Roundtable

Information technology in higher education: emergent paradigms*

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Abstract

Changes in society call for changes in education. We discuss two sorts of changes, both relating to flexibility. One change involves the logistics of participating in education: using technology to bring the sorts of processes that we use in society for communication, information management, and document handling and presentation into the ordinary ways of interacting in higher education. Technology allows easy access to resources, sharing and collaboration regardless of time and distance. This leads to expectations from our students that the same efficiencies could also be used in education. The second sort of flexibility relates to new pedagogies. In particular, we discuss an approach to pedagogy where students find or create resources that they share with each other and that can be reused to extend the study materials in the course. This new kind of pedagogical flexibility makes both, a students and instructor co-contributors to the course.

Palabras clave

flexible learning, logistic flexibility, pedagogical flexibility, technology, change

Resumen

Los cambios en la sociedad requieren cambios en la educación. Analizamos dos clases de cambios, ambos relacionados con la flexibilidad. Un cambio afecta a la logística de la participación en la educación: el uso de la tecnología para aportar los tipos de procesos que utilizamos en la sociedad para la comunicación, el tratamiento de la información y el manejo de documentos y su presentación por las vías ordinarias de interacción en la educación superior. La tecnología permite acceder fácilmente a los recursos, compartirlos y colaborar independientemente del tiempo y de la distancia. Esto genera expectativas en nuestros estudiantes sobre el uso de la misma eficiencia en la educación. El segundo tipo de flexibilidad se relaciona con las nuevas técnicas pedagógicas. En particular, analizamos una aproximación a la pedagogía donde los estudiantes encuentran o crean recursos que comparten con los demás y que pueden ser reutilizados para ampliar los materiales de estudio en el curso. Este nuevo tipo de flexibilidad pedagógica convierte a los estudiantes y al instructor en cocontribuyentes al curso.
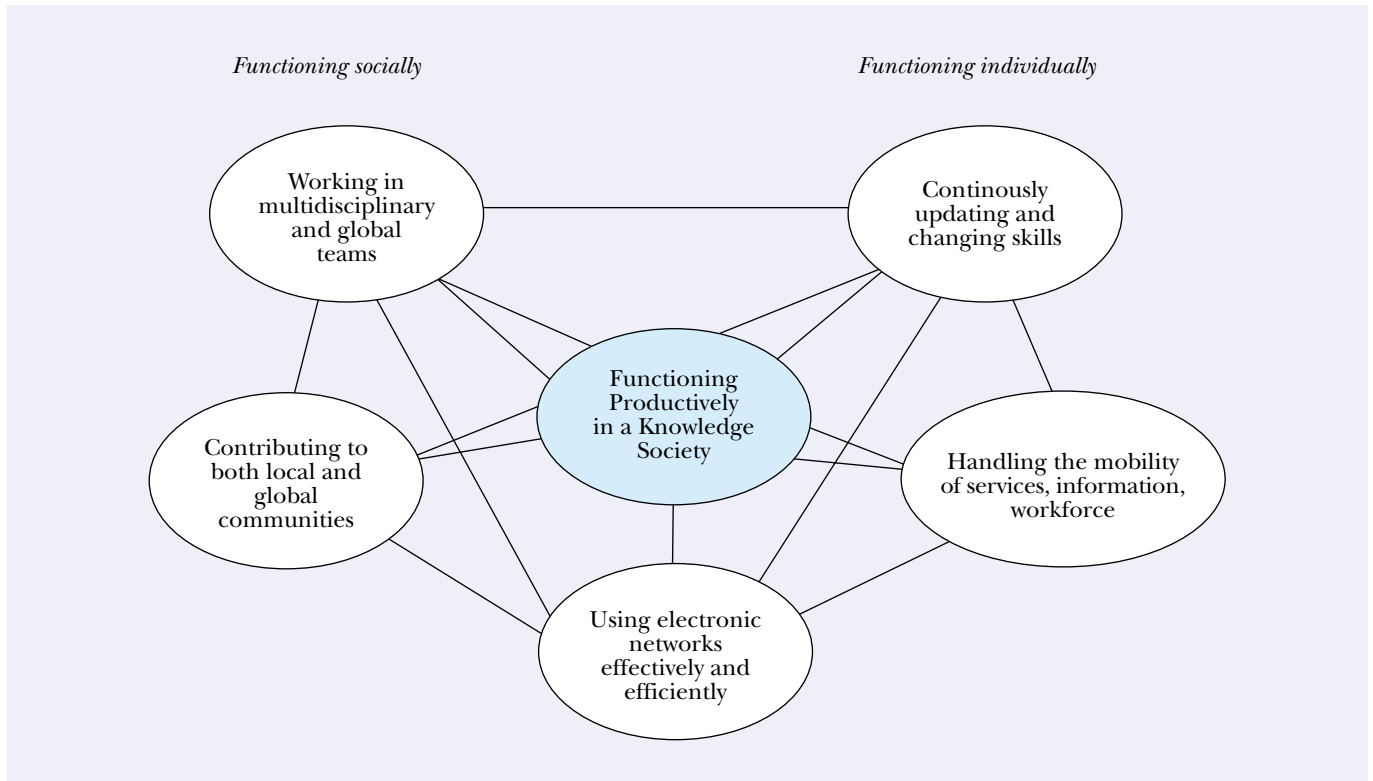
Key words

aprendizaje flexible, flexibilidad logística, flexibilidad pedagógica, tecnología, cambio

BETTY COLLIS. Well, thank you very much for your careful reading of the summary of my CV. If I had realised that my colleague professor Moonen was also here, he could have prepared the same sort of list about his work in the area, because together we have done most of the things which I will be talking about this morning. So I've asked Jef to join me in discussing with you whatever questions you might have, because it's our ideas that I will begin by discussing in a minute.

