

# E-LEARNING IN AN EBUSINESS MINOR, A PRACTICAL APPROACH

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## ABSTRACT

In this paper the authors present a generalized framework for small (typically half a year) educational programs in the field of higher education. This framework has been derived from experiences with an eBusiness minor which has been presented two times: in the fall and winter of 2003 resp. 2004 at the University of Professional Education in Utrecht, the Netherlands. The framework will be used as a reference on deciding how and where to use eLearning elements in such a program.

## 1. INTRODUCTION

### 1.1 Changes in the field of higher education

Since September 2002 the Netherlands have implemented the Bachelor/Master structure in the field of higher education, in line with the Bologna statement (1999), to create 'an open and transparent European Higher Education Area'. The University of professional Education in Utrecht (see [www.hvu.nl](http://www.hvu.nl) for more information on the University), has seized this opportunity to reform its curricula. One of the changes is the implementation of *minors* in the Bachelor programmes, a minor being defined as a coherent program of 30 ECTS (ECTS stands for European Credit Transfer System; 30 ECTS are equivalent to 840 hours or half a year of study for a full-time student). Minors supplement the students main course (which by contrast is called the *major*). Students with a major in Software Engineering can in this way broaden their scope with a minor in Human Computer Interaction, Business Informatics, eLearning or even Russian.

By introducing minors, the University of professional Education in Utrecht now has a very flexible system in which students may to a great extent follow their own interests in their professional education. Other elements in the curriculum where students may follow their own interest are traineeships and the thesis. These elements however are restricted by the topic of the chosen major.

Apart from changes in the structure of the programmes, the University of professional Education in Utrecht is rolling out eLearning tools. Contrary to countries as Australia where distance learning is necessary for people living in the interior, in the Netherlands the distances to a University are small (typically less than 50 kilometres). The need for eLearning tools comes from the increasingly dominant role of ICT, especially the use of Internet, in our society. Furthermore a paradigm shift has taken place in the field of education, from knowledge transfer to learning by doing where the quest for information and knowledge is now the responsibility of the student with the professionals in the roles of tutor and expert (see *figure 1*).

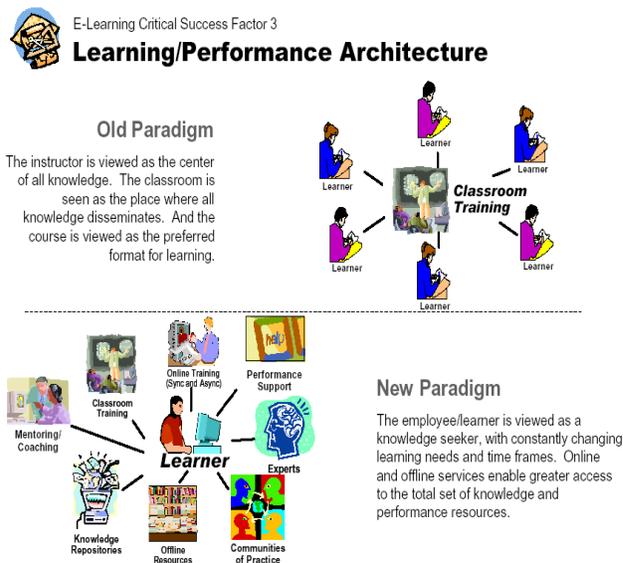


Figure 1. Learning/Performance Architecture (Gartner)

## 1.2 Solving problems with eLearning

Under the influence of the developments mentioned before, the essence in managing educational institutes is shifting from managing curricula towards managing the learning process. Electronic learning environments like Blackboard, Teletop or Lotus Learning Space offer educational institutes the possibility to develop flexible and transparent learning routes. Students are able to study and make assignments independent of time and place. No longer do institutes decide when learning takes place by planning lectures, but students are able to plan their own courses within given timeframes. The eLearning environment is integrated with university libraries, knowledge databases and other sources to help students with learning and assignments. Progress and results will be made transparent by posting assignments on the Internet and by integrating the student's digital portfolio in the electronic environment.

