

A New eLearning Approach from Course Management to Active Learning

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Abstract

In this paper we identify that just-in-time learners, who are in fact highly motivated students, are eager to find and gather free knowledge from the Internet, making the traditional way of Lifelong Learning (buying books and readers) obsolete. Consequently a switch has to be made in the focus of knowledge institutes that focus on lifelong learning. The focus will eventually have to shift from providing books and readers, to creating and managing free knowledge of guaranteed quality, accompanied by guiding students and assessing knowledge at a constant high level.

We illustrate our approach with parts of our course ‘Human Information Processing’ at the Dutch Open University (Open Universiteit Nederland)¹.

Introduction

In traditional directed-teaching methods, the lecturer controls the learning environment, the books, and other resources to be used as well as the way in which students should learn. This ‘didactic instruction’ paradigm is still dominant in education (Soloway et al., 1996). However, this method does not always have the expected results, mainly because students ‘*often seek the most expedient and least demanding approaches to learning that enable them to pursue their social objectives more thoroughly*’ (Jonassen & Land, 2000).

Several Course Management Systems (CMS) exist to assist lecturers, without changing the paradigm, nor using new technology to its full potential. In this paper we make a clear distinction between the terms Course Management System and Learning Management System, as proposed by Watson & Watson (2007) in their ‘argument for clarity’.

The Dutch Open University mainly attracts lifelong learners, students who do courses next to their daily job. This means that sturdy planning and traditional directed-teaching is rarely feasible. Different from the students described by Jonassen & Land (2000), Dutch Open University students are mostly highly motivated, active learners, but with limited time to spend. These students will profit from a learner centered approach, as advocated by Soloway et al. (1996): ‘*The central claim of learner-centered design is that software can embody learning supports – scaffolding – that can address the learner’s*

¹ <http://www.ou.nl>

growth, diversity and motivation'. Coming from different backgrounds, all our students have different entry-level knowledge, different learning targets, as well as different personal time schedules. We find that learning environments in general, but lifelong learning environments specifically should scaffold learning, taking into account the growth, diversity and motivation of each learner.

We use Woolfolk's (2004) definition of scaffolding: '*Support for learning and problem solving. The support could be clues, reminders, encouragement, breaking the problem into steps, providing an example, or anything else that allows the student to grow in independence as a learner.*' We suggest that educational tools – especially in distance learning – should be designed and developed with the 'student as independent learner' in mind, and not with the 'lecturer as didactic instructor' in mind. Existing and new technologies enable such a learner-centered approach, but are seldom used for more than just 'course management'.

The OpenER² (Open Educational Resources) project of the Dutch Open University is an initiative to provide free (open) knowledge. Having a lot of experience in the field of distance learning, e-learning, and correspondence courses (all at academic level) the Dutch Open University embraces the lifelong learning movement. In this paper, we discuss the current use of communication technology in education in general and we describe our approach of learner-centered education by describing our design rationale for the OpenER course *Human Information Processing*³ using five dimensions: psychological, pedagogical, technological, cultural, and pragmatic (Hannafin & Land, 1997).

Communication technology and education

Existing and newly emerging communication technologies enable exciting new opportunities for distance education. These technologies are being evaluated and embraced by distance learning educational and knowledge institutes, but too often '*without dealing with the underlying issues of learner characteristics and needs, the influence of media upon the instructional process, equity of access to interactive delivery systems, and the new roles of teacher, site facilitator, and student in the distance learning process*' (Sherry, 1996).

Though these new and upcoming technologies currently have a major role in Course Management Systems and in true Learning Management Systems, they are rarely used to their full potential. And only in the case of Learning Management Systems (LMS) there can be spoken of learner centered tools.

Current use of technology

The use of communication technology in education is often limited to Course Management Systems or eLearning Environments (e.g. Moodle, TeleTop, WebCT, Blackboard, Dokeos). Many of these provide tools for the lecturer to organize information about the course (e.g. schedule, readers, comments, grades) and to share this information with students in a practical way. In exactly the same way, they provide tools

² <http://www.opener.ou.nl>

³ <http://www.opener2.ou.nl/opener/hip/>

for the student to get information from, and pass information to the lecturer and – in some cases – to other students. Generally, they do not change the learning experience or course but simply aid in parts of the communication, what in fact is one of the most powerful features. *‘The ease with which users can organize asynchronous and synchronous communication activities in CMSs is one of its most powerful features, because it enables (...) instructors to create and support dynamic learning communities consistent with a social constructivist perspective’* (Ioannou & Hannafin, 2008).