At the moment the trends of what is happening in general with information technology in higher education, and also in corporate professional learning, are not the same as those we see emerging as a challenge to our use of supporting learning devices.

We can see a change in society, which is already taking place, and has profound implications on how we think about supporting learning devices and how we assess them (slide 1).

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Functioning socially   *Functioning individually*

Working in multidisciplinary and global teams

Continously updating and changing skills

Functioning Productively in a Knowledge Society

Contributing to both local and global communities

Handling the mobility of services, information, workforce

Using electronic networks effectively and efficiently

SLIDE 1.

The picture on slide 2 is a simple view of what we feel are some key emergent aspects of being a productive citizen in the so-called emerging knowledge society. This term is a metaphor. It's used by people in many different ways, but when we look at those who analyse knowledge society and what it implies, we see that the five nodes –ovals, circles– indicated in slide 2 tend to be consistently mentioned. And these are divided into two different branches.
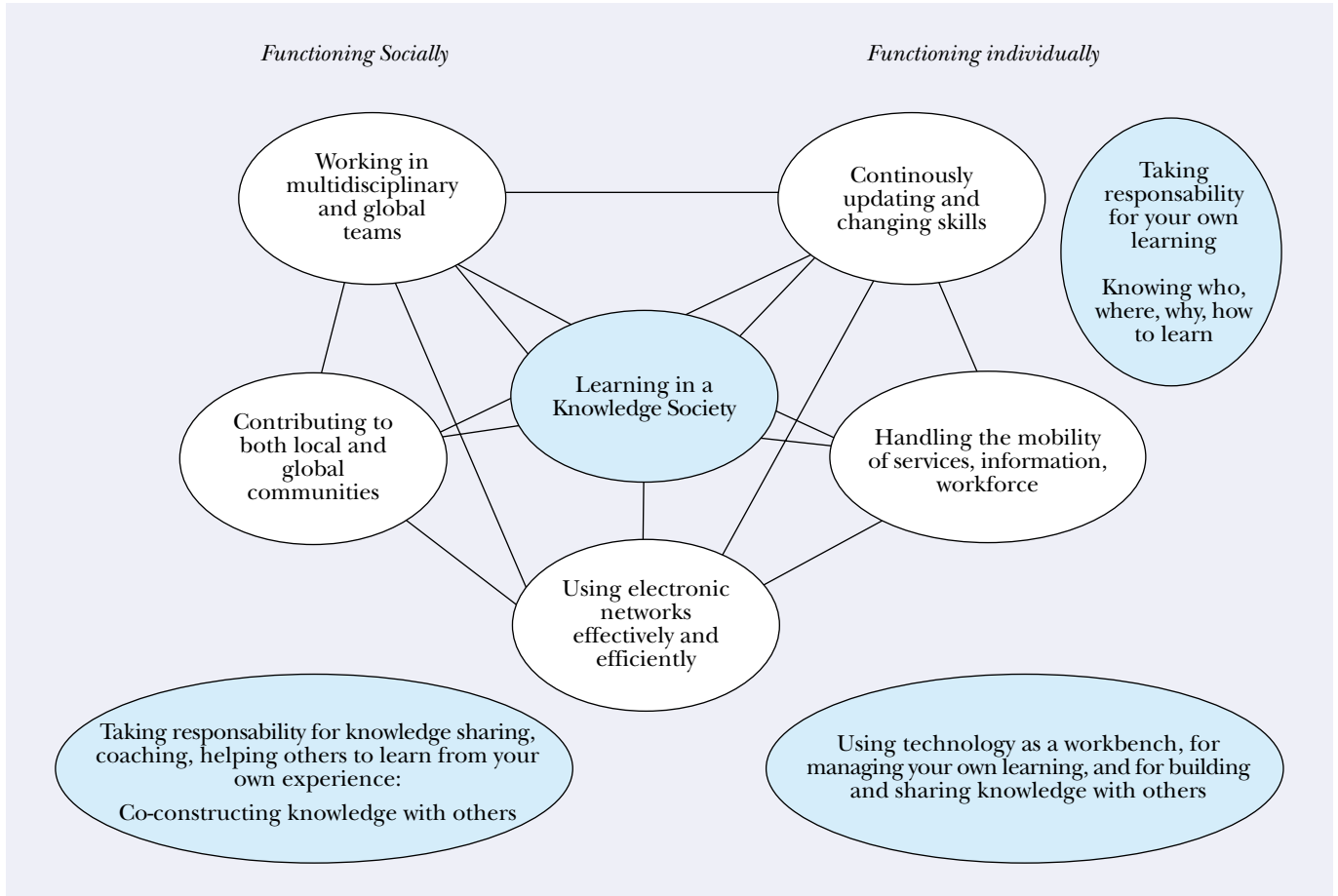
One relates to the functioning of citizens as individuals, where they must be increasingly responsible for themselves in order to find, interpret, direct and deal with changing situations, work changes, changes in working procedures, changes in the interactions acquired for their work.

At the same time we see an equal need for functioning in new ways in a social context, not just with one's neighbours or people who speak one's own language, but also in multiglobal and multidisciplinary interactions.

More and more we need to work comfortably with people we perhaps have never seen before and with whom we perhaps have very few points of shared background. Not only must we work well with these rapidly changing large communities, but we very strongly believe that we also have a responsibility to contribute. As productive citizens we are not just obtaining benefits, but we also feel that it's very important that we contribute to these ongoing knowledge communities that we have become part of.

