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Blended learning at the macro level – the experience of the Bavarian Virtual University (Virtuelle Hochschule Bayern)

General facts

In Germany, education lies within the exclusive jurisdiction of the 16 states (“Länder”). This was particularly emphasised in respect of higher education by the Federal Constitutional Court in 2005. The Free State of Bavaria, the second largest of the 16 German states, encourages and promotes the use of ICT at all levels of the education system. As part of this policy, a “High Tech Offensive” was launched in 1999. The initial funding (€11 million) of the Virtuelle Hochschule Bayern (VHB) came from this programme.

The VHB was set up in May 2000. Its emergence was the result of the work of promoters of e-learning in the Bavarian universities and of a decision by the Ministry of Higher Education (Bayerisches Staatsministerium für Wissenschaft, Forschung und Kunst) that these efforts should be coordinated in the best possible way. Among the founding universities were all nine state universities and all 17 state universities of applied sciences in Bavaria. A further ten universities in Bavaria outside the jurisdiction of the Bavarian Ministry of Higher Education have also become members, e.g. the University of the Armed Forces (Universität der Bundeswehr) and the Film and Television Academy (Hochschule für Film und Fernsehen) in Munich, the Catholic University in Eichstätt and the protestant Augustana Hochschule in Neuendettelsau. The work of the VHB is regulated by a special ordinance of the Free State of Bavaria.¹

The aim of the VHB is to complement the programmes of the traditional universities, not to replace them. With the help of the VHB, students can earn credit points in individual courses, but they obtain their degrees at their home universities as the VHB does not offer complete courses of study. The activities of the VHB should not be confused with the distance education programmes offered by some of the member universities. These courses of study (generally including face-to-face elements) mainly serve the further education needs of people in employment.

In the academic year 2005/2006, 183 different courses were available. Most courses are offered each term (semester), some courses are offered once a year. In both terms of the academic year 2005/2006 combined, 329 courses in total were held. There were 44,500 enrolments by 15,000 individual students on these 329 courses.

The VHB helps its member universities to provide high quality education for growing numbers of students in times when state funding does not grow proportionally. It helps the students to organise their individual studies in a more flexible way. This is especially valuable for non-traditional students. It also helps students to complete practical courses and trainings as well as studies abroad without extending the dura-

¹ http://www.vhb.org/dokumente/downloads/verordnung_vhb_2005.pdf

tion of their studies. In addition, by studying through VHB-courses students develop e-learning literacy, thus enhancing their employability.

The VHB employs neither academic staff nor tutors. Teaching is offered by professors of member universities who work within the VHB either as part of their workload or in addition to it. For day-to-day course work, professors usually employ tutors. The remuneration of the tutors is subsidised by the VHB. Full-time employees of the VHB are administrative and technical personnel.

Until now, the VHB has been financed almost exclusively from state funds and member universities have contributed indirectly through their infrastructure. From summer 2007, member universities will contribute financially in relation to the number of students they have.

Contextual factors

The degree of digital literacy within the general public in Germany and Bavaria is difficult to assess. According to the latest research², 66% of the German population has access to the internet. For those who have completed secondary education, the figure is 85%. It is assumed that digital literacy in the target group – students – is relatively high. The large majority of students use computers and the internet on a daily basis.

Among university staff, various attitudes towards online teaching can be found. The majority of university teachers do not use online teaching. This does not necessarily mean downright rejection; there is often just a certain diffidence towards technology. This seems to be the case in the Humanities in particular. It is hardly surprising that in Science and in Business Sciences a larger proportion of the staff is active in online teaching. However, it should be emphasised that there has been a noticeable shift in attitude over the past years. Today, fewer professors regard online-teaching as “un-academic” or even as a threat to their position, but the readiness to use e-learning still differs significantly between individual departments and disciplines. At the same time, the euphoria with which some enthusiasts advocated online teaching as a panacea for all the problems of university teaching has vanished.

