Blended Learning – the didactical framework for integrative qualification processes
Eric Schoop, Helena Bukvova, Steffen Gilge
Technische Universität Dresden,
Department of Business Management and Economics,
Chair of Information Management, D–01062 Dresden
{schoop|bukvova|gilge}@wiim.wiwi.tu-dresden.de

Abstract: The Tempus Tacis SCM project IQeG addresses qualification processes with regard to the integration of different dimensions. It seems appropriate to combine a mix of different teaching and learning methods for this purpose. In this paper we deal with the didactical model of blended learning, discuss feasible components of a blended learning environment, as applied at the authors’ chair, and finally present as a solution, which we derived from our practical experience, our future blended learning environment, the mobile ERASMUS module.

Key words: Blended learning, electronic learning, collaborative learning, situative learning, electronic government, Erasmus, Bologna Process

1 Context – Qualification processes in the IQeG project
The Tempus Tacis SCM project IQeG (integrative qualification in eGovernment\(^1\)) is considered as a platform for sharing experiences and fostering best practice in different fields of science and qualification, as related to the interdisciplinary theme of electronic government. Its qualification processes take different dimensions into account:

- **Intercultural dimension** – different study programs and administrative processes in 3 partner countries (Germany, Lithuania and Russia)

- **Interdisciplinary dimension** – the higher education partners\(^2\) combine different competencies (WIIM: information management,

---

\(^1\) Funded by the European Commission: SM_SCM-T037A05-2005

\(^2\) Germany: Technische Universität Dresden, Department of Business Management and Economics, Chair of Information Management – WIIM

Lithuania: Vilnius University, Kaunas Faculty of Humanities, Department of Informatics – VUKHF

Russia: St. Petersburg State University, School of Management, Department of Public Administration – SOM
process management; VUKHF: business informatics; SOM: public administration)

- **Intersectoral dimension** – qualification processes in higher education and in lifelong learning (additional partners: municipalities of the cities of Dresden, Kaunas, St. Petersburg).

2 **Blended Learning – Model and components**

2.1 **Concept of Blended Learning**

Learning is seen as an individual, sustainable process of adapting behaviour to new demands of a changing environment. Learning environments (or learning arrangements) describe deliberately designed situations in which learning processes take place, namely the influencing parameters and restrictions like time, place, content, methods, media, or forms of communication (Lang & Pätzold 2002, pp. 46).

If we follow the modern constructivistic paradigm, as reflected in the fundamental theories of problem based learning, the learner on the one hand is regarded as an active participant in the learning arrangement. He constructs his individual knowledge by integrating the new experiences into his already existing knowledge. On the other hand, a situative learning environment is recommended, as similar to the target knowledge application (working) environment as possible, to facilitate the learner to solve complex (authentic, real world) problems by interacting with other learners, field experts and tutors (Klauser et al. 2004, pp. 7).

Generally speaking, the working environment in “real world“ business processes is often determined by interactive decision making in groups. This demands learners to develop knowledge in the objectives to decide upon, in the methods to apply for decision making, and skills in communication and collaboration techniques. For convergence of both learning and later working environment, in the fields of business management and information management (our main teaching and learning topics) we recommend two dimensions of learning process objectives to be taken into combined consideration:

- **Integration of authentic business cases into the higher education learning process, to lessen the transfer problem of inert knowledge (topical dimension),**

- **Enhancement of traditional on site learning processes by an eLearning environment, to improve skills in handling modern ICT infrastructure – like multimedia tools, collaboration technologies, WikiWeb, etc. (technical dimension).**
With the pursuit of both topical and technical dimension in our blended learning environment we see us in compliance with the Lisbon Strategy, which shall transform the Bologna Process (Bologna Declaration 1999, pp. 241). It takes particularly the following three objectives into concrete consideration (European Council 2001, pp. 5):

- **Skills** – currently needed technical, social and personal competencies, giving an individual a secure foundation for life and enabling him to *work together in groups with specialists from other disciplines, intelligently using existing Information and Communication Technologies (ICT)*,

- **Adaptability** – the *ability to learn about and adjust to new situations*, while staying independent and respecting others, and

- **Mobility** – the skills required in today’s international and multicultural society, especially the *ability to work and communicate with others across national boundaries* and by this to adapt to the challenges of a global economy.