For all of this to happen, it is inevitable that we must use electronic networks, the Internet, network-based tools, service systems. All professionals already do. But we must constantly learn to be smarter, more effective,

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Functioning Socially   *Functioning individually*

Working in multidisciplinary and global teams

Continously updating and changing skills

Taking responsability for your own learning

Knowing who, where, why, how to learn

Learning in a Knowledge Society

Contributing to both local and global communities

Handling the mobility of services, information, workforce

Using electronic networks effectively and efficiently

Taking responsability for knowledge sharing, coaching, helping others to learn from your own experience:

Co-constructing knowledge with others

Using technology as a workbench, for managing your own learning, and for building and sharing knowledge with others

SLIDE 2.

more efficient, more creative with the way we use our shared tools.

So, with that analysis what we see as an emergent paradigm for learning in this sort of society is represented by three additional ovals or circles in slide 2. Under the aspect of individual functioning, we see that learning should more and more emphasise the need for taking responsibility for one's own learning. Less and less is learning a matter of getting material carefully prepared by an expert and more and more it becomes a matter of knowing whom to ask, where to find relevant experience, how to combine, contrast, extract a message oneself which is useful to one's own situation.

This has serious implications for us as instructional designers, because eventually I believe that our job is not to take great care in presenting the content in a perfect and beautiful way. In fact, we do our learners a disservice if we say that responsibility for learning is theirs and that here you have, this is for you. More and more we have to take the risk as instructional designers to help our learners to become better at doing what we do, at combining, comparing, contrasting, synthesising, ordering, structuring, and taking decisions about information.

That doesn't mean we are going out of business, but both Jef and I say that we see ourselves not as instructional designers anymore but as activity designers, de-

signing the several different sorts of activities –learning activities–, and the way in which the expert, the teacher, the tutor supports those activities to help people to constantly develop that sort of meta-skills.

On the bottom left hand side of slide 2, under the social functioning, we see this dimension of interacting with others. Again, we see the learner not as someone who receives material, but as someone who has a shared responsibility to contribute to the learning community. The idea of learning to co-construct knowledge, products, analysis and mental models, we see as an important way to respond to the needs of the knowledge society.

These are not just general ideas that we have. It's the way we have done our own work at the University of Twente. It's the way we do our work in other contexts such as Shell Learning. It's the way that we and our graduate students have been studying and working around for many years. So we do have ways to move forward, these are not just global ideas.

The critical way to move forward, for us as educational technologists, is represented by the bottom circle on the right of slide 2. Jef and I have just finished writing a little book called *Technology as a Learning Workbench*, with the goal of capturing after all these years, Emma was kind, we both actually started in the 1960s, with computer-assisted learning.

To us the idea of technology as a workbench to manage, create, handle, sort out, combine, share, and do things, is what we feel is the most powerful use of technology to support learning.

These are some very general ideas and the next few figures show some of the ways in which we are stepping forward to try and realise these in practice. Because practice still means that we deal with people in programmes, in courses, that they have to pay tuition, get a degree, get time off work to do a course. We must put boundaries around learning events so that, fulfilling

these, they will still be efficient and manageable for busy working people; they will have a satisfying beginning and end, and will be assessed, because as instructors we have to assess.

We are not just dealing with lifelong learning in the ongoing sense, but also with courses in programmes. At the University we have a master's degree in Technology Applications, which has been taking place now for nine years, and has now been revised to fit the Bologna European Credit Transfer System, that is, many more minutes of study for every credit unit.

At Shell, where I have been working for five years now, in the Shell Learning Centre, the clients are all working people, technical professionals working in Shell's exploration and production sections. So they are graduate engineers; all of them. They work and many of them are PhD's, probably like, I understand, many of your students. They are mature working individuals who still, for various reasons, are expected to take some courses. So these ideas need to be manageable and packageable, and have to be handled by the tutors who don't yet see the world this way. So, at the same time as we work with the tutors and the instructors at the University –to check how they do things- we must try to quietly communicate this reason for doing things.

We have been studying for many years what happens in higher education, and now in corporate education, in response to changes in society, especially regarding technology. Slides 1 and 2 show our opinion about where things are going, but that's not where universities now are. So where are they now and how are they so slowly moving along? And are they heading this direction?

In our research we have identified what we see as two different types of flexibility that higher education and corporate education are now more and more offering to their clients, and these two types of flexibility both need technology, otherwise we can't do it.

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The first type of flexibility relates to what we call logistics while the second type has to do with pedagogy (slide 3). Logistics means how you do things, how you handle things, how you manage things. The goal of logistics, in order for it to become more flexible, is that the processes our students have to go through are efficient and easier, more professional, more organised.

We have a requirement to continually challenge our services because this is what society is like; we expect to go to the money machine, and put the card in and out comes money. We expect the system to work, thus we have to worry about that too. Our clients need to get what they want in an efficient comfortable way. You know this, of course. But this is an important development. You are ahead of many traditional universities in the support you give to logistics and learning. Many of the traditional universities are only now, by bit by bit, introducing ways to use technology in order to offer the sort of services you already offer in your virtual campus.

But soon you will not be unique. Soon every university, every western university, will be offering this sort of services to web-based systems, to integrate enterprise-wide systems.

The diagram below does not represent new approaches to learning, but rather what we call "logistics" improvement (slide 4).

What we see is good progress on what I call the logistics side, and we are gradually widening that, to allow us to have more communication and to ask questions more easily. That's all good, but is not necessarily a new model of learning. It's just a way to do the same things in a more technologically appropriate way, to ask questions whenever one feels like it, to find information whenever one feels like it. It doesn't necessarily mean a new model of learning.