The VHB focuses on member universities and their students as its “market” for online education. At the moment, the member universities have about 250,000 students. This figure is expected to rise to about 320,000 by 2012.³ Students of the member universities use the VHB courses without paying fees. Students from other universities and persons interested in lifelong learning can also be admitted on payment of a fee.

Universities and students use online technology on a large scale, but traditionally distance education plays a minor role in Germany, compared, for example, to the USA, Canada or the Nordic countries. The network of higher education institutions is quite

² ARD/ZDF-Online-Studie 2006, 06.09.2006, <http://www.daserste.de/service/ardon106.pdf>

³ cf. Wissenschaftsland Bayern 2020 – Empfehlungen einer internationalen Expertenkommission. Munich: im Eigenverlag des Bayerischen Staatsministeriums für Forschung, Wissenschaft und Kunst, 2005

dense in Germany, and the social factors of face-to-face learning play an important role for most students and teachers. It seems likely that a large-scale replacement of face-to-face learning by e-learning would be rather unpopular with the majority in both groups.

On the other hand, the growing number of students in times of strained state budgets necessitates the restructuring of university teaching. This need for change is intensified by the Bologna Process, with its focus on modularisation, and with the increase in the number of examinations required by the new degrees.

In addition, within the framework of the new Bavarian University Law⁴ and with the help of global budgeting, the universities acquire more room for manoeuvre. In this situation, various combinations of web-based and face-to-face learning (“blended learning”) go some way to meeting the current challenges. Within the VHB, blended learning at the macro level plays a key role.

Cost-effectiveness and macro-level blended learning

What do we understand by “blended learning at the macro-level”?

After the initial e-learning euphoria had died down, “blended learning” became the common term for the integration of computer- and web-aided elements into teaching and learning. By “blended learning”, many experts mean the combination of face-to-face teaching and web-based teaching *within a single course*. We call this type of blended learning “*micro-level* blended learning”. While micro-level blended learning has many pedagogical benefits, it does not necessarily make full use of the economic effects of e-learning. Professors who use single e-learning elements in their courses do not necessarily gain additional teaching-time, and micro-level blended learning is hardly a remedy for, e.g., a shortage of lecture rooms, which many universities have to face. For the students, this type of blended learning offers only limited flexibility. In many cases, especially when the e-learning elements concerned are exploited by only one professor at one university, micro-level blended learning seems to offer higher quality or added value only at additional cost.

In contrast, the VHB concentrates on *macro-level* blended learning with the aim of offering high-quality teaching at a lower cost than face-to-face teaching.

We understand macro-level blended learning to be the integration of single online or e-learning courses into courses of study or curricula which otherwise mainly consist of “traditional” face-to-face courses. Thus, students can earn some credits in online-courses, but not a full degree. This combination of face-to-face courses with courses that are delivered *completely* online (with the possible exception of the final examination which has to be held face-to-face) allows the students much more flexibility than micro-level blended learning. At the same time students enjoy all the benefits of traditional face-to-face university teaching. Therefore, macro-level blended learning minimises the dangers of social isolation often associated with e-learning.

⁴ http://www.stmwfk.bayern.de/downloads/hs_hochschulgesetz_hschg_gvb1102006.pdf

Moreover, if online courses are developed once at one university, but exploited at several universities, the comparative cost-effectiveness is obvious. Universities can “import” courses from other universities, even including student support from tutors of the “exporting” university. In contrast to micro-level blended learning, this kind of import also helps universities to compensate for a possible lack of teachers as well as eventual room shortages.

Macro-level blended learning combines the social and pedagogical benefits of face-to-face teaching and learning with the economic effects of e-learning, and it is therefore one of the responses to the challenge of growing student numbers in times of strained public budgets. The cost effectiveness of macro-level blended learning, in turn, is the major motivation for the Bavarian Ministry of Higher Education to finance the necessary structures and the development of new content. However, it should be pointed out that neither Ministry nor VHB see macro-level blended learning as a means of reducing the overall cost of education. On the contrary, investment in education will have to be increased considerably, and face-to-face teaching and learning will continue to be dominant in higher education. Macro-level blended learning is a means of limiting the *additional* costs of better education for more students.

