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Christoph Revermann

eLearning in research, teaching and further education in Germany

Summary

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SUMMARY

Over the past few years eLearning has developed continually in Germany's universities and colleges of higher education, and everyday student life in any subject area is hard to imagine without learning and teaching using modern ICT media. The Federal Ministry of Education and Research (BMBF) provided more than 230 million Euros support for well over 100 projects between 2000 and 2004. The funding was initially channelled primarily into the development of eLearning content.

Initial experience from the development programmes as well as empirical investigations show clearly that eLearning has to be understood as a part of a university development process and that a necessary change to the university in the digital age is taking place. The successor programme »E-Learning for Science« should therefore help the universities to consolidate from 2005 to 2007 what they have thus far achieved, and to support them in setting up a sustainable infrastructure and suitable general conditions.

Why eLearning

The understanding of eLearning has changed continually over the years. The original highly technologically characterized definition is currently being rediscussed and modified in connection with the integration of more comprehensive didactic concepts. This continual process of change requires various forms of eLearning to be taken into account; there is no one single concept of eLearning.

In this report eLearning is applied to all forms of teaching and learning which are supported or made possible by new ICT technologies, and which serve the recording, storage, handling and processing, application and presentation of information or learning content. The layout of the digital content can be interactive and multimedia, i.e. texts, graphics, audio and video sequences, animations and interactive functionalities can be used. The learning processes can be complemented by net-based communication between the learner, tutor, lecturer or fellow learner – e.g. through email, chat rooms and collaborative working environments.

The benefits for the learners or added value can be seen in the flexible, time and location-independent use; in the greater motivation to learn through new learning scenarios and communicative, interactive support; in the opportunities for simulating real situations; in diverse and collaborative design options as well as



in the opportunity to be able to use or make available additional information or knowledge building blocks . Additional test components make a continual and immediate learning review possible. In particular with the completely digital forms of learning, these potential advantages are faced with drawbacks which can arise through the absence of teachers and fellow learners.

After the technological dimension of eLearning had long been the centre of attention, the importance of didactics has begun to grow in the meantime with the design of learning content and the development of competencies. Successful eLearning assumes a capability and readiness for self-learning. It is not only the lecturers who have to attune and prepare themselves for new virtual forms of learning. There are also demands made on the university managements and persons responsible for further education. Online-based forms of learning in particular present the culture and the organisation of the university with a fundamentally new situation, requiring changes in internal procedures and processes. In order to introduce and implement such learning forms, an education management system is required which is able to permanently analyse the scale of the changes and professionally intervene where necessary.

ACTIVITIES AND REGULATORY FRAMEWORK FOR THE IMPLEMENTATION OF ELEARNING IN GERMAN UNIVERSITIES

A fundamental prerequisite for the effective use of eLearning in the university sector is its organisational implementation. eLearning should be treated in principle as an organisation development process, where research, teaching and learning are closely co-ordinated. eLearning – in whatever concrete form it takes – can only then be successful, if the result is the systematic and professional application of IT in the university and in teaching, pervading the content and organisation of all areas.

In order to fulfil the structural, organisational and content requirements and necessities mentioned, numerous initiatives were established on a broad basis in Germany from the end of the 1990s. Extensive support measures from the federal government, the regional governments and also the universities themselves have since pressed ahead with the development and implementation of eLearning in research, teaching and further education. Various comprehensive programmes and guiding projects of different sizes and with different goals, which however have a common interest in promoting eLearning at universities, have strongly characterised eLearning activities in Germany. Public individual support focuses on the one hand on projects related to the technological infrastructure and on

framework conditions, on the other hand on projects leading to the development of more training oriented teaching/educational software.

National development programmes

The »New Media in Education« (NME) development programme stands out on a national level. This programme is extensively funded by the BMBF and has 100 integrated projects alone with central sponsorship (project executing organisation: »New Media in Education + Subject Information«), however attention should also be paid to other initiatives which often have as many as 30 projects. The »Notebook University« programme, which has dedicated itself intensively to the implementation of mobile computers as well as the integration of communication technologies and capabilities in courses for teachers and students, and less to the development of concrete eLearning products, has on the other hand done rather more to create the framework conditions for the use of eLearning at universities. Special activities – such as the guiding projects sponsored by the federal government – are constructs with a small number of partners, which distinguish themselves through their cooperation structure and their variety of courses (e.g. with an eye on the private sector or the international market) in much the same way as they do through their efforts to (also) develop courses of studies focussing on (training and) further education. In the area of distance learning the Bund-Länder Commission for Educational Planning and Research Promotion (BLK) also promotes eLearning courses of study.