So when we study the first type of flexibility, the big trend is towards more mobility, more interoperability

The first type of flexibility

Logistics of learning:

To make processes more efficient, easier, more professional, better organized, just-in-time, archivable
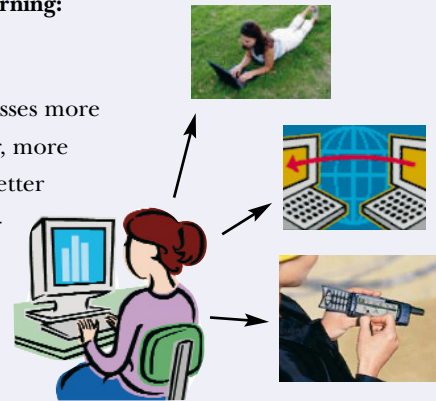
SLIDE 3.

between different teams, more ease to be connected, more ease to do what one wants to do. Lots and lots of developments here are led by technology, but they are very useful for us, of course, they are very important products. Wireless campuses and the offer to clients and students of the easiest possible ways to connect the net, wherever they want is an important part of our service package.

And all these sorts of things are words that go with proving our professionalism, giving people tools to help them do all the things shown on the left (slide 4).

These are more or less becoming normal in virtual campus environments made by universities. It doesn't mean that people use them in a very efficient way, but this is improving. This potential should be there.

What's especially important to me, and to us, are the bottom things on the list, the idea of being able to use technology easily, to share, to work together, to transfer (slide 4). The technology should not constrain anyone in what they want to do. If I want to share something with you, the technology should only help me, it should not present any barriers.

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Logistics of learning
Organizing
Archiving
Finding
Saving
Maintaining agenda
Synchronizing
Communicating
Submitting & returning with feedback
Containing
Trasferring, sharing

With flexibility of time and place

SLIDE 4.

The second type of flexibility

Pedagogics of learning

To extend and enrich how to learn via social learning; new models of learning; new ways of creating, designing, and building learning

SLIDE 5.

In many management courses' systems, the existing virtual campus systems, in fact prevent, present very serious barriers. Learners can only put their submissions in a drop box, and nobody can see them but the instructor. That's a pedagogical model –in my opinion– that doesn't fit the requirements of a knowledge society and the requirement of easily being able to share with and transfer to whoever you want.
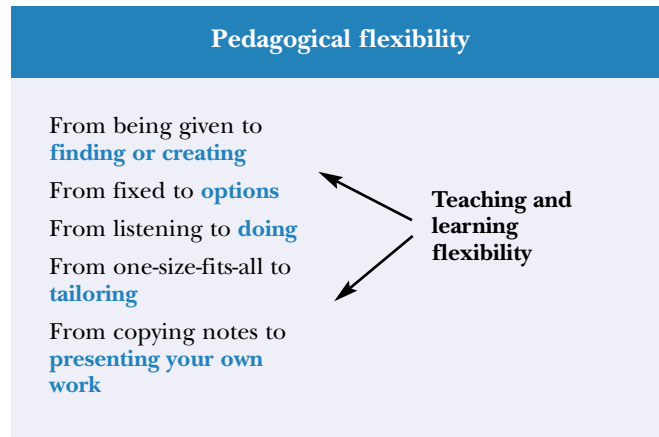
But, let me focus now for the last of these few slides... On the second type of flexibility relating to new ways of learning, because this is where Jef and I spend most of our thought.

These are some of the changes that we've seen that can move us into this second kind of flexibility (slide 5).

The first point I've already mentioned, but it's important because it underlies our way of thinking, it's a way of moving away from using words like "we will deliver a course", "we will give a course" towards "we will help the learners find and create things themselves".

Moving away from saying, "Here is the course and here is what you have to do," to saying, "What working op-tions would you like to have for learning in this course? What sort of activity? Here's three or four options, which one would be best for you?" Instead of talking, handing in and reading, which will always be there, the emphasis is put on what they are going to be doing.

This idea of being easily able to adapt, or tailor, what happens in the course, with the learner having more and more control over the tailoring, and yet keeping the whole thing manageable, is what we find exciting but challenging. I'm never interested in my students telling me what I have said. I already know what I have said. I want to learn from them, I want to hear how they interpret what I say and make sense of it in their own words, and what it means when they try to translate it to their own context. I never want to have them tell me what I said; I want to be surprised by what they tell me, because when we are running an event together we are a learning community and that is important from our point of view.

And this simple picture it really underscores where Jef and I have been moving towards since those early days thirty years ago (slide 6). We have never been interested in using a computer to deliver content. I know there is a place for that –libraries are wonderful. I am just saying in our own work that is never been our interest. Our in-

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Pedagogical flexibility

From being given to **finding or creating**

From fixed to **options**

From listening to **doing**

From one-size-fits-all to **tailoring**

From copying notes to **presenting your own work**

Teaching and learning flexibility

SLIDE 6.

