ISBN: 978-989-8533-63-0 © 2017

LEARNING FACTORY – INTEGRATIVE E-LEARNING

Peter Steininger
FOM – Hochschule für Oekonomie und Management gGmbH, Steubenstraße 12, 68163 Mannheim, Germany

ABSTRACT

Integrative E-Learning (IEP): The goal of the project is the development and testing of an integrative teaching format for the assembly of imported, tried and tested (classic) teaching elements (e.g. wallboard and flipchart, screen walls and other visualization aids, Projector, manuscripts, and workbooks, etc.), with contemporary, innovative elements "new media". The solution to be developed in this project involves comprehensive, interrelated elements in an integrative holistic approach. The elements of the solution do not lie in isolation next to each other, but are tuned to one another and are used per the target, using and integrating results of LEARNING FACTORY a predecessor project. The intention is the "integrative e-learning environment" of the presence theory. The target group is every student.

KEYWORDS

E-Learning integrative, content, production, learning factory

1. INTRODUCTION

Integrative e-learning (IEP): The aim of the project is the development and testing of an integrative teaching format for the integration of imported, tried and tested (classical) teaching elements (e.g.: wallboard and flipchart, screens and other visualization aids, overhead projector, manuscripts etc.) (see Döring, Ritter-Mamczek 1998, p.133) of the university course with contemporary, innovative elements "new media" (see Klimsa 1993, p. 19). This is the target group of every student.

The solution to be developed in this project involves comprehensive, interrelated elements in an integrative holistic approach. The elements of the solution do not lie in isolation next to each other, but are tuned to one another and are used per target (Lehmann, Bloh 2002, p. 14). The intention is the "integrative e-learning environment" of the presence theory. The current state of research shows that this has become very strong in industrial sectors, which are strongly characterized by professionally developed products, that integrative approaches to teaching at universities are scarce. The approach is a combination of learning and working. This will encourage students to apply their knowledge about production processes gained during traditional class room lectures and to transfer it to computer supported learning on the web. Our syllabus is divided in two parts: The first part is content presentation via internet or intranet (within the university) for students; the second part is self study of special topics, concerning detailed process knowledge, and to apply lessons learnt in scenarios provided by inter-/intranet. This combination of traditional forms of learning ("class room learning") and e-learning is called "hybrid learning". Hybrid learning describes learning or training activities where traditional forms of training such as "class room learning" are combined with e-learning supplements.

There are many ways of combining these two principles of teaching and for every situation the right composition must be found. Also, the integration of hybrid learning into organizational settings poses challenges.

2. THE IDEA

The conceptual combination "integrative e-learning" is characterized by a didactic combination of methods, in which the individual elements are related and coordinated with each other. In the context of e-learning, the term "integrative concept" was used by Euler and Seufert (2005) as a further development of the "blended

learning" approach (Wissenschaftskommission 2008, p. 57), but the focus is on the interchange, effective complementation and change of methods in the sense of an overall concept. Integrative means more than an "enrichment" or "mixture", as the blended learning approach implicitly expresses - for example, it is assumed that the integration of computer-assisted teaching/learning offers also changes the pedagogy and learning and no longer (see Schulmeister 2001, p. 221 ff.).

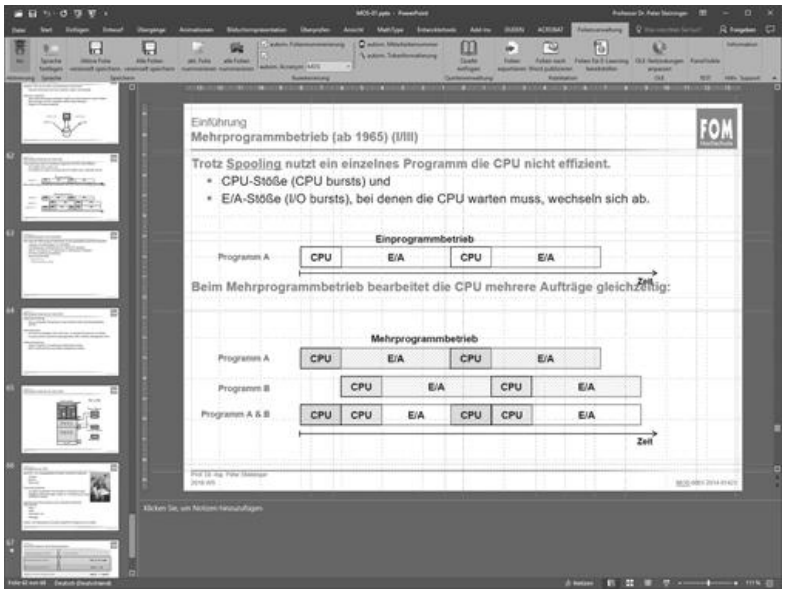

Figure 1. Microsoft PowerPoint with template and Extensions (for detailed menu, see Figure 2)