The term “electronic learning” or “eLearning” which we used above, when describing the technical dimension, refers to a learning environment, in which modern Information and Communication Technologies (ICT) are used as a means to facilitate the learning processes. Further, we distinguish between self-guided individual learning, based on didactically accentuated online learning content to be delivered via the Internet, on the one hand and collaborative learning in small learning groups mainly using the communicative features of modern asynchronous or synchronous ICT in the virtual classroom on the other hand (Schoop et al. 2005, p. 112). The didactically reasonable combination of both traditional classroom learning processes and online learning processes in the virtual classroom, based on new ICT infrastructure and services, is called “blended learning” or “bLearning” (Seufert & Mayr 2002). We do not see eLearning as a better alternative in comparison to traditional learning methods, but rather as an enhancement rendering under certain conditions additional value (e.g. when bridging regional/national distances between learners). Therefore we refer in the following to the term “bLearning”.

Figure 1 describes the most usual occurrences of traditional and virtual teaching and learning processes in a bLearning environment. The combination of personal, physical and time based dimension leads to 8 different occurrences:

1) Asynchronous individual learning process in the real classroom (e.g. reading a textbook)
2) Asynchronous team learning process in the real classroom (e.g. blackboard communication, business games)

3) Synchronous individual learning process in the real classroom (e.g. traditional classroom lecture)

4) Synchronous team learning process in the real classroom (e.g. business case exercises in small teams)

5) Asynchronous individual learning process in the virtual classroom (e.g. self guided individual online learning – web based training)

6) Asynchronous team learning process in the virtual classroom (e.g. virtual collaborative learning using discussion forums, email or news lists)

7) Synchronous individual learning process in the virtual classroom (e.g. tele-lecture in an open distant learning environment)

8) Synchronous team learning process in the virtual classroom (e.g. chat, audio conference or video conference).

![Blended learning environment – a combination of different dimensions](image)

**Figure 1: Blended learning environment – a combination of different dimensions**

### 2.2 ICT Infrastructure and services

To take advantage of all occurrences of a bLearning environment, as precondition appropriate ICT infrastructure and services have to be provided for the support both of traditional and virtual classroom learning
environments. We suggest a three-tier architecture of a learning management system (LMS), best to be based upon open-source platforms\(^3\):

- **Portal**: unrestricted access for all interest groups to basic structural information (e.g. about the Chair’s personnel, fields of interest, list of publications, study program, course modules, operational details, etc.)

- **Foyer**: personal access for registered users (students enlisted in our courses) to dedicated information (e.g. style sheets for course assignments, full text of the Chair’s scientific publications, diploma and seminar theses, etc.)

- **Community**: closed area with self-registration facility for admitted students of specific courses
  - to get access to related content (e.g. electronic scripts and textbooks, online interactive learning materials, actual students’ assignments, FAQs, etc.),
  - to communicate with peer learners, field experts (optionally) and tutors in a discussion forum, and
  - to contribute to a collaborative WiKi-hypertext building structural meta-information about the course modules of the Chair in relation to other modules of the Department and to external web information.

### 2.3 Production and provision of online course materials for individual self-guided learning

A bLearning environment integrates the traditional and the virtual classroom and enhances traditional learning materials (e.g. scripts or textbooks) by multimedia-based, interactive online course materials. Their provision in forms of online courses, the learners’ administration and the learning process control are supported by Learning Management Systems (LMS). These follow widely accepted open learning standards (e.g. SCORM – sharable courseware object reference model – c.f. Advanced Distributed Learning Initiative, 2006.) and are not discussed further.

To meet both the didactical requirements necessary to provide didactically accentuated online course materials (following the problem based learning principles) and the economical and technical requirements necessary to provide interchangeable, efficiently re-usable learning contents (based on XML standards), we took an integrative approach. Following the outlined

---

\(^3\) At WIIM we use the web content management system “typo3“ ([http://typo3.org](http://typo3.org)) and the learning management system “Ilias“ ([http://www.ilias.de/ios](http://www.ilias.de/ios))
process model of figure 2, within the research project IMPULS$^{EC}$ in 3 years the prototype of a production line based on open XML standards was developed and used to produce more than 200 online learning hours on topics of eCommerce. Our production line supports distributed authoring processes and a central project management (e.g. for quality assurance). It is open to export online course materials, which are structured by proven didactical principles (modelled as a problem based learning XML scheme) and can be adapted to specific contexts. Several SCORM compatible LMS have be addressed and tested as potential eLearning platform (Jungmann 2005, pp. 43).