As we will show in this paper, eLearning does not only solve problems of time and space in learning (giving more flexibility to students and lecturers alike), it can also help organizations innovate and develop new learning modules more quickly by reusing learning objects; we will elaborate on this in chapter 4.

## 1.3 Current status of eLearning in the Netherlands

The last decade a lot of different eLearning-projects have been undertaken by Dutch educational institutes. We have seen universities implementing eLearning in entire educational programmes, in the process outsourcing eLearning technology or even content development (with the help of publishers and/or companies). Most of these first initiatives have been unsuccessful due to technological problems (e.g. bandwidth) or cultural problems: a lot of lecturers have had a hard time adapting to new ways of teaching. Today, most universities use a blended learning concept in which eLearning has a supportive role, although there are still courses that are taught exclusively via eLearning.

# 2 EXPERIENCES IN THE E-BUSINESS MINOR

## 2.1 The students and the curriculum

In this paper we will focus on a minor in *eBusiness*, a program developed for ICT-students from 3 different faculties by staff from these faculties.

The University of Professional Education in Utrecht offers 7 different Bachelor-programmes in ICT for students in three different domains:

- *Science*: Software Engineering, Information Engineering, Technical Software Engineering and Media Technology
- *Economics*: Business Informatics
- *Communication*: Communication Systems and Communication & Multimedia Design

From the start it was apparent that we had to deal with different educational cultures and different views on the subject. After ample discussions (in the best of the Dutch tradition) agreement was reached on the following starting points:

- An eBusiness application for a real organization should be the end-result of the minor;
- To provide a common language and understanding, a basic set of courses would be mandatory;
- Students should be able to tune the minor to their personal interests by following elective courses;
- The organization should provide a professional working environment, to stimulate students in working together in multi-disciplinary teams on the subject.

From these starting points the following program was developed:

1. Developing an eBusiness application for a real organization (12 ECTS)
2. Mandatory courses (12 ECTS):
  - Strategy, change and vision (3 ECTS)
  - eCommerce (3 ECTS)
  - eProcurement & supply chain management (3 ECTS)
  - Organization and business processes (3 ECTS)
3. Electives (totalling 6 ECTS); for example:
  - portfolio management (3 ECTS)
  - project management (3 ECTS)
  - knowledge management (3 ECTS)
  - XML (3 ECTS)

The 2004 program was equivalent to the 2003 program (except for updates in content).

## 2.2 The use of eLearning in the program

We decided to support the resulting program, with its focus on multidisciplinary, with an electronic environment which should meet with various demands. First, it should be possible to create a virtual office in which students can work on the eBusiness application, but also on cases and questions. Furthermore, the environment should help in the exchange of ideas and documents on various topics (student-student and lecturer-student(s)). Finally, the environment should provide a platform for discussion and assessments.

As not everyone (lecturers and students alike) was familiar with electronic environments, we decided that it should be an extra tool and should not replace other forms of education. This decision was strongly supported by our belief that students and lecturers from different backgrounds should meet physically on a regular base to create the necessary community feeling. So we chose for a form of blended learning as our didactical approach where Teletop (for more information on Teletop: see [www.teletop.nl](http://www.teletop.nl)) provided the electronic environment (virtual office and eLearning tool). For working on the eBusiness application and other cases we had real offices available as well. These offices were provided with computers, meeting table, etc.

Students had to deliver all their products (individual and team alike) via Teletop, thereby effectively using the eLearning environment. Lecturers were asked to use Teletop as the only way to provide students with documents: syllabi, sheets, articles, cases, etc. and to give feedback on students via Teletop. Apart from the exchange of documents, Teletop was used as the only tool for the communication between administration and students and lecturers. Examples are: schedules, announcements of guest lectures and results. As a rule the students knew that news, for the next day, could be posted until 18.00 hours.

Any other use of Teletop (e.g. the discussion board) was free, not required.

