

# The Added Value of E-learning

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## Abstract

Increasingly, organizations take decisions on the application of e-learning. In this paper we assert that the specific added values of the e-learning application depend on the type of learning. From a didactical perspective three types of learning are distinguished. These three forms of learning are 'ideal types', consisting of a combination of variables which collectively provide an effective way of learning. Various e-learning applications can support each of these three types of learning and thereby be an important aid to attaining the learning goals.

*I forget what I was taught, I only remember what I have learnt*

--Patrick White

## Introduction

E-learning (electronic learning) is one of the subjects currently much written about and discussed in academic as well as management circles. In the field of e-learning, however, there are still many aspects which need to be examined and defined. In this paper we have opted for a more detailed elaboration of the added value of e-learning.

The question we ask here is: which values are offered to students and organizations and, in particular, which of these values is the result of the application of e-learning?

In Section 2 of this paper we will briefly go into the content of e-learning and the definition that is subsequently used for the concept of e-learning in this paper. The development of all electronic applications which support learning and coaching are in the process of being developed. That is why it is impossible to draw up a definitive classification or description based on the technology and the current state of affairs in the field of e-learning. Neither is it particularly meaningful to develop such a classification because it will soon become outdated. Conversely, a categorization on the basis of the functions which e-learning can serve is much more stable and can be useful for a longer period of time. Consequently, in this section we

distinguish e-learning as a learning environment, e-learning as an environment for development and e-learning as a management environment.

In Section 3 we describe the added value that e-learning can offer learning.

In Section 4 a description of learning is given. This description is formulated from a didactic perspec-

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tive. Along with each of the three separate types of learning it is indicated whether, and to what extent, e-learning can play a significant role as learning environment, as environment for development and/or management environment. The values of e-learning applications are dealt with per type from the viewpoint of these three functions.

At the Royal Military Academy in the Netherlands we have undertaken three practical experiments with e-learning. In Section 5 we test the thinking on the added value developed in this paper against our experiences with these e-learning experiments. Not all expectations were realised in these experiments. These results can be explained by means of the model developed here. In the concluding Section 6 we draw up a number of conclusions based on this assessment.

## Typology of E-Learning Functions

### **Definition**

E-learning is an umbrella concept which comprises almost anything related to learning in combination with information and communication technology (ICT). Not surprisingly, we see that every article or book employs a definition of its own. One category of definitions focuses mainly on defining the technology on which e-learning is based. The definition below is a good example of this.

E-learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, PDAs) as they are developed and adopted. E-learning can take the form of courses as well as modules and smaller learning objects. E-learning may incorporate synchronous or asynchronous access and may be distributed geographically with varied limits of time. (Wentling et al. (2000))

A second category of definitions relates to the functions which e-learning can fulfil. In this paper we choose this perspective because the choice of organizations will have to be based on the functions which e-learning fulfils. Of course, it is necessary to always check whether the applications fit the current and future information infrastructure of organizations and students. The following definition of e-learning is the point of departure for this paper's argument. Not only the functions are clearly represented in this definition, but also the relationship with knowledge management is touched upon. We will not go explicitly into this relationship in this paper, although we realize that this is a particularly relevant and interesting subject.

E-learning is the use of internet technology for the creation, management, making available, security, selection and use of educational content to store information about those who learn and to monitor those who learn, and to make communication and cooperation possible.

The purpose is to support, expand, and increase the adaptability of the transfer and advancement of knowledge and skills.

(Telematica Instituut, 2001)

### **Learning Functions and e-learning**

In literature, many categories of e-learning can be found, but (as yet) there is no generally accepted categorization of types of e-learning. A more detailed arrangement of e-learning applications is necessary, however, in order to work out the specific values on this basis. The following classification is based on the functions which e-learning can offer in a learning situation.