Figure 2: Integrative process model for the production of didactically accentuated online course materials

2.4 Augmenting traditional lectures and individual online-learning by collaborative learning

Following Klauser et al. (2004, p. 7), “[...] learning is seen as an active, socially transmitted and situated process of the individual construction of knowledge and ability, desire and feeling”. This social and situated context of learning is given by the learner’s integration into his learning environment. In this, interactions take place with teachers/tutors and other learners. Therefore, our students can be seen as members of a group with – at least partly – common interests and goals.

---

4 2001-2004, funded by the German Research Ministry (BMBF), no. 01 NM 067 D; for details see http://www.impuls-ec.de
Bair (1989, p. 209) described in his *pyramid of interaction* 4 levels in succeeding order, which demand increasing cooperation, mutual understanding and interdependencies between the members of groups (see figure 3). On the *informing* level, the group’s members do not necessarily know each other; they interact by using a common information platform (e.g. database, website), following their individual goals. On the *coordinating* level, individuals are aware of being members of a community, they share common interests, but still follow individual, different goals. The *collaborating* level, in contrast, demands regular interactions and has a common process and a common goal for all group members, which can be sub-divided asynchronously in parallel tracks to achieve different sub-goals. On the highest level of interaction, the term *coordinating* describes groups with common process and common goal and tight, undivided interactivity, mostly synchronous.

If we apply Bair’s pyramid to our learning environment, for best possible results (i.e. creating sustainable knowledge) learning processes should rely on interactions between students and teachers (teaching staff and additional field experts) and should take place on the highest possible level in this pyramid. Therefore we augment our compulsory courses (i.e. traditional lectures and tutorials – levels informing, coordinating) by case study seminars, to cover Bair’s levels collaboration and cooperation. The small teams consist of up to 15 selected students in their last year of studies. These share similar academical pre-knowledge and a common interest in the chosen business case study. The teams are supervised by several tutors and field experts. Main intention is to enhance the students’ social competencies (e.g. communication, collaboration, written and oral presentation) as well as reinforcing their factual knowledge, already gained in former courses, by
practical problems and solutions in authentic business situations\(^5\). The seminar, therefore, mainly focuses on synchronous on-site group work using complex and ill-structured case studies that are especially aligned to this learning environment.

Regarding the European context, as introduced in chapter 2.1, this case study seminar concept certainly is fit to accomplish the 3 presented didactical aims of the Lisbon Strategy. But an international implementation demands first, to synchronise seminars in different European universities (by topics and cases, time, and size of participants), and secondly, to bridge the distance between the group members to participate. To solve these problems, we have to move from the real classroom (on-site seminar) to the virtual classroom.

If we concentrate upon interaction and communication in learning teams in the virtual classroom, we have to answer the question, how – international – virtual collaborative learning (VCL) projects, based on business case studies, should be organised and operated. In a series of meanwhile 18 VCL projects – 6 international projects\(^6\) – we recognised that it is not sufficient just to provide collaborative information infrastructure for eLearning communities, offering readings for download, and synchronous and asynchronous communication platforms – and then leave students on their own. If we want to achieve results similar to those in the on-site case based seminars, we need to take a systematic and controlled approach. Therefore, in our opinion a VCL project has to be far more than just an open learning community. Based on our findings, we developed a \textit{conceptual model} for planning, designing, preparing, operating and evaluating virtual classroom projects under continuous moderation and reflection by trained tele-tutors. Characteristics of our VCL approach are

- Separation of collaborative projects into 5 phases with the tutor’s decisions in each phase influencing later settings,
- Formation of heterogeneous, self-organised groups with 4 to 6 members collaborating on complex problems which have open solutions,

\(^5\) E.g. in the IQeG project the analysis and modelling of administrative processes in Dresden municipality

\(^6\) In the context of the named IMPULS\(^{EC}\) project, we put up a series of deliberately varied settings of virtual classroom projects. The findings of more than 3 years of empirical research are discussed in Balázs (2005). They are the basis for our current international VCL projects.
• Assignments embedded into an authentic cover story modelled as business case, the students taking over specific roles and achieving task solutions as collaborating teams,

• Evaluation of students based on a mixture of group achievement, individual communicative performance, role fulfilment and intra-group reciprocative assessment,

• Advance information of both tutors and students in forms of detailed guidelines, informing about the case, the roles, the tasks and the assessment criteria, and giving hints about potential drawbacks, conflicts and possible solutions,

• Application of intense tutoring in forms of coaching, giving feedback and motivating, not influencing or teaching task solutions.