## 2.3 Experiences with eLearning in the minor

Looking back, the chosen policy has proved a sensible course:

- Students were informed in time on changes in the schedule – even last minute changes: a lot of students made it their habit to look on Teletop before going to the University.
- We accumulated a lot of useful material (and some rubbish as well) on the topic of eBusiness which can be re-used in the next courses.
- By monitoring the student discussions the staff was well-informed on relevant student-themes. A good example is the discussion on the use of software tools for creating the eBusiness application in which the students proved very creative in finding free tools.

The virtual office provided by Teletop was intensively used by all groups. Most groups in the last 2 years planned 2 to 3 physical meetings a week and did a lot of work at home while being in contact with other team members via Teletop. The group which was the exception on the rule decided to use the physical office on a daily basis (as a result we came to know these students quite well) and not to work from home.

Finally the use of Teletop as an instrument in evaluation was unintentional but provided us with quite important results. As an example we learned that students distributed tasks not on competences to be learned, but on the urgency of the task, thereby not always aiming on profit in educational terms but instead on rewards in the short term (which is probably a quite familiar pattern for anyone used in working with students). Also students were asked to match their competences in the field of eBusiness before and after the program (a questionnaire on the various competences we aimed for was developed for this purpose). This provided us with a valuable insight in the added value of the various elements of the program – which proved in some ways quite different than we expected before starting. In the next course we plan to monitor individual progress on a more regular base and thereby possibly eliminating the use of some exams.

## 3 CREATING A GENERAL FRAMEWORK

Based on our experiences with the eBusiness minor we decided to develop a general framework for the development of minors, i.e. a framework not depending on specific minor content. The building blocks that are used in a framework can have different forms of learning (e.g. theoretical, practical, individual or group assignments etc.). For all these different forms of learning a repository of educational components can be built. This repository has to be maintained on basis of new experiences and updated with new material.

The general framework (*figure 2*) consists of several standard modules (WP<sub>x</sub>), elective modules (KM<sub>y</sub>) and an overall project. The project has to take place within one of several predetermined domains (D). A domain can be both in profit (e.g. automobile) and non-profit (e.g. healthcare, government) sectors.

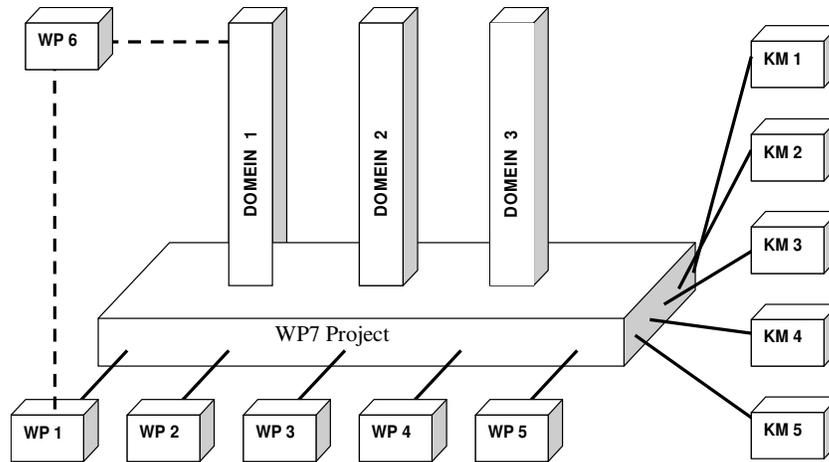


Figure 2. A general framework for minors

The different modules that are to be developed can have a complete different design. When designing a module we start with defining how a module is presented. For example in our eBusiness minor we have the standard module *eStrategy, Change and Vision* which consists of 14 lectures where we teach our students common concepts in eBusiness, next to this the students individually have to write a paper to be posted on Teletop after the course.

*eStrategy, Change and Vision*  
 This is an introduction module on eBusiness; what is eBusiness, what types of revenue- and business models are there? What are the latest trends and developments within business, government and society?  
 During the module we specifically pay attention to creating a vision of the future and how companies develop a strategy that leads an organization into the envisioned future and, of course, what tools do companies have for implementing change? Furthermore we give an introduction to concepts as marketplaces, eBusiness applications, supply chain management and customer relationship management theories and tools.