Therefore, one of the aims of the project is to merge previously separated solutions into a "solution landscape". Teachers should be taught the implementation, further development and maintenance of the processes for the creation of teaching materials per the conception of the pedagogy by means of information technology tools (see Figure *1* and Figure *2*). In the same way as the ERP systems pursue the value-adding process of the industry, the focus is on the actual task of the teacher at the centre and accompanying processes (if possible) are to be automated.

Figure 2. Extensions Toolbar inside Microsoft PowerPoint

Classical teaching elements, such as those used in presence events (for example, a wall panel, overhead projector, electronic presentation, etc.), are now usually supplemented with scripts. These scripts are, as a matter of experience, the result of a previous lecture which has been prepared "digitally". Today's (educational) offerings, such as iTunes-U or iBook's, create an expectation for students regarding learning materials, which can not be fulfilled by the classical methods and means.

IEP aims to create a prototypical process and system landscape based on common digital media (such as Microsoft PowerPoint, Web technologies, etc.), which enables an integrated approach, high-quality learning/teaching materials as a direct result of the preparation of the primary medium (presentation). Based on the methods used, students should be provided with learning materials, which can be derived directly from the teaching materials of the lecturer and achieve a qualitative standard that would not be achievable for the individual teacher without the process integration (see Figure *3*). The goal is to provide students with teaching and learning materials with similar quality as iBook's marketed by Apple (see Figure *3*).

All aspects of a multimedia teaching/learning scenario can be the object of the evaluation: learning software, learning environment and teaching scenario, authors, lecturers, learners and, finally, the interaction between the different persons and aspects.

The project "Integrative E-Learning" is to be evaluated continuously based on all the objects mentioned, even after completion of the grant. The evaluation results are to be used repeatedly during the project

promotion to influence the further development and thus to the success of the project and a high acceptance with apprentices and learners (continuous improvement process (CIP)). This is also the reason for the planned early use of the software developed in the project, to be able to go through several semester evaluations during the project run-up and, thus, to draw attention to faulty developments early on.

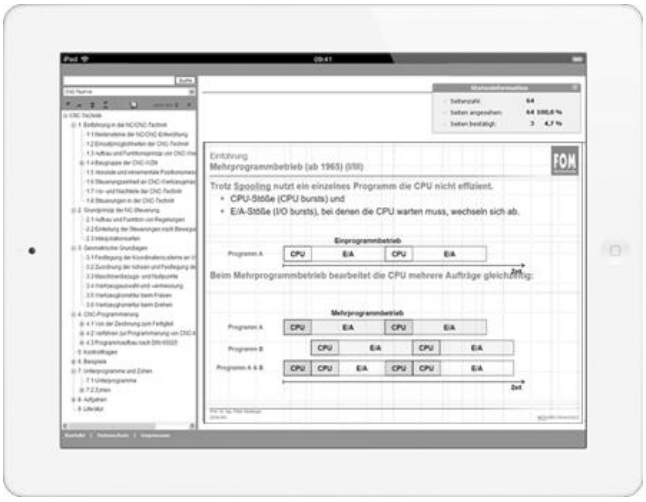

Figure 3. IEP viewed with an Apple iPad

2.1 Didactical Concept and Methods

To improve professional competence, curricula which have been, up now, handled individually should be combined. The holistic nature of production processes and the interconnections of individual sections should thereby be made apparent. In addition to the central question of how knowledge should be imparted, the question as to the means to be used, regarding the media for the transportation of knowledge, is also affiliated. Independent planning, execution and controlling of an operation are decisive for the training. Operation oriented methods are well suited to bringing this aspect across to the students. They differ from traditional instruction forms through a combination of target, content, methods and media areas, which is why one refers to multi-dimensional teaching learning-arrangements or hybrid learning.

One of the challenges facing the curriculum development was how to integrate technological applications into the curriculum. As the course goals and objectives were developed, it became evident that a textbook-based curriculum would not be effective. Furthermore, with the commitment made to internet technologies a multimedia-based curriculum was deemed more effective for students.