There are some learning environments (e.g. Adobe Connect) that are created around this ‘enabling communication’ and are set up like collaborative work environments.

Integrated audio and video conferencing, shared use of a whiteboard, and the ability to record and replay course sessions make these tools more learner-centered than Course Management Systems. The organization of a course with real-time contact between lecturer and students seems to improve student engagement, and to reduce drop-outs. Yet the lecturer is still in charge. Apart from not being learner-centered, many Course Management Systems have been found to have usability issues for both lecturers and students (Jafari et al., 2006).

Watson & Watson (2007) point out that only a few systems can be considered Learning Management Systems and these *‘are more typically utilized in corporate settings’*, *‘have yet to reach their full potential’*, and *‘are important for the Information Age paradigm of education’*. We consider LMSs as starting point for learner-centered education.

Proposed use of technology

Existing and emerging technology makes learner-centered education methods possible and feasible, enabling *learning while doing* (Hsi & Soloway, 1998). Ted Nelson already had education in mind when introducing the term hypertext (Nelson, 1965 p. 96), focusing on the *explorative character of learning* which can be easily supported with hypertext. Certain factors of learning have already been covered by existing LMSs and CMSs, but we find that the interactive abilities of Internet are barely being used.

People who have finished or dropped out of traditional school education will, in our modern society, structurally be confronted with the need to learn. Inevitably the relevant knowledge in the domain of their trade or expertise will need to be refreshed, updated, or revised because ‘old’ knowledge is incomplete or no longer valid, or because their domain of work or their context in society shifts or moves forward. One might say experienced workers or inhabitants of a context develop wisdom and skills, but at the same time they will find out newcomers show new knowledge and experience with more state of the art knowledge sources and new technologies. Consequently people, over the years, develop a need for continuing access to the latest news in their field. Access as such allows them to keep aware of relevant new facts, insights, ways of life, and technology available. Moreover, it would certainly help if access would be accompanied with easy ways to assess the validity of their current knowledge state. Especially those who are in the heat of their career or their participation in society and citizenship, however, have no possibilities or inclinations to stop their daily activities in order to re-enter school. The good news for these people, who in number are in fact an impressively large part of our society, have increasingly access to modern information technology and to the Internet.

The interactive possibilities of the Internet allow a new learner-centered paradigm, in the sense that it is about enabling students to *explore* and *experience* the course content independently through interactive examples and ‘virtual labs’. We exemplify this with our OpenER course Human Information Processing (HIP) later in this paper.

Free Knowledge

As stated in the introduction, knowledge is not far to be found nowadays. If motivated, a student will eventually find and construct knowledge from resources on the Internet. The use of books and readers is losing relevance, especially in our field (Human Computer Interaction), as there is continuous development in research. Books and readers quickly fall behind the state of the art. This is an eminent drawback books have compared to the Internet. We expect this to be the case in many sciences, not only in Computer Science. Unfortunately, ‘knowledge gathering’ from various resources on the Internet has drawbacks as well. A free knowledge base such as Wikipedia can easily get ‘infected’ with incorrect information (even royalties⁴ tend to ‘pimp their profile’ on Wikipedia). Detection of such incorrect information may take a while, or even go unnoticed. Another problem is the lack of context and structure. There are relations between subjects, but the ‘bigger picture’ that a regular course would offer is often missing. We identify a need for well organized and carefully selected knowledge that is monitored and administrated by knowledge institutes and authorized organizations.

Challenge

In our opinion, educational (and knowledge) institutes should take this as a challenge to create and offer free context-related knowledge (e.g. in the form of free courses), guaranteeing quality and regular updates. This approach might need a new business model, in which students do not pay for the knowledge, but for the services available around that knowledge. These services might include feedback from the lecturer, background information, interactive examples, practical assignments with expert review, the possibility to do self-assessment, assessment for credit points (such as in the European Credit Transfer System⁵, better known as ECTS), and many more.