terest has, more and more, moved towards this idea of how we can shape the learning events so that our students can co-create, at least, some aspects, of them.
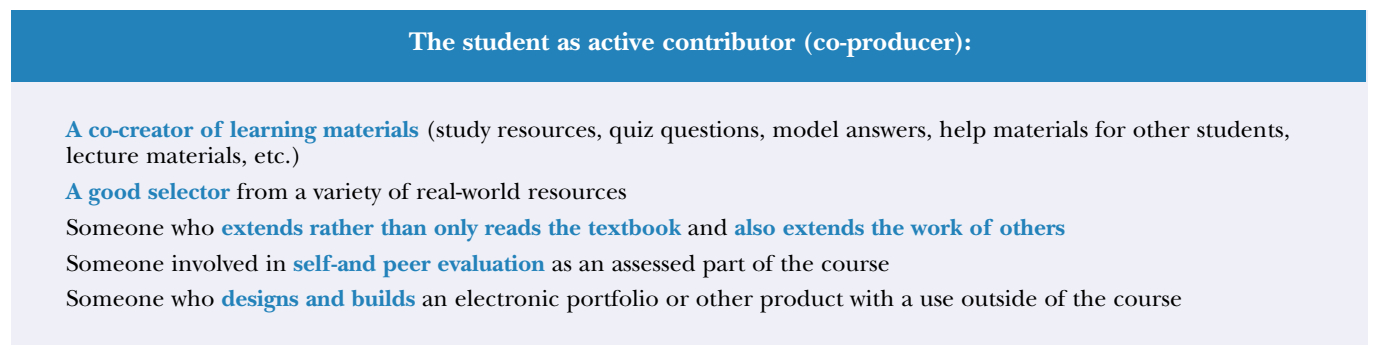
This I think is the last slide: it's just a few of the examples of how we work this out in terms of the assessed activities in a course (slide 7). The important idea is that what the participants create, find, and think about is not just submitted to us, but it is specifically submitted as a building block for the next step of the learning. This is one step more complicated than just having a discussion. Discussion is good, but we see a step forward beyond that, where one creates something with the explicit idea of helping others to learn. That is not just expressing ones own ideas about something, but that is going a step forward towards helping others to learn.

At Shell, for five years now, we have been involved in this idea. We don't call it the contributing student at Shell because they don't call themselves students, we call it knowledge sharing. We emphasize the knowledge sharing aspects. A typical assignment now in the Shell context, -which is totally at a distance, by the way, as people stay at their oil rigs, in the desert, wherever they are- is looking at the topics of the course, choosing one in which they have the most expertise, where they feel they can best contribute to others, looking at the prepared study materials for that topic and adding something to them as a supplement or example. And that would be part of the study materials for everyone else. Therefore students choose something in those study materials that they can extend.

DEBATE

QUESTION. Shell is pretty unique, actually it's doing a great job, it's very famous in the learning world, well the company all together. But we see a lot of cases where the companies are not really looking for knowledge. Most of the time they tell you: "Just tell them what to do." And so the negotiation is always, like, "No, no, no, that's not what I really want in the long-terms, that is not your problem now. That's not really helping." And they say, "Okay, but I'm paying you." As if, because they are the client, like: "I'm the client, and I'm asking for a solution now. Just give me the info, and you tell me what to do."

So this motivation for wisdom, for knowledge, or motivation just to give me the answer now: short-term, long-

The student as active contributor (co-producer):

A co-creator of learning materials (study resources, quiz questions, model answers, help materials for other students, lecture materials, etc.)

A good selector from a variety of real-world resources

Someone who **extends rather than only reads the textbook** and **also extends the work of others**

Someone involved in **self-and peer evaluation** as an assessed part of the course

Someone who **designs and builds** an electronic portfolio or other product with a use outside of the course

SLIDE 7.

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term. And that is the same negotiation, I guess it's like the knowledge society, we are moving towards there, but everybody is not really there. So this transition in the corporations, wisdom, solution now, knowledge society, we are moving towards that programme of contribution. But now, in the meantime, how do we solve this negotiation? How do you work with Shell? How do you work with your students and say, "Okay, it's not faster, but it's better, it's good investment." What is your experience?

BETTY COLLIS. That is an excellent question, I will give one simple answer and then I would like to ask Prof. Moonen to answer further. Professor Moonen has just been working on a project which has looked at this question, what to do with twelve or fifteen different cases within an "e-learning awareness" framework to help get a more informed response out of the consulting session.

But my own response is to look for the real problem. Often, as you say, the problem is perceived as short-term one: "We have to learn this now." Okay. But at the same time, I try to find a way of linking this short-term problem to a more strategic one. So, for example, a little while ago, somebody wanted to have an e-module that would train thousands of people to do a certain process very quickly. I answered, "Yes, we can do that, but at the same time wouldn't it be also very helpful to build on the problems that clients are indicating that they have with this process? We could build learning resources that help to identify the problems that are actually happening in the field with clients". The client responded, "Oh, yes, yes! We do have a collection of the clients' problems, we have a helpdesk." I responded, "Good. I bet if we could look at the sort of problems the helpdesk deals with, we could save time on making this e-module. Maybe we could just take the questions that come in from the helpdesk and have a quick start for a module. We could set it up tomorrow, with the helpdesk's question collection. This way we can use the helpdesk people as the main informants as to what problems people are actually having."

So, I look for strategies like that to, in fact, do the "quick job" even quicker, by bringing in real experiences from the business. And from that, then, the next step is to get someone in the training department to help the helpdesk staff. The designer looks at the questions the busy helpdesk person is handling and chooses one set of them and designs a job aid for him that will help him be more efficient in answering those questions.

So it's that sort of strategic thinking that we use with clients, and at the same time I say, "With this approach we'll get this course going much faster. I won't design a course for you. I'll start tomorrow with the questions that the helpdesk has." And based on the questions, we'll see that maybe there are two or three key points that clearly are confusing people. Then we can design a special mini-lesson about those key points. But maybe nobody asks questions about other functionalities, so we don't need to spend time on them. So usually, with this approach, we can show that it will save time in terms of the short-term response, but also we can help the client get started with this different way of thinking. But you have to be quick at taking advantage of that window of opportunity, that moment to stablish a link that will satisfy the client's short term needs.