- **e-learning as a learning environment:** one function of e-learning is to provide a learning environment in which existing learning activities are supplemented. This supplementation can consist of, for example, testing, preparatory, repetitive, deepening, broadening, and refreshing possibilities. Beside that, e-learning can also be used to replace (parts of) existing learning activities and/or to offer these in other working forms, such as virtual classrooms or discussion fora.
- **E-learning as an environment for development:** from a didactical point of view, e-learning offers the possibility of standardizing of best practices, for example by documenting much-used and proven didactical structures in so-called ‘software templates’. The use of the same multimedia material in several applications and the re-use of multimedia material in various applications in the development of new applications can be promoted by the use of so-called repositories.
- **E-learning as a management environment:** e-learning can monitor, stimulate, and adjust the learning process by means of various testing, registration, administration and communication possibilities.

In actual practice, for that matter, it appears that no strict division can be found based on these three functions and on the three types of learning described below (or based on more or less explicit didactic models) in the e-learning software on offer and that there is often an overlap, as a result of which several learning functions and types of learning are supported by the same software programme. (Smith and Hardaker, 2000).

## Added Value from e-learning

When choosing an e-learning application it is important to consider carefully which of the functions mentioned in the previous section one wishes it to fulfil and which added value it is to offer the learning process. After all, e-learning is a means and not an end in itself and technology should be prevented from becoming the leading factor. In this section we will go into the concept of value, the fact that ICT can offer new values and the specific new values which e-learning can offer.

### **Values**

Value can be defined as the meaning which is given to any property (whether or not tangible) or object of exchange. Educational institutions and training departments of companies are not used to thinking in terms of supplying values and receiving counter-values. It is implicitly assumed by the ‘customer’, the receiver of education, as well as the organization itself that the value consists of good-quality education. For educational institutions the recognized counter-value is receiving monetary compensation for the education supplied. Training departments of organizations usually implicitly assume the counter-value to be an increase in an employee’s efficiency and productivity as a result of the education received.

In this paper we propose that the relationship between educational institution (and from now on we also take this to mean the departments which organize training and education for members of the business community) can be compared to organizations which provide added value to their customers through their products and/or services. Though the question of supplying added value to teachers through e-learning is also particularly interesting and relevant, we will nevertheless leave this subject out of consideration.

### **New values**

The creation of values has always been an important point of attention for organizations themselves as well as for the disciplines which study organizations. In recent years we see that attention has shifted to new values which organizations can offer customers and vice versa. One important reason why new and other values have become readily identifiable is the advent of Information and Communication Technol-

## Added Value of E-Learning

ogy. Increasingly, we see (IC) technological possibilities being used to differentiate products and services and to apply advanced marketing techniques. Value in the form of supplying additional services around the products or in the form of custom-made products/services increasingly occupies centre stage.

Thanks to ICT applications organizations are capable of supplying the following values:

### **New values for customers/students**

- innovations,
- working at/improving customer relations,
- complementary products/services,
- working efficiently. (Amit en Zott (2000))

As a result of ICT possibilities, educational institutions can offer students new values to the same extent as other organizations, as shown in the box above. For these institutions the ICT possibilities are namely in the field of e-learning applications. For example, e-learning makes it possible to offer new education, with regard to content as well as didactical ways of working. Furthermore, the involvement and loyalty of students can be increased through e-learning, for example by increasing interactivity through discussion panels and virtual knowledge communities.

In the business community, but also in non-profit organizations, the importance of the information or knowledge the customer can provide the organization in the development, use, and evaluation of the services and products is increasingly recognized. Here too, ICT plays an important part, because ICT enables organizations to acquire and process this customer information and knowledge. Also customers of educational institutions or other training organizations can in turn make their increased knowledge available to the institutions and fellow students. Various e-learning applications play an important part here as well.

## **Values of e-learning**

The values offered by e-learning can roughly be divided as values which relate to quality improvement, on the one hand, and to cost reduction on the other. Much has already being published about the latter category, while a more detailed elaboration of quality improvement by e-learning has not received as much attention as yet. That is why we are focussing on the values regarding the improvement of learning in this paper.

