www.online-educa.com/en/>
Open Source software for ELO: Project of Commonwealth of Learning: http://e-learning.surf.nl/docs/e-learning/col_lms_open_source.pdf
Quality of e-Learning project (QUAL): <http://www.qual-elarning.net/>
Supporting Excellence in E-Learning project (SEEL): <http://www.seelnet.org/seel/Project/default.htm>
SURF Stichting Universitaire Rekenfaciliteiten: <http://www.surf.nl/wtr/en/> and
<http://www.surf.nl/en/oversurf/index2.php?cat=Platforms&oid=24>; information about the SURF projects can be found via www.surf.nl/projecten
Sustainable Environment for the Evaluation of Quality in e-Learning (SEEQUEL):
http://cedefop.communityzero.com/elearning_forum
UK e-universities Worldwide: <http://www.ukeu.com/>
Virtual Clearinghouse Higher Education: <http://www.surf.nl/themas/index2.php?oid=20>
VLIR: the structural collaboration of Flemish Universities in view of quality control, <http://www.vlir.be/>
VSNU: the structural collaboration of Dutch Universities in view of quality control, <http://www.vsnu.nl/>

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<http://www.ascilite.org.au/conferences/perth04/procs/valcke-keynote.html>

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