Of course not all modules will follow the same pattern; for some modules eLearning will be the didactical approach while other modules may have group projects with an external customer. The different module designs can be stored in a repository for ease of future use.

To ensure that all students will participate and reach basic learning goals we have dedicated one module (WP6) as a preparation to writing the final thesis. In this module a student most choose a specific domain and a topic (within the scope of the minor) on which a paper should be written (in the eBusiness minor this is the module *eStrategy, change and vision* as well).

Central in the framework is WP7: the project. The duration of the project is the same as the duration of the minor and consists of an assignment by a company (external partner) that is done by a group of four to six students. The project incorporates elements of all standard modules and preferably also of elective modules. In this way knowledge attained by the students in the modules will immediately be brought into practice.

Next to bringing together the different modules in the minor, the project also links the minor to the various *domains* in which a department is actively doing research (for instance within our university these domains are amongst others healthcare, retail and media technology). In this way the framework is applicable for all kind of different educations within different universities and across countries.

The framework has already been used in the development of other minors within the Faculty of Science and Engineering (e.g. the Extended Enterprise minor). In the development process the framework proved useful to the team in the way that it made obvious how all modules can and should be linked to each other. Additional, recycling of content of various minors proved easier.

## 4 THE ROLE OF LEARNING OBJECTS IN THE MINOR FRAMEWORK

A core concept in the approach to create the building blocks that are used in our minor framework is the learning object. In learning objects, content is broken down into ‘bite size’ chunks. These chunks can be independently created, maintained and reused, and like the well-known Lego building blocks, can be stuck together and pulled apart. A first step towards interoperable and reusable learning objects is to start with *educational components*. An educational component being a self-contained unit of education (from the point of view of the student), which can be studied (and assessed) in itself.

These components can also be stored in a repository; thus providing a step between the overall learning content and specific (much smaller) learning objects. Our current Minor framework consists of 6 standard modules, 5 electives and 1 project module, which means that we should try to transform these elements first into interoperable educational components (and afterward breaking down the educational components in reusable learning objects).

Let us start with the work packages, each of which in our general framework typically entails 3 ECTS or 84 hours of study. These 84 hours can be broken down into, let’s say, 21 educational components with the size of 4 hours (or half a day of study). An educational component should then contain the following metadata: educational component (x), prerequisites, didactical approach, introduction to the educational component, an outline of the assignments, required literature, use of tools and cases, definitions of competences to be achieved, information on the lecturer and course specifics. This means that the work packages are built-up as shown in *figure 3*.

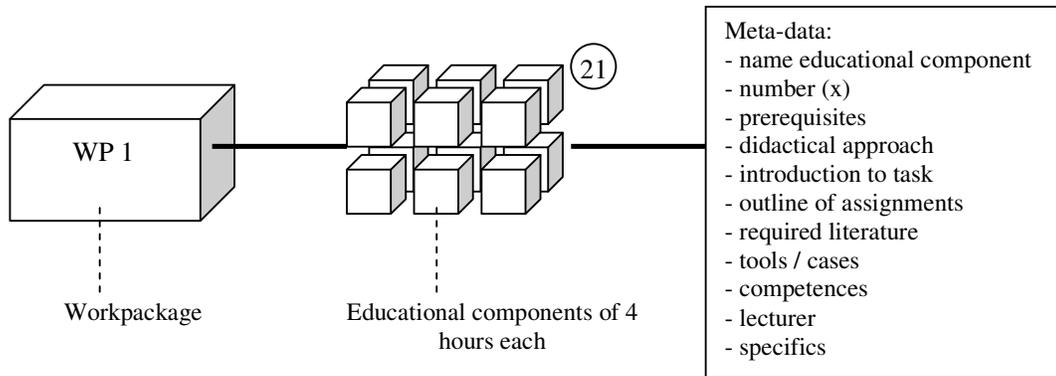


Figure 3. Educational components and metadata

In principle, it is possible to use the same set-up for the elective modules. However, in some cases the content of an elective module has not yet been broken down in educational components (e.g. when a student is asked to study some literature and make a summary). In cases like this, we define the elective as one educational component. In this way, it is still possible to create smaller and more specific educational components in the future.