In the diagram below we have indicated which values are offered by each of the various types of e-learning:

e-learning as learning environment	e-learning as an environment for development	e-learning as management environment
Better adaptation to individual needs	Quality improvement due to need for greater clarity	Transparency of the learning activities and process
More flexible choice	Efficiency due to re-use	Better adaptation to practice
Learning functions taken over by student and/or ICT	Standardization of best practices	Checking individual knowledge and skills
More attractive subject material	More uniformity and consistency in knowledge/skills	Improvement of the learning process

Communication is improved		The offer of acquired knowledge for the benefit of other students and the organization
More involvement by the student		

**Table 1. Values of e-learning**

## **E-learning as Learning Environment**

E-learning offers students more opportunity to engage in learning activities independently because they are permanently at their disposal and can be offered independent of place or time. Furthermore, e-learning makes it possible to offer the same learning content in various forms. Students themselves can then choose the form which suits them best. A simple example of this is the choice between listening and reading or both, or making a choice in the order of the material. Through e-learning the offer of the content can be tailored to personal needs (the starting level and the personal learning objectives). Communication among students themselves and communication with the teacher can be greatly improved because of e-learning being independent of time and place.

Particularly younger students are used to dealing with computers and multimedia. By incorporating ‘image’, ‘sound’, and interaction, the study material becomes more attractive and better suited to the students’ way of life as well as the future work situation. Consequently, student involvement in the organization and the learning process is increased.

### ***E-learning as an Environment for Development***

E-learning requires a much more distinct and detailed specification of the learning process and its result. Apart from the final implementation, this requirement alone can lead to considerable improvement in quality. Digitalization of the learning content can also contribute to more uniformity and consistency in knowledge and skills regarding content and level.

From the didactical point of view, digitalization of the learning content offers the possibility of standardizing best practices, for example by registering much-used and proven didactical structures in so-called ‘software templates’.

Use of the same multimedia material in various applications and the re-use of multimedia material in the development of new applications can be promoted by making use of so-called ‘repositories’. The availability of templates and repositories makes fast development of tailor-made applications possible, as a result of which knowledge can be spread faster and on a larger scale and it becomes possible, for example, to develop learning applications fast and effectively.

### ***E-learning as Management Environment***

With the management facilities offered by most e-learning systems it is possible to keep the publication, authorization and programming of learning activities transparent for all those involved.

E-learning offers the possibility of checking individual progress. This is interesting for educational institutions within the framework of following students’ achievements as well as for organizations because of the possibility to monitor the retention of the necessary knowledge and skills. A Human Resource System may indeed provide a detailed and up-to-date overview of the learning activities and experiences, but it remains to be seen whether the knowledge and skills are actually available. For chances are that certain

aspects are forgotten. By means of an e-learning system it is not only possible to test knowledge and skills regularly, but these can also be retained.

Learning activities in general should be in keeping with the practical situation. Didactically this is more effective and more efficient. Because of the integration of the acquisition and the application of knowledge and skills the practical relevance and applicability of the subject material is guaranteed to a greater extent. The variety of approaches resulting from this makes learning more attractive. By analysing anticipated activities and experiences (lessons learned), insight into the required knowledge and skills is created. This insight is often laid down in Human Resource Systems in the form of knowledge profiles (preferred profiles). By comparing this required knowledge and skills with the available knowledge and skills of individuals or areas of an organization gaps in knowledge and deficiencies in skills come to light. By adapting e-learning to this, made-to-measure solutions can be provided.

## Analytical Model

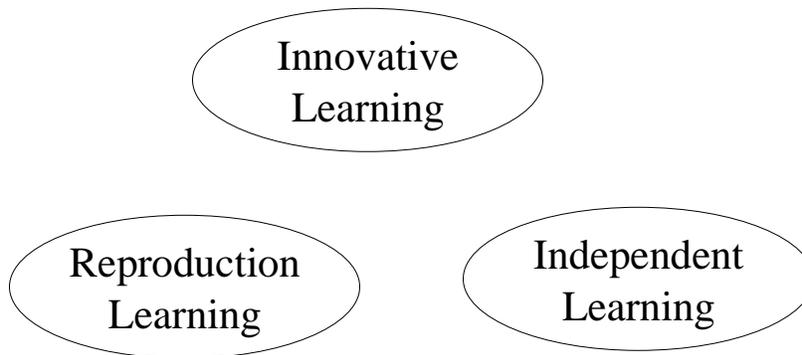
### ***E-learning versus types of learning***

Organizations cannot take decisions about which e-learning applications will be effective if there is no insight to begin with into the type of learning the application is expected to support. That is why we have tried to develop a typology of learning in this paper.