The issue of assessment, in particular, needs careful analysis in order to allow the development of a feasible approach.

Consumers and potential consumers of free knowledge will ask several questions:

- What kind of new knowledge is available that I do need in my current context?
- Did I indeed understand the new knowledge, or, what part of the knowledge do I still have to / want to / elaborate?
- Does my knowledge fit current criteria for my job, for a certificate I want to acquire?

Free knowledge sources can be adapted to support their readers or students to ask and get answered precisely these types of questions, even though in many cases the extra support needed from human (domain) experts might have a price tag attached (e.g., free reading

⁴ <http://bits.blogs.nytimes.com/2007/08/30/wikipedia-editing-proves-a-royal-embarrassment/>

⁵ http://ec.europa.eu/education/programmes/socrates/ects/index_en.html

of the content, payment for an official certified examination). In many cases, however, a simple score on a test could provide enough self assessment, or a comparison of somebody's own generated answer to a sample of answers that are considered standard quality.

As the students we aim at will often develop their need for learning ad hoc, triggered by their current context, so does their need for assessment. Moreover, like the actual focus of this learning is often defined by the context, so is the scope of assessment needed.

It might well be that the need for a (paid for) official exam for this type of students is an exception rather than the rule. Even then, it is clear that no educational institute of any quality will be able to provide human-assisted assessment for free, so a business model for this type of just-in-time assessment needs to be developed and this will only work if the added value is considered appropriate in relation to the price.

OpenER Course Human Information Processing

We developed a new online course on the subject of Human Information Processing for the OpenER project at the Dutch Open University. The course was constructed around our vision of free knowledge. That means that it is structured around a subject (the field of Human Information Processing) and that the course is placed in a specific context (the applicability of the knowledge in Human Computer Interaction). We provide the context, practical examples, learn-by-doing interactive elements, and learn-by-playing interactive elements. The student can not only 'learn by reading', but can actually experience several concepts. Using links to media related to the subject, and to articles that are more in-depth or provide more context than the course does, we appeal to the student's explorative nature.

The course is not very extended; OpenER courses are generally limited to an estimated 25 hours of study-time. This course differs from traditional learning environments as well as from other OpenER courses, in that we base our design decisions on the five 'foundations' specified by Hannafin & Land (1997): psychological, pedagogical, technological, cultural and pragmatic.

Psychological

Every learning environment has underlying assumptions how knowledge is acquired and used. Our approach as well as our course is based on cognitive psychology. We not only provide course material, but also the means to try and experience the concepts we introduce. The course does not treat the content in-depth, but enables students who are interested to explore articles that are more in-depth or that provide additional information or context. By exemplifying concepts and positioning these in an appropriate context, we expect to prevent 'inert' knowledge.

Pedagogical

The learner is in control in our course. Though we provide the possibilities to explore and experience new concepts, there is no obligation to do so. In this way, we try to support different learning styles.

Our course *'establishes contexts that promote sampling, discovering, manipulating, and investigating'*. It also *'affords opportunities to seek rather than to comply, to experiment*

rather than to accept, to evaluate rather than to accumulate, and to interpret rather than to adopt. So it complies with these (and other) descriptions of technology-enhanced, student-centered learning environments by Hannfin & Land (1997).

Technological

Though technology enables us to create eLearning Environments and collaborative work environments, our course is no such thing. These already do exist, and our focus was to explore possibilities of technology that have not been used in education yet. Several students of the course addressed these possibilities as being 'interesting' and 'fun to do'. We describe these student evaluations later in this paper.

Cultural

Though there is a strong focus on 'competence' in regular Dutch education, the course has no compulsory exam. The learner's motivation determines what he or she attempts to learn or not. It is possible however to introduce self-assessment as well as exams for this course.

This approach might not work in common educational institutes, because of obligatory exams and obligatory courses. In our situation (life-long learners and distance education), it seems to be an approach that works for both learners and lecturers.

