Open educational resources or closed learning management systems? –The Challenge of Designing ICT Support for Learning Communities in Higher Education

Patricia Arnold
University of Applied Sciences Munich, Germany

Abstract: ICT support for learning communities in higher education has become commonplace over the last decade. Within universities, there are usually various bottom-up initiatives, using different tools and educational designs to support learning and teaching. As this often takes place with little or no strategic approach to sustainability, at a given point universities strive for an “e-learning strategy”: They try to streamline the various initiatives and to endorse a learning management system that works across faculties. But how to design a strategy and sustainable support services that embrace the expectations of all stakeholders? To add complexity to this design process, there is not only a broad selection of learning management systems available for higher education, but also a strong movement pushing for web 2.0 applications and open educational resources instead of closed learning management systems. Thus – often incommensurate - expectations fly high from all sides. This situation forms the backdrop of the investigation at hand: The paper describes and analyses a participatory planning and implementation process of an e-learning strategy and implementation system at a higher education institute. It focuses on expectations that arise and have to be dealt with - both expected and unexpected ones, with a special emphasis on the inherent tension between implementing a closed learning management system and designing for open educational resources. Furthermore, it looks at unanticipated alliances and at unexpected turns in the development process. Results can inform similar design processes that need to resolve the inherent contradictions between open and closed systems as well as top-down and bottom-up approaches to changes of a learning culture.

Keywords: e-learning, learning communities, learning management systems, open educational resources

Introduction

The widespread use of information and communication technologies (ICT) to support learning and teaching presents a great challenge to universities as complex organisations. To what extent do traditional brick and mortar universities want to enrich their study programs with flexible online formats, often subsumed as “e-learning”? Which technologies should be

1The term “e-learning” is used in its broadest meaning in this paper, including all forms of ICT support for learning and teaching in formal and informal settings, regardless of the specific
officially endorsed by the organisation? Which support services are needed? How to develop educational designs that enhance the quality of teaching in different faculties? Which technologies and which organisational frameworks are needed to enrich the students’ experience of studying? The agenda of questions is long as is the list of options and possible directions to take.

Recently, in many universities a broad variety of pioneering projects have been set in place, using ICT in various forms and formats, but with little or no strategic approach to sustainability. Thus, the need for “e-learning strategies” has been recognized. An “e-learning strategy” refers to a comprehensive set of goals and directives, elaborated and endorsed by university management, for the sustainable implementation of ICT support for learning and teaching (cf. Kerres 2005, Arnold, Mayrberger & Merkt 2006, Stratmann & Kerres 2008). With e-learning strategies universities try to streamline existing projects and initiatives and embed them in a comprehensive master concept, in order to bring e-learning within the organization onto another level. Top-down directives thus supplement bottom-up initiatives.

The latest development strives for opening up higher education by making educational resources also accessible to people not enrolled in the university - and for other lecturers to re-use, adapt and refine. Massachusetts Institute of Technology (MIT) with their OpenCourseWare Initiative (OCW) is the most prominent example.

Research in the field of ICT support for learning and teaching usually focused on one of these aspects: educational designs, selection and affordances of technologies, e-learning strategies. It quickly became evident that all these aspects are deeply interrelated (e.g. Arnold, Mayrberger & Merkt 2006) as is the newest of all choices – the grade of “openness” a university strives for. This complex interplay constitutes the main challenge for universities in our fast moving “digital age”.

This situation forms the backdrop of the case study I present in this paper: After many years of experimenting with technologies and establishing various pioneer projects in different faculties, my university decided to develop an e-learning strategy and to implement comprehensive e-learning support services. For this study I investigate the corresponding participatory planning process. The purpose of the investigation is to unpack some of the inherent complexity of the development and implementation of ICT support for learning and teaching in higher education.

The questions that guided my inquiry are: What expectations arise from various stakeholders in such a complex situation? If we review the field of research in this area, which expectations should have been expected and which came as a surprise? In particular, I will look at the inherent tension of closed learning management systems versus open educational resources.

Thus my response to the “expect the unexpected” theme in community informatics is twofold: (a) at a macro level, I contrast our case with the prevailing research on e-learning strategies and implementations, (b) at a micro level, I look at unexpected turns and alliances in the planning process within the case. The results of the inquiry could inform the design of similar processes of developing and implementing an e-learning strategy.
The structure of the paper is as follows: In the next section, I will elaborate on the main aspects an e-learning strategy has to tackle and summarize relevant research findings. In the section that follows I will present the case study. In particular, I will describe, analyse and reflect on the specific case, assessing the expected and the unexpected in that case. Conclusions will highlight main findings and bring this paper to a close.