Our line of approach in developing a typology of learning is a didactical one. The process of learning is the central point here. On the basis of this typology we will address a number of questions per type. For instance we look at which learning functions play an important role and how this role is 'fleshed out'. We pay attention to which values these e-learning applications can offer the organization and those learning compared to the non-digital situation.

### ***Three Types of Learning***

In this sub-section three types of learning are reviewed, namely learning by imitation, independent learning, and innovative learning. Each of these types has its own *didactic line of approach*, based on theories about learning and cognition, about the definition of knowledge, how knowledge is transferred and what causes people to learn. For each of these types of learning the teacher has a specific role. The values provided by e-learning applications have to match each type of learning.



**Figure 1. Three types of learning**

## **Reproduction learning**

*“Learning how to walk”*

### **Didactical model**

In this type of learning the student is offered subject matter determined in advance by the institution. There is a didactical theory at the basis of this which is called “behaviourism’ or behaviourist/empirical (Resnick et al., 1996; Smith and Haraker, 2000).

Learning takes place individually, even though the students are placed together in a group or class. Students are seen as ‘empty vessels’ here, into which knowledge can be ‘poured’ systematically. The students are expected to learn (cram) the knowledge offered and be able to reproduce it, rather than to learn how to introduce patterns or frameworks into or even to produce new knowledge. The learning objectives apply to each student in general and are determined by the institution.

Learning usually has a competitive character, which is often stimulated by administering individual tests. The teacher’s role can be characterized as ‘trainer’.

### **Value model for learning by imitation**

In this sub-section we look at the variety of values which e-learning can offer for each type.

Learning by imitation primarily focuses on transferring information about a field of study. It concerns elementary knowledge which lays the foundation for the further expansion of knowledge. When e-learning is used, the student obtains greater freedom. Freedom is not increased with respect to the content of the course, but in regard to the learning pace, the location where students are studying and the time when they study. Besides this, e-learning offers possibilities to present the course material more attractively. It must be said that this is also one of the greatest pitfalls. Learning by imitation is a traditional form of education whereby there is a tendency to use ICT in a traditional way as well. Little or no use is made of the multimedia and interactive possibilities of ICT, and often the digitalization of books or other texts is considered enough. One important value of e-learning lies in the information about the quality of

the education. The educational institution is able to monitor the learning process carefully. For example, information can be obtained about the time of studying, the time spent studying by students, the time needed per subject, and so forth. This information can be combined with students' results or even with the results per subject. Links can be identified which can contribute to improving of the quality of education.

e-learning as learning environment	e-learning as an environment for development	e-learning as management environment
Better adaptation to individual needs	Quality improvement due to the need for clarity	Transparency of the learning activities and process
More attractive subject matter	Efficiency due to re-use	Monitoring individual knowledge and skills
	More uniformity and consistency in knowledge/skills	Improvement of the learning process

**Table 2. Value model for learning by imitation**

In Table 2 the relevant values are included which e-learning can offer learning by imitation.

## Independent Learning

*“Learning to find the way by oneself”*

### Didactical model

Students independently process the subject matter offered by recognizing patterns within it. The didactical model in this type of learning is constructivism. In constructivism it is asserted that each student is not an ‘empty vessel’, but already has various patterns of knowledge. Each new element that is learned is interpreted on the basis of the individually existing knowledge patterns and thus positioned in the knowledge of the person who is learning (Duffy & Jonassen (1992); Cobb & Bowers (1999)). In independent learning it is assumed that the student is motivated to learn if learning explores personal interests, values and experience; if learning contains self assessment as a result of which students feel they themselves are responsible and ‘owner’ of the learning process and if students have a long-term vision, particularly with regard to how the subject matter learned can be applied (Ball, 2000).