Finally, the project-module entails 12 ECTS or 336 hours of study. The project can be subdivided into several educational components, where the size of each component depends on the specific project deliverable. A project educational component thus has a variable amount of study hours and encompasses a certain project-deliverable and a project domain. Notice that it should also be possible to attach educational components from work packages to project deliverables, to enhance the interaction between courses and the main project. This results in the following picture (see *figure 4*).

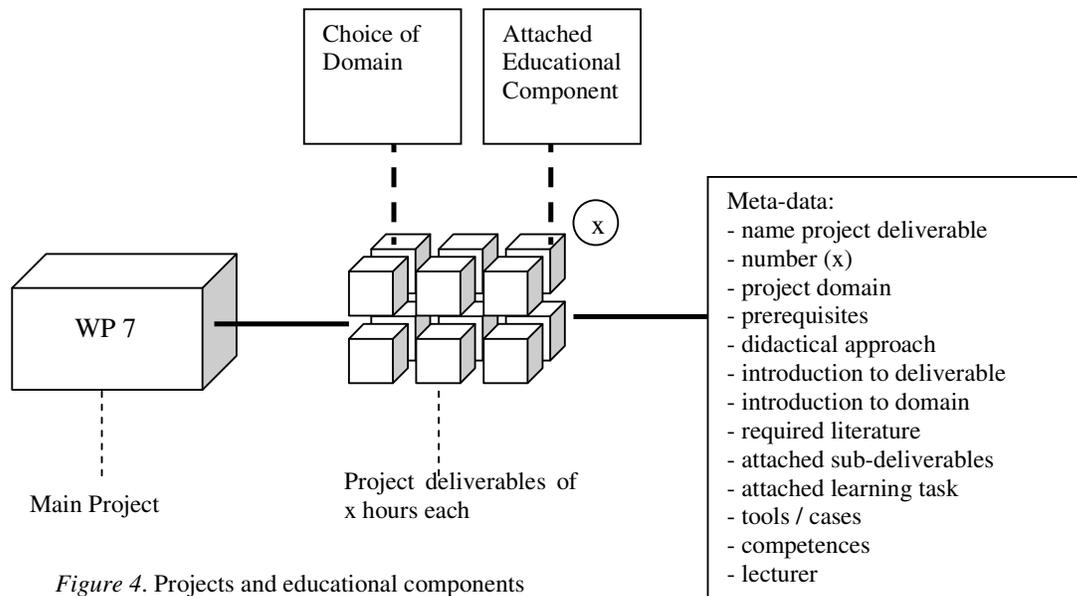


Figure 4. Projects and educational components

## 5 CONCLUSION: INDEPENDENT LEARNING

With the help of electronic learning environments (eLearning) it is quite possible that students learn the same, or even more, content than with the 'old' classroom-teaching method. As we have seen in the general framework it is possible to mix different types of learning concepts within an education (e.g. a minor) by using the concept of an educational component. As a result, students will have to get used to a more independent style of learning. Nowadays some courses are completely offered via eLearning while in other courses the eLearning environment is only used as a central point for the course overview, articles, presentations, references etc.

If it is decided to completely set up a course via eLearning it is very important to give the course a good structure. In other words, it should be very clear for the student what part of the theory and which exercises have to be studied and done in a certain amount of time. It is also possible to implement self-assessment tests that students must complete before starting on new learning materials. When it is necessary for a lecturer to be available for answering questions, this can be realised via a question and answering system where the student posts his questions and once a day the teacher replies. Problems can also be solved among students themselves via discussion groups. We think the general framework presented in this paper, may contribute to a good structure.

In short, students and lecturers may benefit from the use of eLearning tools and eLearning itself can be a major step towards autonomous learning.

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