Pragmatic

We used the interactive possibilities of the Internet to overcome some typical problems that Learner-Centered Education brings in a 'classroom setting', like individual differences in learning speed, in background knowledge, in interest, and in view on logical sequence of learning material. From our point of view, many problems that exist in 'classrooms settings' can in a 'natural' way be overcome using technology that allows learners to define their own speed, order, location and time, as is common in distance-learning situations. Moreover, recent developments in Internet technology (such as Ajax, Adobe AIR) enable rich interactive interfaces, with better usability and multimodal communication (webcam, speech, text, whiteboard).

Student evaluation of the OpenER course HIP

Our course has been evaluated by students. They were split over two groups, one group (A) that just 'skimmed the surface' of the course and one group (B) that studied most of the course. Group A had 50 respondents, group B had 25 respondents.

The evaluation had some open questions as well as a list of words to choose from to describe the course. The list of words was identical in both evaluations, the open questions were different. From the list of words, multiple selections were allowed.

From the open questions for group A, we could see that most of the visitors found it interesting. Motives for visiting the course website varied from personal development to retraining. Some found it disappointing that the course is in English, while they expected a Dutch course.

From the open questions for group B, we concluded that the free course enabled students to get a taste from an unknown domain of interest. Additional comments included a

comment on the language (English instead of Dutch), a textual comment (typos), and one student found it rather easy (indeed, it is an entry level course). Most comments, however, underlined that students enjoyed the course, had fun completing it, found the course being well constructed and referenced, and hoped that the free course would prevent ‘cold feet’.

The evaluation based on word-selection was about ‘why the course lived up to expectations or why not’. Multiple selections were allowed. The selections resulted in the following lists (sorted from most selected to least selected):

Group A (n=50)	Group B (n=25)
Self learnable (32)	Self learnable (17)
Online (28)	Interesting subject (15)
Free (23)	Online (12)
Interesting subject (18)	Free (10)
Right length (6)	Right length (4)
Too difficult (1)	Too easy (2)
Not interesting (1)	Too short (2)
	Other (but not living up to expectations) (2)

Our goal was primarily to create an engaging learning experience for self learners. The fact that both groups found ‘self learnable’ to be the best way to describe the course, and the fact that group B (the group that studied most of the course) found it an ‘interesting subject’, means that our goal was largely met.

Yet, from the open questions we found there is room for improvement in the user interface. For example the graphical course overview was considered to be very useful, but this feature was not communicated clearly enough. The same comment was heard about other features, such as the additional literature feature, and the media feature. For the interactive elements, we already solved this by placing a distinctive box in the course content pointing to the interactive element. We consider a similar solution for the other features.

The HIP course as source of inspiration

At an internal Dutch Open University workshop on digital courses we were invited to present our course as ‘good practice’. Of the lecturers present, some had thought that digitizing a course was only about converting documents, books, and readers to PDF-format.

Our course was considered a good example of how to use Internet technology to engage students in an explorative learning cycle. Some quotes of reactions we had:

- *‘now that I’ve seen this, I think this approach might work very well in my field of study (Biology) as well’*
- *‘it is fun to see a clearly psychology related course appear in the context of computer science’*
- *‘I’m not sure if this approach can be applied to my course’*

It is remarkable that these colleague lecturers immediately considered how our approach could be used to 'digitize' their own course, without questioning the approach itself. We do realize that our approach might not fit each course, since it depends on the possibilities the course has to create engaging, interactive examples.

Valuable suggestions for improvement were:

- the course needs a better introduction
- the course needs to set clear goals
- the course might need a better way to guide students through the course

A last, frequently heard, comment was financial: it is quite costly to create courses with interactive elements.

Conclusion / Discussion

We showed the need for open source free knowledge in our modern society. We indicated issues related to the 'just-in-time' character of the need for availability of knowledge as well as for various types of assessment. We pointed to directions of business models that educational institutes will need to develop for these cases. We illustrated our ideas with examples of courses that we have developed so far. We do not consider the issues closed or the problems solved, but we hope to have shown there are ways to proceed. The future of the 'free knowledge' market will both be our aim and our inspiration for future developments.

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