To a great extent students in this type of learning have copied the learning functions which were performed by the teacher in learning by imitation. These learning functions are not only related to the task goals (acquiring domain-specific knowledge and skills), but also to the learning objectives (generating cognitive strategies by themselves) and to monitoring objectives (which regulate behaviour in such a way that learning becomes possible). Here the teacher plays the role of coach in helping to discover and process the frameworks and models within a specific field of study.

### Value model for independent learning

Independent learning is no longer primarily about transferring information, but about understanding and insight. When applying e-learning we see that other values of e-learning become relevant, such as the improvement of communication and study skills. ICT plays a facilitating role here, as a result of which interactive and fast feedback can be realized. Questions can be asked online and can be answered quickly (once again independent of place and time) by a teacher or by fellow students. Research shows that students ask questions more quickly in e-learning applications than in classroom situations. E-learning offers a relatively safe environment to be able to ask questions which ‘cannot’ or ‘should not’ be asked in traditional classroom situations. Beside that, the increased independence causes students to feel more responsible for the learning process.

Students' motivation in independent learning is often increased by the increased degree of freedom. Also the way they are ultimately able to steer their education is often cause for satisfaction. It is possible to offer better use of the subject matter and the possibility to adapt this to the needs and interests of the students. The flexibility in the subject matter offered, concerning both content and usage, can increase when e-learning is applied. Moreover, it is much easier to find links when using ICT (references using hyperlinks, for example, so that it is easier to 'jump through' the subject matter). In Table 3 the above description is represented in diagram form.

e-learning as learning environment	e-learning as an environment for development	e-learning as management environment
Better adaptation to individual needs	Quality improvement by need for clarity	Transparency of the learning activities and process
More flexible offer of content	Efficiency through re-use	Better adaptation to practice
Student takes over learning functions	Standardisation of best practices	Monitoring individual knowledge and skills
More attractive subject matter	More uniformity and consistency in knowledge/skills	Improvement of the learning process
Improvement of communication		
Student is more involved		

**Table 3. Value model for independent learning**

Table 3 shows that e-learning can offer a great many added value(s) in all three environments.

**Innovative learning**

*“On the road together with a compass that is to be discovered together”*

Innovative learning is based on the didactical model of collaborative learning. Collaboration by itself is also an important learning objective here (Gokhale, 2002). The learning objects are determined by the group. The teacher is a participant in the learning process and learns together with the other participants during the learning process. Learning is not limited to a field of study but covers several domains. This paper asserts that the current knowledge-intensive organization and the knowledge society in general will increasingly ask for this type of learning.

Learning is enhanced when it is more like a team effort than a solo race. Good learning, like good work, is collaborative and social, not competitive and isolated. Sharing one's ideas and responding to others' improves thinking and deepens understanding. (Gerdy, 1998)

**Value model for innovative learning**

The Internet supported collaborative learning perspectives are used as a means of developing *virtual learning* within the school. Demonstration sites are being developed as a means of illustrating how technology is changing the learning process and identifying natural avenues forward for academic development. (Smith and Hardaker, 2000)

In innovative learning the content is as good as free. Consequently, there is no subject material and it is not possible to offer this in any way via e-learning. Innovative learning makes heavy demands on stu-

## Added Value of E-Learning

Students' independence and responsibility, both individually and as a group. Learning how to collaborate and involvement are central in this type of learning which focuses on the development of new knowledge. It is not at all about knowledge of a certain field of study anymore, but about development of knowledge across the boundaries of separate subjects. E-learning adds value because it makes communication possible. This can even mean global collaboration. Collaboration across borders has a strengthening effect on the development of new knowledge. Local paradigms can be breached by the new and different insights of fellow students elsewhere in the world. Beside that, the distinction between reality and the learning environment disappears almost completely. Offering this type of learning (actually it is better to speak of facilitating students in their learning process) is easy using e-learning.

The involvement and motivation of students can be improved by using e-learning. Beside that, it is valuable for the educational institution that new knowledge is developed by students. They can use this new knowledge again later (if it is transferable in some form or another) and it will also contribute to the image of the educational institution.