However, the curriculum could not take the form of a standard online course, where students would work independently of a teacher-facilitator in completing assignments. Instead, the focus shifted to a hybrid e-Learning course. The concept of hybrid e-learning incorporates online applications into the "live" arena of the class room. Such a course offers some of the conveniences of all-online courses without the complete loss of face-to face contact. Moreover, because the course would include students of differing abilities and differing learning styles, written and graphical materials could be presented in a range of formats to help make sure every student is fully engaged at least in the class activities.

2.2 Hybrid Learning

A mix of traditional teaching and e-learning has a lot of promising advantages compared to pure e-learning or pure traditional teaching. For example, one serious problem of e-learning is the loss of learners' motivation. Through recurrent class room meetings the teachers can better build up relationships with their students and are thus able to support them better during their e-learning sessions. Traditional teaching in turn cannot offer the time- and location-related flexibility of e-learning. If the students are distributed among many different locations, the number of physical meetings can significantly be reduced with the help of additional e-learning

units. If active learning materials must be used or traditional methods of organisational education must be applied, hybrid learning can also be the right choice. It can also be applied if there are topics in a syllabus of an organisational education plan that are practically impossible to be taught with electronic means like for instance how to apply social skills, how to carry on negotiations or other soft skills.

2.3 Interaction

Both the theory of transactional distance and the theory of equivalence view the dialog as a fundamental element of distance education. Teachers within this field must pay a lot of attention to get the students involved in the learning process. Hence, the distance education courses need to be designed and organized adequately to ensure dialog and interaction suitable for the various teaching tasks for different subjects for learners at different stages of studies. As a minimum, MOORE (1993) distinguishes between three types of interaction that must be practiced by distance teachers. He labels these as learner-content interaction, learner-instructor interaction and learner-learner interaction.

The first one, the learner-content interaction, is the intellectual interaction the student has with the subject of study. This type of interaction shapes the basis of all distance education, since it results in changes in the learner's understanding and contributes to his construct of knowledge. Without this specific interaction, there cannot be a distance education. In Moore's (1993) opinion the concept also includes internal didactic conversation, per Holmberg (1986) the oldest form of distance education aimed to facilitate learner-content interaction. At that time, distance education was based on didactic texts, printed material, in the shape of letters, assignments and gradually accompanying study guides. There was little or nearly no contact, neither with the instructor nor with other learners. With the evolvement of new media, computer software with interactive multimedia like CD-ROM and the Internet, the learner-content interaction expanded and got a new dimension. The concept is now used to describe computer-based learning programs designed as one-way communication programs with a subject expert, intending to help the lonely distant learner in their study of a specific topic. Moore and Kearsley (1996) regard some of these learning programs as solely content-interactive in nature. As the learner-content interaction is an absolute condition for all types of distance education, this is not the case of the learner-instructor interaction. Most learners regard this second type of interaction as desirable, but not necessary. It is however seen as important by most educators (for e.g. effective learning). Per Moore (1993), this is a way to increase the teacher's influence: "The frequency and intensity of the teacher's influence on learners when there is a learner-teacher interaction is much greater than when there is only learner-content interaction. The learner-instructor interaction is referred to as the "interaction between the learner and the expert who prepared the subject material or some other expert acting as instructor".

After having presented the content, the educator tries to stimulate and motivate the student in interacting with the subject and organize their application of what they have learned. Evaluation, counselling, encouragement and student support are important features of this interaction. The two-way interaction between learner and instructor requires however a high degree of learner autonomy and a feeling of confidence. To build this confidence, a tight communication between teacher and learner is provided, thus causing an additional workload on the teacher compared to traditional learning, where this can be handled during the class room presentation. The instructor's role as respondent to the learners' application of knowledge thus especially valuable, but must be perform in written form (e.g. via e-mail) instead of the less time-consuming oral form during class room lectures.