**ICT in Higher Education – A design challenge**

Implementing ICT support for learning and teaching can take a variety of forms and can use many different technologies. For a coherent strategy on how a university wants to incorporate the new possibilities brought about by ICT, decisions have to be taken on various levels. Key decisions to take are about the general role ICT should play in the academic setting (*role of ICT*), which tools and technologies should be used (*tools & technologies*) and how open the e-learning system should be designed (*grade of openness*). These three dimensions will be used to summarize important research results up to now.

**Role of ICT**

Brown & Duguid (1996 distinguished two very different roles ICT can take on in higher education: ICT can be used as an efficient means of information transport ("transport paradigm") or as a means to provide students with easier access to scientific learning communities ("community paradigm"). Within the "transport paradigm", knowledge is seen as a discrete entity and learning is about receiving and storing information. Academic teaching then is seen primarily as a delivery service, with ICT a perfect means to enhance logistics. Larger numbers of students and geographically dispersed students can be reached and delivery can be speeded up. Within the "community paradigm", however, learning is conceptualized as the process of enculturation in - academic or professional - communities (cf. Lave & Wenger 1991, Wenger 1998). In this paradigm the role of ICT would be to provide students with better access to existing communities or to provide them with the means to establish communities themselves.

The decision about what role ICT should play in education is deeply interrelated with the question of educational designs. Within the transport paradigm, there seems to be no need to create innovative educational designs. For example the question of how to store and deliver videotaped lectures was the centre of the discussion. Within the “community paradigm”, there is the need to develop new educational designs - designs that enhance the quality of learning and teaching (e.g. Arnold et al 2004). Thus, some research work on educational designs has explored what sorts of designs are most conducive to producing and nurturing online communities (e.g., Paloff & Pratt 1999, Bielecky & Collins 1999, Precece 2000, Arnold &Smith 2003, Arnold, Smith & Trayner 2006).

Mostly, e-learning in these studies has been regarded as product innovation. After a pioneering phase, the issue of sustainability gained importance. Many projects had no long-lasting effect. After their funding stopped, they could hardly be retrieved (Haug &Wedekind 2009). It became evident that strategic approaches were needed to ensure sustainability (Uhl 2003, Euler & Seufert 2004). “E-learning strategies” began to be developed in which universities defined the goals and general purpose of ICT support for learning and teaching (for examples of e-learning strategies of German universities cf. Kleimann & Wannemacher 2005). With this insight, e-learning was no longer regarded exclusively as a product innovation but as well as process innovation.

Furthermore, the implementation process within an organization was conceptualized as a change management process (Behrendt 2004, Reinmann-Rothmeier 2003). As with any change process, resistance to change had to be expected. Among academic staff four different types of lecturers were identified: (a) pioneering lecturers – intrinsically motivated, eager to experiment, (b) careful lecturers: intrinsically motivated, using tested tools and designs, (c)
incentive-oriented lecturers: extrinsically motivated by incentives, (d) resistant lecturers: resisting any change due to conviction or lack of knowledge (cf. Pfeffer, Sindler & Kopp 2005, 47pp.)

**Tools and Technologies**

ICT support for learning and teaching brought about specialized software, integrating and bundling the most commonly used tools such as discussion forums, data repositories, assessment drop boxes and administrative functions. Such learning management systems (LMS) are nowadays available in abundance. A first step to implement e-learning consists of selecting a LMS. Commercial software competes with open source software such as Moodle\(^2\). Comparative studies can facilitate this selection process (e.g. Schulmeister 2003, Baumgartner, Häfele & Maier-Häfele 2002).

With the widespread availability of web 2.0 technologies including wikis, weblogs and social networking tools the situation has become even more complex. There are a growing number of choices for creating “digital habitats” for learning communities (Wenger, White & Smith 2009, Schaffert & Ebner 2010). Web 2.0 technologies are usually easy to use, freely available and also suited to support informal learning settings.

Another set of tools allows easy digitizing of videotaped lectures – streaming software. These tools make it possible to broadcast live lectures to remote locations or to capture lectures for later revision by students. Thus, streaming technologies can provide students with flexible study formats while also reaching a wider audience, e.g. students with a disability or who are otherwise incapable of following lectures on campus. With the advent of podcasts, larger collections of such educational resources, especially for higher education, came into existence (cf. podcampus\(^3\) or iTunesUniversity\(^4\)). However, the disadvantage of streaming technologies is that they privilege the transport paradigm over attention to educational design (Burnett & Meadmore 2002).

In summary, we are faced with a proliferation of tools and technologies to use in education. Even when a learning community has established a set of tools already there is always the temptation to introduce a new tool to ease tasks or enhance learning. Often this “one more tool” process is technology driven and too little attention is paid to the intricate social processes around such an introduction of a new tool (cf. Arnold, Smith & Trayner 2010)

**Diverse Grades of Openness**

Introducing ICT into higher education, a university can realize diverse grades of openness: Should educational resources that are developed within the organization be accessible to other people outside the university boundaries: potential students, alumni or just anybody interested? Should educational resources for e-learning, which often have high production costs, be solely developed and produced by one organisation or should a network of

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\(^2\) Cf. [http://moodle.org/](http://moodle.org/)

\(^3\) Cf. [http://www.podcampus.de/](http://www.podcampus.de/)

universities try to leverage synergy effects by pooling resources? Thus, the issue of “open educational resources” enters the scene. Up to now there is no widely agreed upon definition of the precise meaning of “open educational resources”. The term was coined in UNESCO’s activities to enhance higher education in developing countries, referring to “the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes” (OLCOS 2007, 21). The powerful idea behind open educational resources is that “the world’s knowledge is a public good and that technology […] provide[s] an extraordinary opportunity for everyone to share, use, and re-use knowledge” (OLCOS 2007, 16).

A pragmatic, widespread definition specifies “open educational resources” as “digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research” (Hylen 2006, 1) There are various interpretations for “open” and respectively “free”. Generally, these terms are understood as creating as few barriers as possible in accessing the learning material in terms of costs, technology and property rights (OLCOS 2007)

Most well-known open educational resource initiatives in higher education are MIT’s OpenCourseware Initiative and the LearningSpace by The Open University, UK. Many other universities and networks of universities followed (for an overview on international initiatives cf. Wiley 2006, MMB 2007). Reasons for making universities establish or join an open educational resource initiative include the conviction of knowledge as a public good, a marketing strategy, a means of quality assurance and faculty development. Generally, in Germany there are few initiatives so far. There seem to be special barriers embedded in German academic culture (cf. Braun 2008). Interestingly, most of the German examples listed in a comprehensive international report (MMB 2007) do not employ the “open educational resources” label themselves. Often they stem from networks of universities who share the production and development costs and want to enrich their study programs (e.g. Bavarian Virtual University, cf. Rühl 2010).

Open educational resource initiatives are faced with a great number of challenges: it is difficult to devise sustainable business models and retrieval systems, implement license systems and use technologies that all partners or all potential users agree upon. Another challenge, often forgotten, is the challenge to provide adequate educational designs, especially taking into account the “open audience”: “If the goal is innovation, access alone is not enough” (OLCOS 2007, 31).

ICT in Higher Education II – A Case Study

In this section I will describe and reflect on one particular case: the participatory planning process of an e-learning strategy and implementation system that I co-ordinated for my university. I will first delineate the context for this case and describe the methodology used. For the case description and reflection as such I will use the three dimensions role of ICT, tools & technologies and diverse grades of openness elaborated in the section above.

Case Setting & Methodology

Munich University of Applied Sciences is the biggest university of applied sciences in Bavaria and the second biggest in Germany, with more than 14 500 students. Supporting nearly 500 academic staff members in 14 faculties, the university offers more than 60 study programs in a wide range of technical, social and economical domains. ICT support for learning and teaching varies across faculties. There are some pioneering e-learning projects that use a variety of tools and technologies in diverse educational settings. Tuition is mostly face-to-face, sometimes supplemented by learning resources and discussions online within a learning management system or by a videotaped lecture for later revision. Up until now no e-learning strategy or set of comprehensive goals and guidelines has been defined. A project to
develop an e-learning strategy and recommendations for how the strategy could be implemented started in March 2010 and will run until February 2011. I was assigned to be the project co-ordinator. Requirement from university management was that Moodle should become the key learning management software. An agreed upon milestone, due by end of July 2010, was a draft e-learning strategy for the university and a draft design for support services in order to implement the strategy. The second half of the project was designed to discuss and refine the draft versions within the diverse university bodies. The aim is to publish an officially endorsed e-learning strategy by March 2011 and to set up the infrastructure for corresponding support services by the same date.

To ensure broad participation and to include a maximum of perspectives several measures were taken: First, the project outline and objectives were presented and discussed in the relevant academic bodies. Second, all stakeholders (representatives from all faculties, university management, ICT centre, library services, administration) were invited to a full-day kickoff workshop. At the kick-off workshop a task force was established and assigned to draft the strategy and the support services. All workshop members could discuss intermediate results of the task force in an online consultation phase.

While the project is still underway, the first milestone has been completed. Drafts of a strategy and of the design for support services are produced and are awaiting discussion and refinement in the academic bodies. For this investigation, I will reflect on the processes leading up to the first milestone. My research method lies between action research and autoethnography (cf. Ellis 2004) as elaborated and explained in more detail in Arnold, Smith, and Trayner (2006 and 2007). The central element of this research approach is an encompassing reflection of one’s own practice grounding it in process data.

The data used for the investigation consists of extensive project notes, minutes of meetings, participant observatory notes as well as projects artefacts such as workshop results, online consultation commentaries and the final drafts. Additionally, I will draw on survey data collected by a colleague within a related project (Döhl 2010a) and user statistics from the learning management system.

**Role of ICT**

What expectations were raised by the different stakeholders for the role of ICT for learning and teaching?

One key cluster of expectations circled around enhancing the *quality of learning and teaching*: From a student’s point of view, ICT-support for learning meant primarily to study at a modern, state-of-the art educational institution, to intensify communication with lectures, to acquire media competence as a relevant job qualification as well as to gain greater ease of study organisation (digital learning resources, all in one place, integrated with library services such as e-books etc.).

For lecturers, ICT for teaching preferably could relieve the face-to-face sessions from tedious exercise phases or repetition periods through automated exercises, quizzes or alike. Furthermore, e-learning resources could guide students in their preparation and recapitulation of lectures; they could help to establish learning communities amongst lecturers and students and student work could become a learning resource for all (instead of just being delivered to the lecturer for grading). Furthermore, lecturers expected ICT to augment the
internationalisation of their teaching. With learning management systems or conference systems at hand, it would become possible to invite online guest experts or to have virtual international meetings. Another expectation was to make it easier to provide students with authentic and up-to-date learning material and to offer greater choice and selection in resources by linking to resources on the net in addition to one’s own course material. In addition, e-learning was also considered as a means to document student workload as requested by the new Bologna regulations. For university management ICT promised to constitute a competitive advantage: for the image value of ICT for modern education, for the aspired rise in quality of learning and teaching as well for a better integration of all university services (administration, library services, teaching, research).

Another key cluster of expectations revolved around flexibility: First and foremost, students hoped to gain greater flexibility as regards time and place to study. Lecturers also appreciated an increase of flexibility for their teaching obligations. University management expected to be able to reach new, non traditional student cohorts: Study programs could now be designed for students who work alongside their studies, who have care obligations or a disability that prevents them from following lectures on site. Nowadays certificate programs for professional development need an e-learning component to accommodate the diverse working time patterns of professionals studying.

Yet another bundle of expectations dealt with innovation: Pioneering lecturers hoped for realizing innovative educational designs with ICTs, for example using e-portfolios as an alternative means as assessment. Using animations, videos and simulations promised new potentials for teaching. Another dimension of innovation was related to creating an open educational space (this will be elaborated upon in the section “diverse degrees of openness”).

In addition to these positive expectations, many apprehensions and some resistance became visible. In all stakeholder groups (students, lecturers and university management) people were concerned whether the university could change into a distance education institution. In addition, lecturers were worried that using ICT for teaching could create an additional workload for them without any compensation. Reformulated as positive expectations, all stakeholders expected a clear commitment to face-to face tuition with e-learning exclusively supplementing regular face-to-face seminars and lectures. Furthermore, for those exploring new educational designs with ICT and developing new multimedia learning resources there should be a compensation scheme in place. Such a scheme could also serve as an incentive system to attract staff other than pioneers. Most important, comprehensive support services seemed to be needed to reduce lecturers’ workload.

Assessing the Expected and the Unexpected

It comes as no surprise that expectations concerning the role of ICT for learning and teaching were manifold and also contained apprehensions, even resistance. It proves the point that the introduction of e-learning is a complex change process that needs participatory planning structures. Furthermore, ascribing a rise in quality, flexibility and innovation in ICT-support was to be expected as these themes dominate the discourse on e-learning in the expert community. Unexpected, if anything at all, was the strong “mingling” of aspects of the community and transport paradigms. The perceptions of the role of ICT support could not

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5 The Bologna reform that lead to bachelor and master degrees in higher education in Europe requests universities to document students’ workload and self-study times.
easily be sorted into the “community paradigm” or “transport paradigm”. The distinction is helpful to describe principle differences and to generate a standard for evaluating the introduction of ICTs. In the case study ICT for supporting communities as well as for enabling flexible study formats could hardly be separated and both aspects were subsumed under augmenting quality. It seems that flexible access to learning resources has become a general quality criterion in higher education.

Striking for me, but not entirely unanticipated, was the apparently inseparable bond between the role of ICT and highly specific software tools. Even in the initial phase of creating a vision for e-learning at the university nearly all ideas were directly connected with a specific tool. Abstract affordances that could help shape the selection process for certain tools did not seem to be considered - even after many years of experimenting with technology for learning and teaching.

Tools and Technologies

Regarding tools and technologies, lecturers were concerned about robust performance, reliable helpdesk services and long-term provision of selected systems. Those who had been engaged with the LMS before Moodle expected support in migrating their courses. Generally, there was anxiety that frequently changing systems would require getting familiar with new software over and over again. In addition, lectures feared a rising workload due to insufficient support in creating educational designs with ICT, a lack of expertise in multimedia production, and an explosion of communication channels.

Re-framing these concerns as positive expectations, the resulting cluster was related to sustainability. Hardware and software facilities needed to be laid out for reliability and performance. Software selections, especially the selection of the official university’s LMS, needed to be realized with a long-term perspective. Support services were needed that comprised a help desk for technological problems, migration services from the previous LMS to Moodle, training capacities in handling the LMS and other tools as well as advice and services in multimedia production and creating educational designs with ICT. Whereas the latter service was expected primarily for lecturers, the first ones were required for all users.

The importance of having a range of different tools and technologies was also stressed. One central LMS did not seem sufficient to meet the needs of different faculties. Interestingly, there was never explicit interest expressed in central provision of wikis or weblog software. This was in contrast to the interest in streaming technologies and tools for creating podcasts of lectures and conferencing software such as WebEx. The faculty of business engineering had already successfully explored the affordances of these technologies (cf. Döhl 2010a and b). According to a recent survey, more than 90% of students of this faculty regarded such “lectures on demand” as a useful contribution to their study program. This contrasts with the perception amongst lecturers, 45% of whom regarded “lectures on demand” as not really

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6 In recent years another learning management system, Zepelin, had been used by some technical faculties, resulting from a cooperation project with the Technical University Munich. When the hosting, helpdesk and support by the cooperation partner came to end, management decided to shift to Moodle. Moodle was chosen as a Moodle installation had already been successfully adopted by two non-technical faculties. These faculties promoted Moodle due to the fact that its handling was perceived as easier for people without technical affinity.
useful vs. 52% who advocated the idea or strongly advocated it (Döhl 2010a). For the
advocators, the LMS Moodle was mainly useful for distributing streamed lectures. Moreover,
the faculty of applied social sciences expressed strong interest in supplementing the LMS
Moodle with specialised e-portfolio software, such as Mahara. A research project, concerned
with the refinement of study programs of social work, had indicated the need for fostering
reflection and connecting different subject areas.

Assessing the Expected and the Unexpected

The issue of sustainability, and especially the demand for long-term planning and
sufficient support services, lies in line with the experience of many universities gradually
leaving the e-learning pioneering stage. The fact that there was no explicit demand for central
 provision of web 2.0 technologies despite them being “hyped” in many e-learning
publications could be regarded as surprising at a first glance. On the other hand, it could also
be explained as follows: By definition, web 2.0 technologies are freely available and easy to
handle. Hence, barriers in access or usage are low anyhow regardless of central provision or
not. Additionally, due to their open character, often grading students work with these
technologies is difficult.

An unanticipated turn in the process development was the unexpected alliance between the
faculty group using streaming and conferencing software and those advocating Moodle for the
support of learning communities, including Mahara for e-portfolios: For actors adhering to the
“community paradigm”, like myself, there seemed to be little common ground with the
promoters of “lectures on demand”, an approach that was quickly linked with the “transport
paradigm”. Generally, those interested in enabling community building often discarded the
streaming of lectures as of less educational value. Although there might be still differences in
detail, it became evident in the process that we shared more goals than we had thought before
such as in using ICT in teaching for continuous internationalisation and thus creating broader
learning communities. Especially, as the advocators of the streaming technologies discovered
Moodle not only as a distribution channel but as much as a system for creating communities
around the streamed lectures.

Diverse Grades of Openness

The topic of open educational resources was not discussed explicitly in the overall process.
Implicitly, however, the topic was dealt with at various points. In a certain sense, the decision
for Moodle can be regarded as opting for an open educational resource as Moodle is a free
tool and open source software for organizing online education. On the other hand, learning
resources provided in the courses of Moodle are exclusively accessible for students of one
university, often only for students enrolled in one particular course. The same applies at the
level of lecturers. Usually, lecturers will administer their learning resources individually.
While the sharing of resources is not facilitated by Moodle per se lecturers expressed strong

7 There even exist free hosting facilities for Moodle for those organizations that do not want to their
8 Thibault (2010) describes this phenomenon with “open source, closed doors”. There also exists an
open Moodle course repository but its about 70 courses are marginal in number as opposed to more
than 3 million courses run on Moodle worldwide.
interest to build an e-learning lecturer community at the university for sharing of experience. In such a community, the sharing of learning resources could be one element of the collaborative practice—and could be realized via Moodle.

At another level, the topic of open educational resources turned up in respect to the Bavarian Virtual University (BVU). The university is an active member of a network of Bavarian universities that jointly produce and share online courses. Lecturers who run courses for BVU expected efficient support services to ease administrative barriers when students from other universities needed access to our Moodle installation. Yet another group of lecturers were concerned about blurring boundaries of course content on our Moodle installation and BVU courses due to previous problems and disagreements with BVU as regards rights of use and patent rights.

Generally, it was perceived by all stakeholder groups that ICT support per se opened up university education: the choice of learning resources for students is expanding, the possibilities of collaboration in geographically dispersed groups is rising, and learning communities with permeable boundaries that could include people from outside the university can be fostered.

Assessing the Expected and the Unexpected

The open educational resource debate is highly featured in academic communities concerned with e-learning in higher education. Nevertheless, it comes as no surprise that the topic did not appear explicitly on the agenda. Open educational resources, first and foremost, need functioning communities. In the case I presented such a community did not yet exist.

What I did not anticipate beforehand were the contradictory perceptions of cooperating with BVU. I had expected BVU to be a key driver for implementing e-learning at our university, given that its underlying principle is to leverage synergies by sharing of production cost, administrative overhead and workload. With BVU the rights of use and patent rights are clearly regulated so I would have expected the usual barriers to open educational resource initiatives to be reduced. Re-considering this unexpected scepticism towards BVU the difficulties might stem from this way of “traditional handling” of licences and rights. It would be worth exploring whether alternative copyright and rights of use regulations could improve the situation.

Conclusion

With this paper I set out to investigate the intricate design process for ICT-support for learning and teaching in higher education. In a case study I described a participatory planning process of an e-learning strategy and reflected on the expectations raised in the initial period of the project with a focus on the inherent tension between implementing a closed learning management system and designing for open educational resources.

9 Each student in Bavaria can register with BVU for free and can take courses, regardless of which are the home university or the study program he or she is enrolled. People not enrolled in a Bavarian university can participate in courses for a comparatively low fee (cf. for details cf. www.vhb.org or Rühl 2010).
What are the key results? Generally, the complexity of such a process became clearly visible. In addition “expect the unexpected” seems to be a wise guideline for co-ordinating a project like this. In particular, the two-sides of the LMS Moodle as regards open educational resources could be unpacked: Moodle can potentially be used for creating open educational resources but it does not lend itself easily to this purpose. The second main finding is that the relationship between certain approaches to e-learning entails more complexity than usually anticipated. Streaming technologies for lectures on demand and a learning management system to enable community building among students are not as difficult to combine as it may appear at the beginning.

Further research is needed to fully understand how different sets of copyright regulations interacts with the willingness of faculty to support open education initiatives, in particular whether regulations like Creative Commons can help find sustainable solutions.

References