E-learning increases the possibilities to create so-called 'sticky knowledge'. This means that not only new knowledge is developed to enrich the students or groups that develop this, but that this knowledge also benefits groups that start learning at a later date. This knowledge does not only need to relate to content-related aspects, but can also be related to the learning process itself.

In Table 4 the above-mentioned values which e-learning can offer innovative learning are reviewed.

e-learning as learning environment	e-learning as an environment for development	e-learning as management environment
Student and/or ICT take over all learning functions	'Sticky knowledge' for future groups	Better adaptation to practice
Communication is improved		Monitoring individual knowledge and skills
Student is more involved		The offer of acquired knowledge for the benefit of other students and the organization

**Table 4. Value model for innovative learning**

This table shows that e-learning is especially important as a learning environment for the organization in order to organize and promote communication between the participants in the learning process. Since it concerns knowledge that is to be newly developed and is constantly changing, functionalities from the developing environment are only relevant to future groups. Monitoring the individual knowledge and skills in this type of learning is an individual responsibility which can be supported by e-learning. The possibility to keep the knowledge acquired and to put it to use for others is an extremely important added value which e-learning can offer.

## Practice: Three Experiments at the Royal Military Academy in Breda

Over the past two years, three e-learning experiments have been carried out at the Royal Military Academy which differ completely from each other regarding purpose, set-up, and e-learning application. (Jansen&v.d. Hooven (2000), Steenbakkens et al. (2000) and v.d. Hooven et al. (2002)). In this paper we dis-

discuss the point of these experiments, to what extent predicted expectations were justified and how these results can be explained.

### ***Electronic Teacher***

The first experiment concerns complete digital provision for the theory on Information Management. The theory was divided into clear subjects and for each subject simple (often military) practical assignments and questions were programmed so that serious answers to these would lead to students devoting themselves to the corresponding part of the textbook. This programme is termed the electronic teacher. The assignments are provided with clear feedback and a reference to the pages in the book. The purpose of this e-learning application (which has by now become a 'normal' part of the curriculum) is to offer theory in a more informal manner and adapted to student interests. The type of learning can clearly be characterized as 'learning by imitation'. The students are not challenged to look up other concepts than those which are offered in the book. The aim is to provide a foundation for the field of study. The programme is left entirely open. However, in theory students complete the assignments in a classroom, but they do this totally independently and at their own pace. The programme is also permanently available on the intranet and is also chiefly used by students to prepare for examinations in their own study space.

The experiences with this programme are generally positive. Most students clearly prefer this to lectures on the subject matter. The e-learning application provides the subject matter in a more appealing manner. For the teachers it means an important reduction of their teaching load. However, the main problem is that it has turned out that students who are not planning to study seriously can quickly click through the programme and then use the time to engage in activities other than studying. It is not possible in this e-learning application to check how much time anyone spends on a subject, whether there is any connection with the test results, in which subjects most mistakes are made, and so forth. At this moment work is being done on expanding the programme so that the learning process (also of individual students) can indeed be followed and improved upon. By testing this experiment against the values model, we can see that the values aimed at are indeed in keeping with the imitation type of learning, but the chosen e-learning set up cannot offer or support these precise values. In fact, monitoring and improving the learning process is impossible in this e-learning application. Therefore, the proposed improvements are entirely in the field of e-learning as management environment.

### ***The Study System***

The second experiment concerns the subject Economics and Finance Information for second-year students. Half of the army students were taught in classrooms and the other half studied with the aid of an interactive electronic application. The object of this experiment was to check whether two problems could be solved. The first problem concerns the huge differences in levels regarding prior knowledge of business economics among students. As a result, the classroom seminars are too slow for some students and too fast for others who have never had anything to do with economics. The second problem consists of the fact that at a later stage students do not remember the basic subjects already offered and studied.

An interactive computer programme with an advanced study system was used in this experiment to enable time and effort to be individualized. Students then receive information to match their effort in time with the achievement of the learning objectives. Using questions the programme tests whether a particular learning objective has been achieved and generates additional explanations and additional exercises if that is necessary. The programme works independent of time (an item does need to be studied within a particular week) or place.