JEF MOONEN. I have been working with an experienced consultant, who has also just finished his PhD, on the approach he uses with clients. What he did was to develop a kind of strategy, an approach, to steer how we start talking to a company and tested it with different companies and different levels of people. He has three phases of strategy in this approach, and in his first phase his main point was to talk with the clients and try to get out of the clients what they thought e-learning was in relation to the solution that they were looking for. So whatever way they were qualifying e-learning it was fine as a starting point.

His method involves a kind of structured dialogue, and it went very well for him, an important thing in his case

because it was the focus of his dissertation! His idea was that his approach would be generic. He is a very bright guy, he is able to talk to the companies and to the people and understand what they are saying and react immediately. He has this scheme in his head, so instead of a general line evolving towards what he wants to do, he can react quite fast to what others are saying. But he also tried to train master's degree students to use his approach though this was not so successful. The interaction between the client and the consultant involves picking up quickly what the companies really want, implicitly, and maybe unconsciously even, and the students couldn't pick up as these insights. Only he, with his knowledge and his experience, could pick up on what the companies wanted to do.

And so to demonstrate that the method works, when you ask him, "What is the success of your approach?", he says, "When I get a new contract from a company." So it's a very flexible approach in a way.

As another example, we were teaching a course for the corporate sector, maybe ten years ago, or even longer. We started to do it very carefully in terms of task analysis. Their question was, "What kinds of hardware and software do we actually need for instructional purposes?". So what they would have liked to do was to build a corporate-oriented course, with all kinds of specific answers to their questions. They were very dissatisfied, because their request was, "Give me the answer now." And we had to say, "There is no one answer".

So I think the way to deal with your client's question is, when the question is very technical and there is a simple answer, of course you give it. Now, in most cases, of course, if you are going to change your behaviour, then you will be getting into difficulties if you let them think there is a simple answer.

What companies are interested in is the return of the investment that they do in a large institution for using technology, that is the bottom line. When you look at their calculations in the traditional sense, in most cases they are not very useful because they are too obvious. Or they have to deal with too much detail. But if you want the real answer, the traditional one doesn't help you.

So what we have done is to develop a Web-based instrument to simplify thinking about return on investment. In a way it's a kind of attitude scale, with different groups of questions. What we try to do is to make people fill in the scales with main issues that are the most important of certain uses of technology. This is to make them think, to make them aware of the intangibles that are always there and that make it difficult to come to a solution for their problem. And then it's up to them to deal with the weighted positives and negatives of their problem because it will be a long-term situation. If they don't want to understand what their real problem is, in terms of change, what can you do?

By the way, let me make a remark on what I've been hearing today. Did you notice that, when Betty talked, she never talked about "e-learning"?

BETTY COLLIS. Yes, that's not a word that I use.

JEF MOONEN. In the book we have written, it's always "flexible learning", not "e-learning". Because many of the problems with e-learning relate to the fact that each of us, I think, has a different opinion about what e-learning is. It's an open door. I know it from the past, when we talked about computer-based learning, CAI and CBL and all those things, very often people had very strong discussions and it was because they had a different opinion about the meaning of the term they were talking about. And the same is true with e-learning. So I think that one thing that has to be done is to forget the term e-learning. But I don't think we can, you know, because it's in the air, so we can't avoid it.

But it's really important for yourself, and for your target audience that you explain, in one way or another, what

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you mean by "e-learning". As far as I'm concerned, as Betty was saying, all the forms of teaching in which we use computers and networks to support learning can be called e-learning, that's fine, okay. But then, you will be talking about something you have defined, and not about e-learning as a label. This is an important issue.

MODERATOR. Thank you very much. Okay. Any more questions?

QUESTION. For me your oral presentation was interesting, because I think we work in the same branch. For me it is very important that the students learn together and work together. And with that I mean doing research about collaborative learning, collaborative working in a virtual environment. My question is: because you have a lot of experience, what is your experience with what students learn to improve in collaboration and their relation with flexible learning? Because sometimes there are two aspects very difficult to learn, or to work with and to learn in collaboration, and to respect the flexibility of learning.

I don't know what your experience is or what experience you have in situations where students know that they need to work together but they don't usually like working together because they think they can't work flexibly and it's very difficult in our case to work in a synchronised way. And afterwards, usually, when they finish their work, they are very happy because they learn more and they learn with critical thinking and so on. I don't know if this is your experience.

BETTY COLLIS. Those are good questions. Two reactions: if you noticed from the way I've described the contribution approach, it wasn't necessarily a collaborative learning approach. People can do it individually and in their own time, and in their own way. They contribute, and they learn from the submissions of others, but this may be done in an entirely individual way. That is also an important strategy to fit into the flexibility of learning events, because you're quite right, it's very

hard to organise real collaborative work when people are at a distance, and are working people. The more you tailor activities to a person's own working situation, the harder it is to really ask people to collaborate together unless they come from the same working situation.

So our contribution model is an asynchronous approach to a learning community, which doesn't necessarily involve the dynamics of collaborating. So that's one answer for your questions.

In terms of offering options, what we often do at the university is to offer students the choice of different ways of participating in the course. They can work together on something or there can be a variation of the assignment that they do by themselves. In either case they contribute something that they find or create, and then they use these contributions to learn from each other. But we find that by offering the choice, people choose what fits their preferences and their work relationships. When Jef and I studied this with another PhD candidate several years ago, we followed very carefully in a number of our courses what happened when we offered students the choice: they could either work as a group with face-to-face sessions or they could just submit their assignments when they wanted to.

We found that it was about half and half, about half the students chose the approach of having contact and interactions, and the other half working in a way that they could fit around their own busy times.