The third type of interaction, the learner-learner interaction, is, as the concept indicates, the interaction between one learner and another learner or learners, as a pair or in group settings, with or without the real-time presence of an instructor. Whereas learner-learner interaction among members of a class or a group is a resource of great value for learning, sometimes essential, his type of interaction is often considered desirable of pedagogical reasons. Research has shown that group interaction sometimes is used as strategy for learning. Not only face-to-face communication can be used to facilitate this type of interaction - also modern educational technology like e-mail, computer conferencing, distribution lists and virtual class rooms may contribute to reach this target. To decide when inter-learner interaction is desirable and effective depends however on the learning environment, the learner's age, their experiences and their learner autonomy. Moore (1993) proclaimed that just this third form of interaction, characterized as a new dimension of distance education, would be a challenge to our thinking and practice in the next years. Looking at different learning

environments, both in academia and in the workplace this prophesy proved. Most authors stress the importance to commit to all three types of interaction within one and the same distance education program types, not only to one of them. This implies to plan for the application of different types of medium and to develop a learning environment that fits different learning styles. On the internet, the students get feedback related to the actual studied pages, the reached learning goals and the topics they still must work through. Feedback means that the headings of pages seen and acknowledged by the student get a blue colour (colour is changeable by the course editor) in the course outline. The actual page is in red and the box on top of the pages (cf. Figure 3 in German: "Status information") gives information about the "performance", meaning total pages and pages worked through. These values are stored per user in the database for reuse.

For the next version of the hybrid learning system an "adaptive" content systems should be developed, which builds the curriculum on the knowledge of the students, who first completes an interactive query system. This query system was developed in another e-learning project and shall then be integrated into the herein mentioned system. The questionnaire data is transferred between the servers and the front-end with XML which uses SCORM DTD "QTIv1p1" (cf. Scorm 2002). This format was chosen since it receives direct support within the authoring system and since a possibility for data exchange with other systems implemented per this standard can take place. Furthermore, possibilities for transfer to other curriculum are provided within the query system itself. An interface has been defined which offers the possibility to exchange content with other query systems which use this standard, since the storage of the questionnaire content is not stored per SCORM DTD.

3. CONCLUSION

In conclusion, the development and implementation of a hybrid e-learning course is a complex work. We hope that Student enrolment will be high and that the variety of learning activities and opportunities in different media will promote better student performance and better student learning. Students should feel that they have ownership over their own learning process using more participatory and student centred learning activities. As a teacher, venturing into hybrid e-learning will change the way to teach as well. The goal is to integrate multimedia applications, internet applications and differing learning activities in all offered courses. Hybrid e-learning, though, is not for every class or for every student. Care and diligence must be taken in adapting any course to this format. However, with the right course, the proper learning goals, the right teacher, students and with a little creativity and risk-taking, any teacher would soon find that the imagination is the limit.

REFERENCES

Döring, Klaus W.; Ritter-Mamczek, Bettina, 1998. Medien in der Weiterbildung. Beltz, Weinheim.

Euler, D.; Seufert, S, 2005. *Nachhaltigkeit von eLearning-Innovationen: Fallstudien zu Implementierungsstrategien von eLearning als Innovationen an Hochschulen. SCIL Arbeitsbericht 4*. Universität St. Gallen, St. Gallen.

Holmberg, Börje, 1986. *Growth and structure of Distance Education*. Croom Helm, London.

Klimsa, Paul, 1993. *Neue Medien und Weiterbildung*. Dt. Studien-Verlag, Weinheim.

Lehmann, Burkhard; Bloh, Egon, 2002. *Online-Pädagogik*. Schneider Hohengehren, Baltmannsweiler.

Moore, Michael G., 1993. *Three types of interaction*. In: Distance Education: New Perspectives Eds.: Harry, Keith; John, Magnus; Keegan, Dermond. Routledge, London.

Moore, Michael Grahame, 1993. *Handbook of Distance Education*. Taylor & Francis Ltd, Abingdon.

Moore, Michael G.; Kearsley, Greg, 1996. *Distance Education. A Systems View*. Wadsworth Publishing, London.

Scorm, 2002. *Advanced Distributed Learning, Advanced Distributed Learning Initiative, Sharable Content Object Reference Model (SCORM™), Version 1.2*. Scorm White Paper, February 15, 2002. http://www.adlnet.org.

Schulmeister, Rolf, 2001. *Virtuelle Universität - Virtuelles Lernen*. De Gruyter Oldenbourg, München.

Steininger, Peter; Zülch, Gert, 2003. *Editing and Visualization of NC-Code in an E-Learning Project*. In: C# and .NET Technologies for Graphics, Visualization and Computer Vision. Hrsg.: Skala, V. Pilsen, Czech Republic: Union Agency – Science Press, (CD-ROM).

Wissenschaftskommision, 2008. Gesamtkonzept für die Informationsinfrastruktur in Deutschland. Berlin.