The e-learning application also has to solve the second problem: not or hardly being able to remember the material. The fact of the matter is that in order to commit the material to long-term memory a number of

repetitions should take place. The interactive programme itself generates these points of repetition. If the student duly observes this then, theoretically, the material is committed to long-term memory.

Also in this experiment the experiences are positive. The majority of students (particularly those who already had prior knowledge of the field) preferred this way of learning. For teachers it means a marked decrease of the teaching load. Nevertheless expectations have not been completely realised.

The students themselves were actually responsible for doing the repetitions during the experiment. In practice it turned out that a considerable number of the experimental group did not comply with the repetitions. Possibly this was caused by the fact that there are no real incentives to carry out the repetitions. In the end the students were still assessed by an exam. Another explanation could be that the specific moment at which a repetition is to be carried out is too mandatory: once the material has been studied the repetitions are fixed. In this way the aforementioned independence-of-time element is seriously challenged. It is, however, interesting to see that within the experimental group of students who undertook the whole programme (including all repetitions) there is demonstrably better retention (recall) of the subject material than among the students who only undertook part of the programme.

If we also test this experiment against the value model, then we can establish that the intended learning during this module can be characterized as 'learning by imitation'. The content of the interactive programme (the function of presenting the subject material; e-learning as learning environment) goes well with this type of learning. The high degree of student independence, however, does not go well with this type of learning, as a result of which the values of the management environment did not come out well. With a more active role by the teacher the information of the study system can be used to improve students' learning results.

## ***Discussion Forum***

The third experiment concerned the subject 'The New Economy', for third-year students with Military Administration as their main subject. In this new subject ICT and the internet were given an important function. Topics such as subject description, learning objectives, programme and exam requirements were put on the web for this module. Furthermore, a special internet site was developed for this subject. Besides this, a few additional parts were added, such as recent (scanned) articles and various links to websites. The main innovation, compared with traditional educational structures, that was achieved as a result of implementing ICT consisted of the addition of a menu option which gave access to a discussion forum; a closed panel to which only students and coaches had access.

Central to the subject was the step-by-step study of a book chosen by the teachers. After studying each chapter students were obliged to exchange views on the discussion forum. Teachers tried to get the discussion going with their own contributions to this. Among other things, the seminars were used – under the guidance of one of the coaches (moderator) – to distil the main points from the panel discussion and thereby to end the discussions with concluding remarks.

In spite of the mainly positive experiences with this way of learning and the use of the internet and particularly the discussion forum, drawbacks to this approach were also found. Students as well as teachers found following the discussion forum time-consuming. The students pointed out that they viewed the teachers' input obstructive in the beginning. According to the students the discussion 'fizzled out' because of their input due to the teachers' superior knowledge. They would have preferred to see the teacher's role as a 'referee' who passes judgement on the quality of the contributions, not as a participant. This was gradually adopted during the course. Some students felt it was a pity that they did not receive a reply to their contribution immediately. Setting a deadline for contributions to the discussion had a positive effect on learning the subject material on the one hand, according to the students, because contributions had to be made, but on the other this involved higher pressure to study.

If we test this experiment against the values model we see that the aim was to give the students a far more central role in the learning process and to challenge them to go into the economic models more deeply. What has been referred to as 'independent learning' in this paper is what was intended. What we can conclude is that the approach chosen, and thereby also the e-learning application, does not go well with the intended type of learning. The discussion forum was at the centre, while this is a component that is particularly effective in innovative learning. Conversely, the strict way in which the learning process (including the management of the discussion forum and the fact that the book constituted the fixed basis of the subject material) was controlled, was much more in keeping with learning by imitation.

## Summary and Conclusions

Before starting e-learning experiments or other e-learning activities it is very important to check which type of learning the organization and the students prefer. Each type of learning requires different added values of e-learning. The difference in e-learning as an environment for learning, development, and management is also important here. The experiments described at KMA show that it is necessary to think systematically beforehand about the didactical model as well as about the desired values of e-learning. In these experiments not all expectations have been realized because the adopted approach did not always correspond with the learning situation.

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Added Value of E-Learning

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