What we found at the end of the courses, with a standard test at the end, was that there was no difference between how well these two sets of students did. When we compared the products they created or the essays they had to write or the analysis they had to do or something, there was no difference in quality. And when we asked for their satisfaction level with the course, they were all satisfied. So to us that was an important lesson in terms of offering options. When we are dealing with profes-

sional adults –I'm not talking about children now, my work has always been done with adults, with professional adults–, give them a choice, some people really prefer to be able to do things in their own way, in their own time. Even so, we always try to have them learn from each other. That is the contribution aspect, that can be done collaboratively or not.

Now on some courses you might really want to insist on collaboration if it's part of the content itself. But then you lose a lot in flexibility and you will make it hard for some people to participate. But that's so even if they are on campus, we offer this choice to all of our students, we don't make a distinction of whether they are on campus or not. They sometimes are on campus, and sometimes not. We don't care where they are. We offer them the choice. But then you need to have two different types of equal assignments, with the same weight. So that nobody can say "it's not fair, I had to work harder", we have to plan different sorts of equally weighted options.

So that's my answer, although I like collaboration very much, it's hard to try to force it on people.

JEF MOONEN. It's nice to have all these wonderful ideas like collaboration but of course the students have to fit them into a practical scheme, they have to deal with courses and with many other things to do. And you as the instructor have to deal with the number of students that you have. So as soon as you have many, many students, and you do things such as collaboration, it's very time consuming because in one way or another you have to be involved. And so what we noticed at university level was that as soon as the class becomes large –I'm talking about fifty or more students– and you have individual assignments within a tight timeframe getting the students to work in groups is sometimes a way to reduce your own time load in terms of marking.

It's a practical thing. I remember, starting with computer-based learning a long time ago, I was enthusiastic and

optimistic. My God! Then I found out that I couldn't handle it; it was too much. So I learned the hard way how to come to what I thought was a balance. A balance, this is very important for me. It depends on myself, and on the course, and on the students. It's a very complex interdependence. But I learned the hard way to find a balance between what I had as an ideal and what I could handle practically. When students send me a note what the students really want is an answer. They want feedback, right away. It's utterly important. And that may mean opening their work and saying, "I got it" or "Nice", maybe not much more, but it doesn't have to be a long story. Students want fast feedback, that's how they feel that they are doing their job and they want a response to that. That's very important. Now if you have lots of students, you just can't do it.

So from a technical point of view you have to find the balance between your ideal and your practicalities, and so in that respect I can imagine that you more or less force students to collaborate, because then you can say to students, "I want your assignments, joint debates," and you can use all kinds of, what I call, tricks to make sure that everybody does their part. So that's an important issue: the ideal and the practicalities.

BETTY COLLIS. An example of this is a graduate course that I was teaching. The overall task in the course was for all of us together to make a web-based resource. So everybody had to contribute something to this web-based resource for a real target audience. I put them in groups of three –as Jef was describing–, and each group had to do a part of the web-based resource. And within each group I asked them to take different roles, so that one was responsible for the content, and one was responsible for the presentation of the web material, the layouts and so on.

Anyway, with this sort of approach, the instructions were clear about what everybody had to do, so in fact they all were collaborating to make this one product, but they didn't have to actually be dependent on each other;

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they each had their piece to do within the puzzle. So they were collaboratively making a resource which we presented to the client at the end of the course, but they didn't have to actually work with each other in terms of tasks. If they chose, they could, in their group, talk to each other asynchronously or even face-to-face, if they had a way, of course. That was fine. But if they didn't want to do that, they could still do their piece of the puzzle with a limited need to schedule interaction with each other. But they were still collaborating, all of them together, on this product, because it was an entity that had to be presented, and if somebody's piece was poor, or missing, the overall product suffered from it.

So that sort of strategy is an example of what Jef was saying: we looked for ways to still get the benefits of working together but allowing people flexibility in how they actually did it.

We have done this many times, this sort of final project for a course, where together the whole group makes something, and so there is a kind of structure. What we did in that case, was that we made a common structure for the overall web resource. There was a frame structure with certain fixed categories. And the navigation structure was clear to students, so that each of them had one of the branches of the tree to do, so that their work had to fit into this common structure. They had to be able to zip their files up, upload them on the TeleTop and then their pieces had to fit together. They had to use the same file-naming convention and so forth, so that their pages would fit into the overall Web site.

We have done this many, many times as a way of dealing with the strategy of allowing flexibility as well as a common task. Some groups of three got together and physically talked, did everything together, helped each other… Other groups of three never saw each other at all, and they just did their part of the task, and said, "Okay, I'll do this, and you do that." It was a way to make it work for them and for us. Then we only had to deal with six groups instead of eighteen individual students.

In this case, I met asynchronously on the telephone or face-to-face, depending on where each person was, with a representative of each group three times, I think. Sometimes via a telephone conference, sometimes with some of them sitting in my office and others on the phone. And I used those moments as moments to have the groups give each other feedback, as all the work in progress was being carried out in the shared workspace in the TeleTop environment. They had to check other groups' work for consistency, because we wanted to produce a final product where each group's part had a separate topic, and therefore a separate feeling to it, but the user of the overall product had to feel that it was a common product. So you couldn't change your navigation scheme within one of the parts, for example, as that would suddenly confuse the user. The user had to keep the frame's structure as a common environment.

Anyway, things like this are strategies that we have developed over the years to combine the benefits of working collaboratively with the management needs of letting people be somewhere else or physically together.

MODERATOR. I think we have one more question. Two more...

QUESTION. Do you see this as a business or a personal project? And does it mean the personalisation of the learning process through learning objects? Now we are including response specifications in our budgets, but sometimes with that, we have to bear in mind the research that Dr. Koper, in the Netherlands is doing in the Open University of the Netherlands, in terms of learning design specifications.