VCL projects typically last about 2 to 3 weeks, demand a high weekly workload both from students and from tutors (on the average 1 h per student and day for each team member; about 1 h per student and week for the coaching and assessing tutor), and may easily produce up to 1,000 and more qualified postings with significant (task relevant) content. The optimal number of participants is 20–40 students in total, to be divided evenly by the number of participating universities (e.g. the VCL in the IQeG project consisted of 6 tri-national teams with 2 members of each country per team).

The main didactical objective of VCL is the acquisition of the following competencies:

• Improved professional competence by active knowledge sharing in heterogeneous groups,

• Improved team competence by deliberately following roles and scenarios, the interaction and communication following certain rules and standards,

• Improved media competence by having to rely upon Internet technologies, and to cover up with it’s pros and cons while achieving tight project schedules, and

• Improved intercultural awareness by collaborating in internationally mixed teams with students and tutors who have different cultural and academical backgrounds.

In compliance with the aims of the Lisbon Strategy, we believe these to be core competencies for students passing higher education and starting to work in a business or administrative context similar to the former problem based learning scenarios. For details of our findings concerning the
effectiveness of international VCL projects, see Schoop et al. (2005, pp. 114).

3 Conclusion: the mobile ERASMUS module as a European blended learning environment

When integrating international higher education learning processes, the question arrives, how our experiences could contribute best to the aims of the Bologna Process. We suggest bLearning for an improvement of the ERASMUS scheme. As part of the Socrates II programme, it has been introduced as a measure to support the aims of the Lisbon Strategy by enabling the geographical mobility of higher education students and teaching staff within EU member states. While the student mobility especially aims at fostering the individual development, by this laying the fundamentals for an European citizenship, the teaching staff mobility brings the European perspective to the home country of those students unable to participate in student mobility (European Commission 2002, pp. 3).

Honouring the successful implementation of the ERASMUS scheme, we nevertheless bring forward its underlying economical problem, best to be described as a two-faceted mobility-trap:

- Due to the limited financial resources of the ERASMUS scheme not all European students can take part in an exchange programme, even if they would like to use the student mobility (limited geographical mobility).

- Due to the teaching obligations of lecturers in their home university, they cannot teach a whole module in the normal semester scheme of the guest university with, for example, a lecture every week (limited time mobility).

On the one hand the mobility-trap on the students’ side will result in an unequal treatment if not everybody can participate in international exchange, thus torpedoing a broad European integration. On the other hand the mobility-trap on the teaching staff’s side realistically only leaves the possibility to give a number of lectures en bloc in a one- or two-weeks-visit. This is strengthened by a financial consideration, namely the mobility support for teaching staff being 800€ per week for a period of one week to six months with a total sum not exceeding 2.000 €. Besides this, a one- or two-weeks-visit does not allow for a complete course module of at least

---

7 ERASMUS = European Community Action Scheme for the Mobility of University Students
8 Socrates II = European Community action programme in the field of education (2000-06)
three ECTS credit points (about 90 hours of workload), attracting students to take it into their curriculum.

To solve the mobility trap problem, we suggest the usage of mobile ERASMUS modules. Mobile stands for multimedia open blended international learning environment and introduces several virtual elements into the teaching processes, by which the mobility-trap of the ERASMUS scheme is resolved and the requirements on the personal growth of the students in respect to their skills, adaptability and potential mobility are taken into account. The mobile ERASMUS module addresses all four BAIR-levels of interaction and delivers e.g. a 4 ECTS credit points module (120 h student’s workload; see table 1 in relation to figure 3).