To achieve the goal of cost-effectiveness, courses must be developed to meet the demand of the universities. To develop new courses exclusively according to the pedagogical and other preferences of individual professors would not ensure the amount of student enrolment necessary for a noticeable contribution to the total teaching load of the Bavarian universities. This in turn would seriously challenge the use of the VHB for both the state and its member universities, that is, for the institutions on which the funding of the VHB depends.

Technical issues

As the VHB can draw upon the cumulative ICT competence of its member universities, the central service unit employs few technical staff of its own.

In the VHB with its more than 30 member universities, a variety of learning and content management systems (LCMS) is in use. This variety is a consequence of the variety of subjects taught as much as of the history of the VHB, which in the year 2000 started with 36 courses prepared by different universities for different subjects. No central server is used; all courses are on the servers of member universities, and they are administered by the persons responsible, i.e. by professors of the member universities or by members of their staff. It has been argued that this may not be the most effective solution, but as far as can be judged from the students' evaluation, this plurality of LCMS and platforms does not constitute a problem for the students. Critical remarks by students related to specific features of specific systems (which were then improved), not to the fact that a variety of systems is used. Besides, the transfer of the existing courses to a single system would not be economically sound. The gradual introduction of a central LCMS was discussed at a conference of the member universities in December 2006, but the vast majority was not in favour of such a solution.

While unification of LMS or CMS does not seem to be an urgent issue, the establishment of an authorisation and authentication infrastructure (AAI) is on the agenda. As a first step, a system of data exchange has been established with all important member universities that makes direct online-registration with the VHB possible. Data on participation in examinations and on their results is a sensitive issue. These data are exchanged directly between the examining university and the students, and between the students and their home universities, not via the VHB.

It is necessary for all course developers to ensure that students equipped with ordinary (not high-end) hard- and software can use the VHB's courses. The interpretation of what can be regarded as "ordinary" may vary between the disciplines, e.g. most students of engineering will have at their disposal software which may be unknown to most students of law.

For the course catalogue and for registration, a central system ("FlexNow!", developed by the ihb-institute of Bamberg university) is in use. The second generation of this system is in preparation and is scheduled to replace the existing version by the end of 2007.

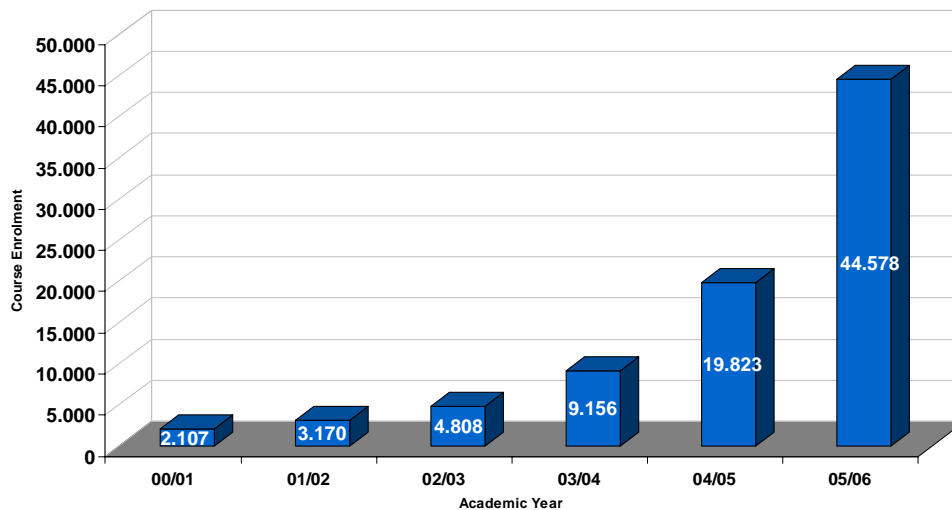
Courses

In the "Wintersemester" 2006/07 (September 2006 to February 2007), the VHB offered courses in the following fields of study (the number of courses is given in brackets):

- Business Sciences (24)
- Computer Science (17)
- Engineering (25)
- Health (27)
- Key Qualifications (26)
- Law (20)
- Social Work (12)
- Teacher Training (16)

The relative importance of these fields of study (measured in terms of student enrolment) has varied over the years. In its first three years, the VHB offered courses in Business Sciences, Computer Science, Engineering, Health and Key Qualifications.

Initially, the highest demand was for courses in Key Qualifications and Health. Later, the demand for courses in Business Sciences rose significantly. In the academic year 2005/06, Law courses were most popular. The new groups of Social Work and Teacher Training have not yet fully developed their potential. The following graph shows the overall development of student enrolment:



The question of the “onlineability” of different subjects has occasionally been raised. Within the VHB, successful online courses have been developed for various subjects and with different pedagogical concepts. Of course, some subjects appear to be especially suitable for online treatment (as opposed to traditional paper-based distance education) because of the additional *pedagogical* benefits which electronic communication and multimedia elements provide. On the other hand, the *economic* benefits of offering courses online instead of paper-based or face-to-face solutions can be just as significant and important. The decision to develop and offer an online course should be based on pedagogical as well as economic considerations.

As far as course schedules are concerned, the question of flexible start-up and progression to, or synchronisation with, face-to-face courses at the member universities has been decided individually for each course, depending largely on the requirements of the given discipline. Courses in Health and Law generally have flexible start-up and progression. This is possible due largely to the regulations of the traditional “Staatsexamen” (state examination) where the system of credit points does not apply. In most other subjects, students have to earn their credits by passing a face-to-face oral or written examination at the end of each course. These examinations are offered once each semester, and this in turn influences the flexibility of the start-up and the progression.

Moreover, for many courses where intensive individual tutorial guidance is required, it would be too costly to employ tutors throughout the year, and professors are not generally available for teaching purposes outside the normal teaching periods.

As synchronous communication places severe limits on flexible start-up and progression, teaching and learning on most of the VHB’s courses is based on asynchronous forms of communication.

The courses of the VHB are developed at individual universities; there is no central production unit. Generally, within the universities (or within their institutes which provide online education) there is a clear division of labour. Content is usually provided by professors, who then employ skilled staff for the transformation of that content into an online course. In some cases (mostly at universities of applied sciences), professors also take part in the technical implementation.

The workload of university professors is defined by state regulation. University professors have to teach nine academic hours a week, professors at the universities of applied sciences have to teach 19 hours. By regulation, up to 25% of this workload may consist of online teaching. It is within the competence of the individual university to decide whether online teaching is actually credited to the workload of the individual professor. In practice, there are many cases where professors conduct online courses in addition to their workload. State law makes the remuneration of this additional work difficult, but the VHB finances tutors.

Quality management

Evaluation and quality assurance play central roles in the VHB's overall concept. Before it is accepted by the VHB, every new course is evaluated by experts from Bavarian and other universities. The students evaluate their courses every semester. On average, 15% - 20% of students take part in these surveys. Any problems pertaining to tuition can usually be solved by contact between the VHB Office and the individual teacher. If the maintenance of quality requires additional investment in either content or software, the VHB provides the necessary funding, provided that the course is still in sufficient demand. Moreover, every course is evaluated again by experts from outside Bavaria after five semesters, i.e. 30 months.

For all evaluations by experts, a standard evaluation sheet⁵ is employed. This elaborate and effective quality management has contributed significantly to the success of the VHB. Pedagogical research on e-learning is conducted by individual professors on the basis of their courses. In 2005, the VHB was evaluated by an international group of experts.

Furthermore, the VHB supports competence development by financing courses for online-tutors. The courses are organized by Munich University's Institute of Pedagogy. All tutors working on VHB-courses are encouraged to take part in these courses.

Organisational structure

At the outset, the VHB's structure was modelled on the German *Gremienuniversität*, which comprises a variety of assemblies, boards and committees. Over the years it transpired that this model constricted the ability to act quickly and effectively, an ability which is pivotal in the world of online-teaching and learning.

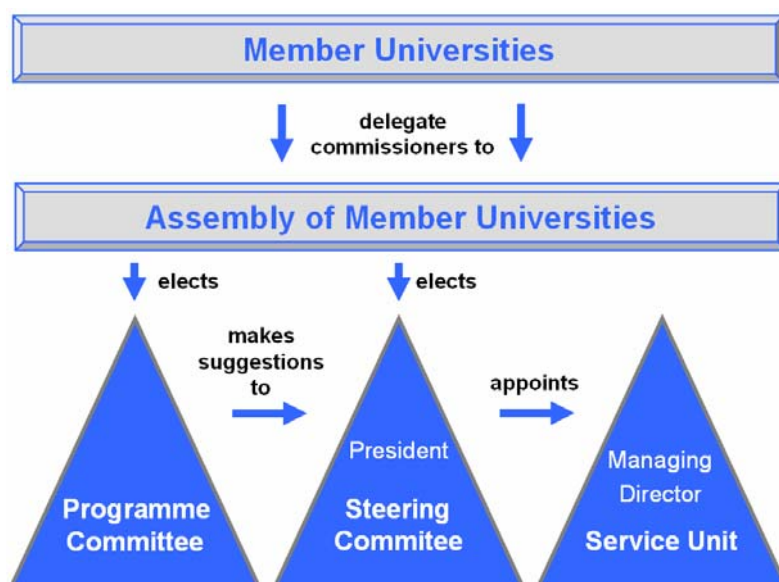
Since the end of 2005 a new organisational structure applies. The main body of the VHB is now the Assembly of Member Universities, in which each member university is represented by a commissioner, who in turn is the key person for all VHB affairs within her or his home university. The commissioners are usually members of the governing body of their university. The Assembly elects the Steering Committee and the Programme Committee.

⁵ The evaluation sheet can be downloaded from http://www.vhb.org/dokumente/downloads/vhb-QS-Kriterienkatalog_Englisch.pdf.

The Steering Committee consists of three members. Both the President and the two Vice-Presidents are presidents or rectors of member universities and in this function represent the VHB in the Conference of the Rectors and Presidents of the Bavarian Universities and the Conference of the Presidents and Rectors of the Universities of Applied Sciences. The Programme Committee consists of eight members, five of whom must be Vice-Presidents responsible for the areas of teaching and studying at their respective universities.

While all offices mentioned so far are held by professors as part of or (mostly) in addition to their ordinary workload, the Managing Director and the employees of the Office work full-time for the VHB. In the Office, 16 employees work in the areas of finance, project management, public relations, student registration and technical support.

The following diagram gives an overview of the organisational structure as it is today:



Once again: economy

Up to now, no universally accepted method or standard exists to measure the cost-effectiveness of higher education. What is the output of education? To what extent should the large costs of the universities' infrastructure be taken into account, how should these costs be attributed to teaching and to research?

What can be undertaken (with some limitations) is a comparison of online and face-to-face education. As far as university teaching is concerned, online teaching can be more cost-effective than face-to-face teaching, at least if it is organised on a level larger than the individual university. If universities use online courses provided by other universities, they can use some of their teaching capacities for subjects which help them to shape their specific profiles. Also, they can provide their students with teaching on subjects not covered by their own staff. Professors can, to some degree, concentrate more on subjects they prefer to teach face-to-face.

A prerequisite for the economic soundness of this approach is strict orientation to the demand of the universities, i.e. a new course is funded only if a sufficient number of universities are willing to replace part of their face-to-face teaching with this course. To meet this demand, the member universities are encouraged to form groups for those individual courses for which there is a demand, and to apply for the funding of these courses. Corresponding to the means at its disposal, the VHB then chooses which courses to finance and offer.

The VHB has succeeded in cutting down production costs for online courses by about 60% per unit since 2000. This is partly due to the general influence of the learning curve, partly to a more realistic view of the use of multimedia effects: some cost-intensive multimedia elements have proven to be “nice to have”, but not “need to have”.

The VHB is financed by the state and by its member universities. The state budget is passed biannually by the state parliament. This mode of funding provides a stable and predictable financial basis for the operation of online education for the main target group, i.e. students of the member universities. Income from other sources (individual users and licensing by other institutions or companies) plays a minor role.

The structure of the VHB permits a maximum of flexible employment. As stated above, the VHB does not employ teaching personnel. At the level of professors or lecturers, teaching is performed by personnel of the member universities. Tutors for the courses are employed by the individual universities on the basis of contracts for work and labour. Thus, no new permanent jobs have to be created. This facilitates quick adaptation to change, e.g. in the possible case of a future decrease in the number of students due to demographic development. This policy also minimises possible hardships, because tutorial work is attractive mainly to senior and post-graduate students and is not intended to provide long-term or permanent employment.

Conclusions

The VHB has achieved the position of mega provider of online education within the framework of public higher education and intends to enhance this position by serving the needs of four target groups: students, professors, universities and the state.

Students profit from the flexibility of online teaching. Flexibility is especially important for “non-traditional” students. Therefore, the VHB concentrates on asynchronous forms of communication.

Students of the member universities do not have to pay fees, and they should have no additional costs when using our courses.

The quality of our courses is assured by a three-step system which makes the quality of online teaching much more reliable than the quality of face-to-face teaching.

The possibility of developing e-learning literacy while studying a subject which is part of the curriculum, enhances the employability of the students without requiring additional effort.

Professors experience a wider range of pedagogical possibilities. Many of them also appreciate the possibility of reaching more students with their teaching. Where online teaching is accepted as part of the professors' workload, they also profit from the flexibility online teaching permits.

By offering teaching on standard subjects online with tutors, professors can concentrate on face-to-face teaching of more advanced or specialised subjects. This can be both more demanding and more satisfactory for the teacher.

Working within the VHB network is also attractive for professors because of the grants with which the VHB funds the development of online courses and their improvement and because of the financing of tutors.

Hopefully, the involvement of professors in the work of the VHB will be taken into account in the new remuneration system for professors which is gradually being introduced.

Universities profit from the VHB in several ways:

By setting up the VHB as a common institution and by using its courses jointly, universities considerably enhance their teaching capacities. Not only can they offer additional subjects, they can also release teaching capacities which may be used for other purposes, e.g. for teaching subjects less suitable for online teaching.

Generally, universities are facing a time of greater competition. But this does not exclude cooperation. On the contrary, in order to survive in a world of growing competition, universities will have to cooperate not only in research, but also in teaching. The VHB is an excellent means of establishing and developing such cooperation.

One of the most important aspects of this cooperation is the establishing of common quality standards for online teaching.

From the point of view of the **state**, the situation can be characterised by the following considerations:

1. Public budgets will continue to be strained, because debts and deficits must be reduced.
2. The number of students will rise considerably, at least until 2012. Later, demographical factors indicate a gradual decline. On the other hand, Germany needs to boost the proportion of her population with university-level education, and wants to attract more students from abroad. This could also mean growing numbers of students after 2012.
3. As far as we can see, higher education will continue to be basically state funded. The fees introduced from 2007, with a maximum of €1,000 p.a. per student, will not fundamentally change this situation.

4. Therefore, additional high-quality education must be provided in a cost-effective way. The development, with public money, of similar online courses in different universities would be economically unwise (and would probably be criticised by the Bavarian Court of Audit).
5. Online education which is financed, organised and exploited at a level that encompasses all universities within the responsibility of the Bavarian Ministry of Higher education, appears to be an appropriate and necessary response to these challenges. (Of course, it cannot be the only response).

To achieve its present position, the VHB had to concentrate on the following key factors, and it will carry forward this policy in order to continue its successful development:

- continuous improvement of courses and of administrative processes in order to reach maximum user-friendliness
- strict orientation to the demand of the member universities
- cost-effectiveness
- priority given to quality, not quantity
- close cooperation with universities and the ministry
- drawing upon the competence in the member universities, using their infrastructure as much as possible
- transparency in all decisions, especially in funding
- lean organisation, simple structures
- flexibility with regard to the development of the course programme, to the development of personnel and to the use of teaching and learning software