So we are not sure if this is a better path to follow because we know that there are more pedagogical specifications coming, so sometimes our professor says, "Okay, it's called (…) it's good, but these are limited specification, because we need to contextualise more than (…)." I'm sure that the contribution of learners is really important in building this kind of context, so I would like to discuss a little bit more this topic.

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BETTY COLLIS. We just finished a PhD on this topic. And right now I'm writing a chapter with this person on the topic, so I am thinking about this.

To give a simple answer, because time doesn't let us talk further, we think that there are probably two different contexts or cultures for learning. And most of what I've said today reflects one of these cultures, we call it a personally oriented culture. The reuse of learning objects is important in this culture in the way I was mentioning, but the pedagogy isn't built into the learning object. Pedagogy comes from the activities that we have been thinking of, and they are not in the learning object. The learning object is what people make after going through a process; or can be a resource that helps them when they are making or doing something.

So for this line of learning philosophy I'm not interested in the EMS, the Rob Koper approach, because it's an approach that builds the pedagogy into learning objects. That's an acquired view of learning that says, "If you make the pieces just right I can pick up this piece, and this piece, and this other piece and they fit together." Well, there is a place for this kind of learning, but then the whole culture has to fit that approach, the whole view of what you want from a learning experience and what people are willing to respond to.

Jef and I have seen attempts for over thirty years at making learning objects, with a different terminology, but with the idea that the computer and the designer can figure it all out. I'm not saying it's impossible, I'm sure there are moments when it can happen, but in most of the learning society applications that I'm thinking of, you don't want the computer to deliver learning. The learning process comes from the person taking hard decisions with messy options. So, I think if you want to be successful with the use of learning objects, with the pedagogy authored by the designer or instructor, which is the EMS assumption, then you are moving in a different direction from the one I've been talking about today. It's not wrong, it's just different; it's more an extra direction which assumes that the expert or the computer take the decisions about what the learner gets, and then the learner does it.

I'm sure that I'm sounding oversimplified when, as I was saying, it is a complicated topic. But in general, my feeling is that the idea of making content learning objects to incorporate them in an EMS-type system, where you build the programming that links them together, is what many have been trying to do with computer-based instructions for thirty years. This has been a long process, it's never really succeeded. I think it's never really succeeded because the underlying basis that learning is something that we as experts can predict in advance and deliver via a computer never really satisfies people.

JEF MOONEN. Often those interested in learning options assume that there is an underlying learning theory that is applicable to everything. There is not. So I think it is a hopeless road.

BETTY COLLIS. What I find very interesting is what is being done in Australia about learning objects based on learning design. There is a repository of reusable learning objects that has emerged out of that research from Australian universities, based on seven or eight key types of learning activities –case study, problem solving–, and then they have developed templates that structure what you need to think about in order to use the activity template in your own website, for example for a problem solving activity. What do you need? The template helps you to give the needed background information, state the objective, set up the web folder for different groups, decide how many groups you will have, and what will be their roles. From the research, there is a template available for each of these types of learning activity designs, and a repository available to instructors in Australia, in universities, to submit examples of how they filled in the templates for their own specific courses. For example, if I use the template for problem-solving in my course, I fill it in with the specific thinking for my course and then I can contribute that to repository and then anoth-

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er instructor looks at this, not to use it in exactly the same way, but to get an idea for his own course. He would say, "Oh, that's kind of interesting. I could use this, but I have to change this, and I have to change this, and I've got to add my own…" So the template and activity design are meant to be tailored. I think there is more potential in this sort of reusable learning object than in content objects that have a built-in pedagogy.

That's my own opinion.

QUESTION. I wonder which type of paradigm the students were using when they valued your work.

BETTY COLLIS. The approach I was talking about today.

This approach has always been our paradigm. We don't have many face-to-face sessions. The courses that we run are hard-work courses, but we don't do many of face-to-face sessions, in fact very few. Sometimes I never see the students at all, and I see some of them maybe once or twice. But nobody ever says that they are not having a lot of interaction, because we are very busy with all the steps and the submissions that we are doing as our contributions… I think of it as a teaching that comes from what they submit. I see the submissions coming in and I see ideas emerging, and sometimes the teaching is just for maybe one or two students. I'll just say in an email to them, "You know what I thought when I saw what you did? I wonder if…" But other times I'll use a teaching to approach a whole group, and then I'll post a reflection to everybody.

However, if we do have a face-to-face session we always make them optional, so the students don't have to be there. We use those sessions mainly to expand on these teachings. "I have seen from what you are submitting that a number of you think that the most interesting part of this design project is in fact to make a choice about how... So, let's talk about that some more," So I build the course around what they do, and I think people seem to like that.

But that requires –as Jef said– real management skill. I also have to be inflexible sometimes, so I say, "Yes, you can hand it in whenever you want, up to Friday", "I will promise you that on Saturday or Sunday I will give you my feedback, but then I have to do something else next week. So if you want to hand it in later, then I won't be able to talk to you, because I have to plan my time too." So that's also what I say: if you choose to take your time, fine, but then I can't promise to be available, to be really immersed in your contribution. I will mark it, and I will make model answers available so you can see what the others have done, but I plan my time very carefully, so when the course is going on I commit to my students and give them feedback every Friday, and wherever I am, in whatever airport, I do it. But I can't do that all the time, I have to end the course. Mentally, I have to put a boundary on the course, so after a specific Friday, that's it". Then you are on your own, I will mark your assignment when you do submit it, of course, but the dynamics won't be there like they were during the scheduled course time."

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