Table 1. Design of the mobile ERASMUS module [relating to BAIR-levels of cooperation]

<table>
<thead>
<tr>
<th>Phase (Workload) [Bair Level]</th>
<th>Forms and Contents of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Website information and kick-off (remote) lecture containing:</td>
</tr>
<tr>
<td></td>
<td>- organisational announcements (e.g. tasks, partners)</td>
</tr>
<tr>
<td></td>
<td>- introduction to the concept of blended learning, to the module’s procedure and of necessary software to be used</td>
</tr>
<tr>
<td></td>
<td>- definitions of essential terms of the domain dealt with</td>
</tr>
<tr>
<td>1 Information (~5 hours)</td>
<td>Individual self-guided, self-paced learning using online learning contents provided</td>
</tr>
<tr>
<td></td>
<td>- Common solution of the complex problem of a task given in small (2-3 students), self-organised on-site groups, by working out a 15-20 paged assignment within 2 weeks</td>
</tr>
<tr>
<td></td>
<td>- Use of an Internet based forum for discussing contents and posting organisational messages</td>
</tr>
<tr>
<td>2 Self-guided Learning &amp; Assignments (~40 hours) [Coordinating]</td>
<td>Seminar-Style Workshop guided by the lecturer within 1 week:</td>
</tr>
<tr>
<td></td>
<td>- Monday (4 hours) + Tuesday (4 hours a.m.): presentation and discussion of the assignment (preparation: 3 hours)</td>
</tr>
<tr>
<td></td>
<td>- Tuesday (4 hours p.m.) + Wednesday (4 hours a.m.): individual work on intensive readings prepared by the lecturer</td>
</tr>
<tr>
<td></td>
<td>- Wednesday (2 hours p.m.): lecture systemising and deepening special aspects of the domain dealt with (individual post-processing by students: 4 hours)</td>
</tr>
<tr>
<td>3 Presence Week (~35 hours)</td>
<td>- Thursday (8 hours, a.m. + p.m.): group work on business case studies and presentation (assessment) of the solutions</td>
</tr>
<tr>
<td></td>
<td>- Friday (2 hours a.m.): organisational preparation of the subsequent phase 4</td>
</tr>
<tr>
<td>VCLSession</td>
<td>Virtual Collaborative Learning Session (mainly using ICT for solving ill-structured tasks and documenting findings) containing:</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(~40 hours)</td>
<td>• Provision of preparatory material in the virtual classroom</td>
</tr>
<tr>
<td>[Collaborating]</td>
<td>• Videoconference Kick-off (Introduction of Partners, Tutors, Sequence, Tasks, Roles and Assessment Scheme)</td>
</tr>
<tr>
<td></td>
<td>• Collaborative, self-organized, tightly tele-tutored team work on the solution to the task given (international teams of 4-6 students, with individual pre-assigned roles) lasting 2-3 weeks</td>
</tr>
<tr>
<td></td>
<td>• Final Videoconference with split-presentations (each site supplies one presenter) of the team work results</td>
</tr>
</tbody>
</table>

∑ = ~120 hours  ∑ = 6-7 weeks (within: 1 on-site week with lecturer present)

This innovative bLearning environment is intended for international usage, integrating 2 or 3 sites. Consequently, the phases 1-3 of the model will have to be provided consecutively at two or three ERASMUS partner universities by the teaching staff, giving the introductory lecture via videoconference and travelling there for the one-week workshop in phase 3 on ERASMUS teaching staff funds (i.e. 800 € per week). The lecturer, when setting up the international groups in phase 4, has to bear in mind that the students from the different sites do not know each other. Hence, but not only in this case, the preparation of the virtual phase 4 needs special and extended attention. Additionally, the lecturer has to integrate the mobile module into several different systems and schedules of studies at the respective partner universities. During the on-site week he also has to keep in mind that the students have to attend (or at least work for) other courses in the curriculum as well.

A first run of a mobile ERASMUS module in the summer semester of 2006 successfully integrated courses in Szczecin/PL and Dresden, and proved the solution as principally performant, being both effective (regarding the students’ achievements) and acceptable (evaluated students’ opinion). Our next steps will address the further standardisation and evaluation of the model and the creation of a mobile ERASMUS module partners’ network for the reciprocative application of the concept.

Thus, we believe, highly attractive and flexible international, interdisciplinary course modules can be created, with each partner enhancing his core competencies (export module) by imported supplementing modules. This could be a first practical step on the long way to completely integrated international study programs.
4 References


Schoop, E., Michel, K.-U., Miluniec, A., Kriksciuniene, D., Brundzaite, R. (2005). *Virtual collaborative learning in higher education and it's potentials for lifelong learning - an empirical approach.* In: