BEYOND LEARNING PLATFORMS: INFRASTRUCTURES FOR THE DIGITAL CAMPUS

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Abstract: In many universities, learning platforms have not reached campus-wide adoption: they are not an integral part of universities routines. The paper describes two case studies that show typical problems of different strategies for implementing a campus-wide digital infrastructure for online learning. It tries to identify reasons for the shortcomings of these approaches and outlines four alternative approaches for implementing a digital infrastructure for tomorrow's campus. Although the current discussing is focusing on approaches that are based on reusable learning objects the paper favors a "hybrid" approach that focuses on establishing a campus-wide identity management that provides a base for integrating existing internet tools and applications.

INTRODUCTION

For some years now, universities are exploring learning platforms as an educational tool, e.g. for delivering learning materials over the internet. Some universities report a significant use of learning platforms whereas in most universities these platforms are not used very intensively yet. So far, in most universities they are not an integral part of universities routines: the "virtual" campus has not yet reached "real" academic life. The following paper describes two case studies that show typical problems of different implementation strategies for a campus-wide infrastructure. It tries to identify reasons for the shortcomings of today's approaches to implement learning platforms and outlines crucial success factors for a sustainable implementation of a digital infrastructure for tomorrow's campus.

CASE I: TOP-DOWN IMPLEMENTATION OF A LEARNING PLATFORM

In a recent study, we investigated the use of learning platforms in different universities in Germany (Kerres, Nattland, & Weckmann, 2003). In one case, the implementation of the platform was initiated and propagated by the universities presidency and therefore the decision gained a relative high degree of commitment within the institution. After the platform had been implemented in 2001 about 250 courses have been registered on the platform within 2 years. Most of the courses (around 90%) come from the humanities, psychology, economics and social sciences, whereas almost no courses are registered from the faculties of engineering, medicine and science. More than 5.000 students are enrolled in these courses. These figures have to be related to the total number of around 35.000 students and 8.000 courses per semester that are being taught at that particular university.

In some, very few cases, the platform is being utilized as a tool to organize courses that are held jointly with other universities and have participants from other universities form Germany or abroad. In all other cases, the platform is being used for delivering additional learning materials via the internet as an add-on to traditional face-to-face courses on campus (seminars, lectures etc.). The platform helps to distribute materials of any size very fast and efficiently to an easily scalable body of students. Especially with lectures and courses that are

attended by several hundreds of students, from the point of view of the teachers, the platform is a convenient way to deliver materials to the students.

Students now typically are obliged to register with the platform to enroll in these online courses to obtain the study materials for the lectures. They are to download the materials and print these documents for learning. Earlier, the distribution of these materials implied costs that had to be paid (or shared) by the department or the student. Now, with the learning platform, the students have to pay the costs of online access and printing alone, and the departments can reduce their cost for distributing printed materials.

Furthermore, we could find out that the sophisticated testing tools of the learning platform are not being used at all as an essential ingredient of the course. This observation seems to be typical at least for most of the universities in Germany where multiple-choice tests never gained much acceptance in higher education. Moreover, legal obstacles seem to prevent the use of online testing procedures in many institutions.

Therefore, in most cases the platform is employed as an add-on to courses with a large attendance. The learning platform has not initiated new instructional methods or scenarios for learning. Communication typically still is one-way and the platform primarily is a means to convey information from the teacher to the students. Many tools that are part of the learning platform (e.g. for testing, discussing, collaborating, "virtual classroom") have not been utilized sufficiently. Most often, the learning platform is being used for the delivery of documents. But then, most learning platforms lack advanced features for "document management" and "document sharing".

CASE II: A GROUPWARE SOLUTION SUPPORTED BY IT-SERVICES

In another university, due to the lack of a top down decision for a single learning platform several distinct learning platforms are utilized in different schools and departments. Starting in 2000, the central IT-service unit began to propagate a groupware solution for delivering and sharing documents. The solution[1] essentially is a document management system that is based on the concept of sharing folders with others. When a user invites others to work with the documents in a folder it is shared in the others' folders view. Therefore, due to the structure of this solution, it is not possible to track the number of courses that are running on this tool. After three years of use, more than 1000 students and members of faculty are using the groupware solution, not only for teaching but also for collaborating on papers and for administrative purposes. Compared to around 16.000 students that were enrolled at the university by the end of 2003 the number of students registered in these online courses still is relative small and so, the solution has not reached campus-wide adoption.

From an organizational point of view, the solution implies a very low overhead for administration since basically, users simply invite others to folders with certain rights. As our interviews have verified this does imply that to register large numbers of students with restricted rights in a shared folder is more difficult than in case I. The learning platform allows different ways to register online, e.g. self-registration via password, whereas the groupware solution forces the owner of a folder to invite each participant individually by entering an email-account and a welcome message. Furthermore, the teacher has to be careful to define the rights of the invited students, since generally all invited users have the same rights as the

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[1] [www.bscw.de]()

owner of the folder. Obviously, this is not a solution for large lectures and hence, typically it is applied for smaller seminars where teachers and students utilize the platform to exchange materials and collaborate on papers. For larger lectures, teachers still use other learning platforms that are more suitable in this workflow.

The groupware solution is especially adopted by those teachers that use this technology for other tasks - besides teaching - at their institutes and departments. They, for example, have become used to work with this tool to organize documents for research or administrative purposes. They can easily transfer their knowledge and experience of handling this kind of software to the field of teaching and sharing learning materials with students. Interviews with users from this university show that most often they extend and transfer an existing use of the tool to teaching, but would be reluctant to invest the effort necessary to learn a new platform *just for teaching*.

CONSEQUENCES

When comparing the two approaches in case 1 and case 2, the underlying approaches that are implicitly stamped into each solution differ fundamentally. The "learning platform" is suited mainly for relatively hierarchical conditions where a teacher wants to address large groups of students, whereas the groupware solution offers an environment for a flexible exchange of documents for smaller groups of learners. It is an ideal choice for seminars that rely heavily on various "documents" since it provides sophisticated features for working jointly on and with documents in a less hierarchical fashion. This discussion, however, demonstrates that it becomes questionable whether the one solution will fit the requirements for all departments and all teachers.

In general, a university currently seems to have the following options for a learning solution for the digital campus:
- implementing a single platform for all courses
- implementing a variety of platforms
- developing a flexible multi-layer approach that is based on learning objects and a middleware that can route learning objects to different applications
- a hybrid approach that combines various tools and applications, e.g. with connectors for data bases
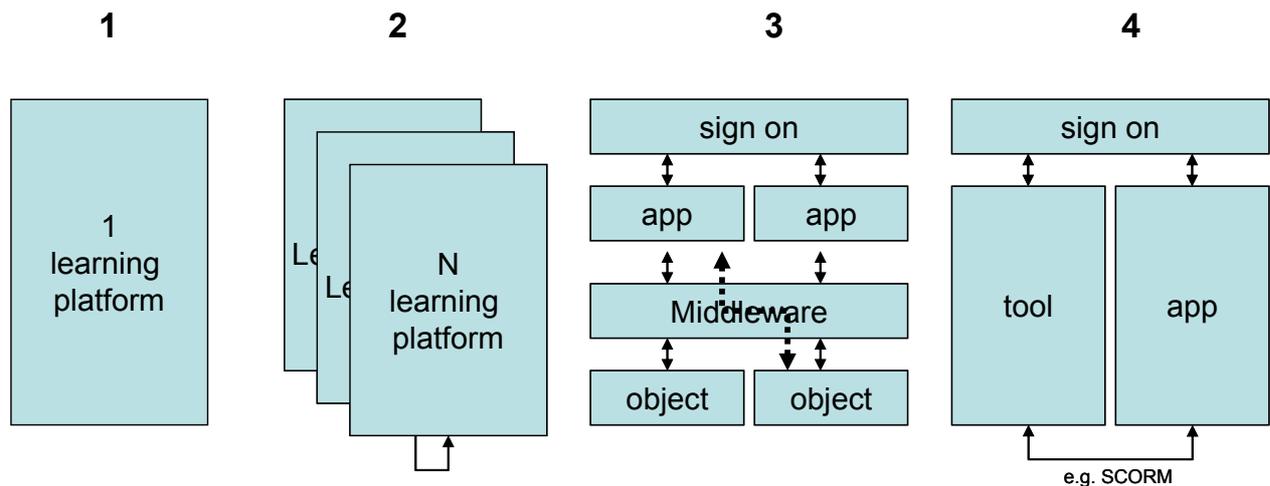
Figure 1: Alternative approaches to building a campus-wide learning infrastructure

The decision for "the one" platform must have the support and backing from universities presidency and even then, in most cases is very difficult to enforce. It seems to be easier if the learning platform is coupled with another information system that must be used for other purposes. For example in one university, a learning management system was introduced that at the same time was introduced for preparing the published catalog of courses. Furthermore, registering a course on this platform became a prerequisite for being accepted as a fulfillment of professors teaching obligations and only courses listed in the platforms directory were able to apply for "real" rooms on campus. With this regime, it was a rather small step towards motivating teachers to use the systems functionality for teaching and learning additionally.

At first glance, under most conditions option 2 appears to be attractive, since no platform alone provides enough functionality and performance that would address all needs in all departments of all faculties in one university. Managing various platforms at the same time, however, is a difficult and time-consuming task for a support unit. Furthermore, students complain that the different platforms they are faced with in different classes and with different teachers are difficult to manage for them, too.

From a technological perspective, the third option would be the most interesting one, because it takes into consideration the current discussion about modularization of learning materials into smaller learning objects (e.g. Wiley, 2002). Learning materials are broken down into chunks of information that can be combined ("re-assembled") for later (re-) use in different learning situations. Although this approach has reached much attention in recent years, it is still under debate, whether for example teachers at universities will accept the radical change in their "production" habits in planning and conducting classes nowadays, that comes along with this approach.

It at all, it will take several years until this approach will be adopted in university contexts. We therefore are currently working on another option, which we find could be a pragmatic alternative for the meantime. In such a "hybrid learning infrastructure", the primary focus is on integrating available tools and applications under one portal without big modifications. A major step towards integration then would consist of establishing a campus-wide single sign-on that enables users to move from one internet-based tool or application to another. As long as tools or applications are able to adhere to certain authentication schemas, it would be pos-

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sible to shift between applications without another login. Since these tools and applications typically also have a user management, we need to write connectors to align the databases of the respective tools. With this, a "real" integration of tools and contents – like in option 3 – is not realized, but for the user a certain feeling of integration can be accomplished. We have implemented such a solution of a hybrid learning environment with "online-campus", that demonstrates the feasibility of this approach for online learning (Kerres & Nattland, 2004). One aspect of our "hybrid" approach is cNews, a personalized information system, that follows the paradigm of "narrowcasting" and delivers news extremely precise to target groups. It cooperates with existing web applications since it can be integrating in any PHP- or ASP-based website. Furthermore, authentication is done via a central LDAP-server, that contains the accounts of all existing users at the university. We want to expand this approach to other applications and tools the university provides in order to reach a campus-wide single sign-on. These activities essentially are based on strategy for establishing a campus-wide identity management, that offers an interface for authentication for all different services on campus.
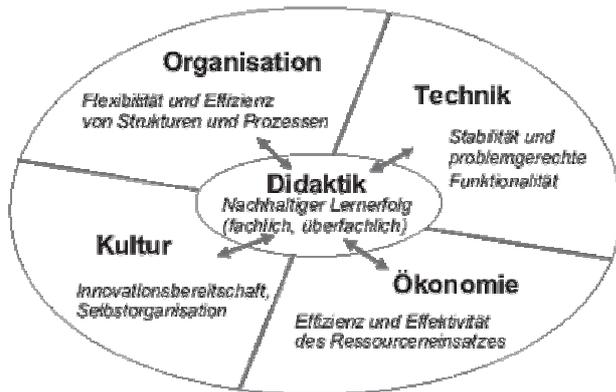
SUSTAINABILITY OF E-LEARNING INNOVATIONS

Current solutions at most universities still are "isolated" – technological as well as organizational. They do not provide a seamless integration of different services, and they are not sufficiently integrated in a campus-wide framework for a digital infrastructure. For some time now, in many institutions committees are discussing the "one best" learning solution. Increasingly, however, the question arises whether in general it is possible to choose the "one best" platform for a university at large or a shift to a wider framework of the digital campus is needed.

Our short comparison points out to the fact that all technological solutions convey a certain structure that is imposed on the interaction of users. In both cases, that were presented, the technology has not reached wide acceptance on campus, although the top-down decision in case I seems to yield a larger adoption from faculty. However, in many cases the use of educational technology does not seem to unleash the technologies' potential to reform learning in higher education.

Most of recent activities in this realm have been organized as "projects" which leads to the question how a campus-wide adoption and sustainable use of new approaches to teaching and learning can be accomplished. Obviously, it is not a question of finding the "one best" solution of a learning platform and furthermore, it is not a question of the backing of the universities presidency alone.

In order to identify the sources that contribute to a sustainable use of e-learning innovations in higher education the Swiss Center for Innovations in Learning (SCIL) from University of St. Gallen initiated a Delphi-study with 60 experts during 2003. Seufert & Euler (2004) found five interrelated clusters that determine the success of implementation of e-learning innovations. Additionally, the Delphi-study identified another important cluster: the development of a strategy that defines the goals for eLearning innovations. Seufert & Euler (2004) emphasize that eLearning must be seen as a mean or a tool to accomplish certain goals in education but – in educational settings – not as a goal in itself. Therefore, the discussion about the educational goals of an eLearning strategy is of high importance to reach a sustainable innovation.

Figure 2: Determinants for implementing sustainable eLearning innovations (from Seufert & Euler, 2004)

The SCIL-framework helps to identify the strengths and weaknesses of current approaches to implement a campus-wide digital infrastructure for learning. Most often, the approaches still are technology-driven, meaning that they are preoccupied with finding a "good" or "the best" technology. The other dimensions that are needed to ensure faculties' recognition very often are neglected.

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