In the foreground as regards content are most notably eLearning products in the areas of computer science, media sciences, mathematics, natural sciences, economic and social sciences as well as engineering. Courses in law, humanities and cultural sciences, on sport, teacher training and key qualifications are represented on a much smaller scale. Products are often created right at the interfaces between a faculty and ICT technologies.

The sustainable exploitation of the projects, i.e. the implementation and use of their results in the university as well as the preparation and execution of activities for marketing and sales, has indeed been postulated many times in the development programmes, this has however only been partially observable to date. Even though the establishment of a network is consistently being striven after, at times an impression of »art for art's sake« is created with regard to the development of eLearning. It is mainly individual university players, who take pains to ensure the continuation of their projects, their sustainable use and who attempt new forms of exploitation. Indeed depending upon the development programme there are measures and concepts for the evaluation, quality assurance and con-



tinuity of the courses integrated into the project execution; however with the »New Media in Education« programme in particular, it became apparent during the project that in spite of the precise development criteria it was the sustainability of the developments in the universities that attracted least attention.

The development funds have run out for most of the projects (development phase from 2000-2004). As thereby the financial resources required for completing projects, personnel, further technical development, licences etc. were lacking in some quarters; and partially due to an absence of their own sustainable concepts and precautionary measures on the part of the universities; or for want of support from the university management; the integration of courses into the standard programme and the improvement in their continuity, where applicable also the fact that sales and marketing were not and are not (adequately) prepared; a premature termination of several projects or the disappearance of certain didactic courses has been recorded since 2004/2005. In laying off competent project-related personnel, the universities have partly lost practical knowledge, wide-ranging expertise on the development of eLearning and thereby future development potential. This prospect is not particularly welcome news when one considers that Germany is only 17th in the »eLearning Readiness Rankings (eLRR)«.

Whether the 20 projects of the second phase of the BMBF development programme »New Media in Education for German Universities« for the continuation and dissemination of eLearning courses, which began in 2005, can achieve the necessary sustainable implementation of comprehensive eLearning structures by the end of the decade and make a leap forward on the international »eLRR« scale remains to be seen. The targeted new orientation of the development of organisational infrastructure, qualification and incentive models for teachers, as well as horizontal dissemination through cross-university authorities, is however surely a sensible strategic approach.

Regional government projects and university activities

On a federal state level, the spectrum of different promotion activities and structures, ranging from individual initiatives to large networks, is very broad. Also the commitment on the part of state ministries, to busy themselves with media development and specifically to design development programmes which enhance the use of multimedia, as well as the permanence and sustainability of such efforts vary considerably. At Universities, Colleges of Higher Education, and other types of colleges as well as in distance learning and further education centres, it is also apparent which strategies are being followed nationwide. These manifest

themselves in various forms and with different results, be it in regard to the integration of new media in teaching, research and further education; be it in relation to organisations or establishments such as multimedia or competence centres, through co-operation, key technical aspects, consultation, sales, marketing and more. The »Virtual Universities« or »Campus« were initially established on the initiative of the regional governments or competent ministries. These usually tend to be central education portals and development programmes and support other people's developments, rather than manufacturing autonomous products or marketing these themselves. That is to say, they attempt to bring the accumulated evolution of eLearning courses at universities together, grouped according to subject. The »virtual university« serves above all as a communication and coordination platform and bundles decentralised courses and knowledge databases. In the course of this it encompasses as a rule developments and projects for the support of traditional standard students and supports teaching, administration, knowledge management and libraries through Internet applications. Consultation and other services are increasingly offered, new structures for improvements in continuity are built up and long-term strategies are developed here. Support functions, in particular also in view of the improved continuity of courses, are taking over in some quarters from competence or multimedia centres which developed out of different institutional co-operation projects in the university sector.

Alongside the state programmes, universities are pressing ahead with the development of eLearning courses on their own initiative. In some university programmes there are faculties with large numbers of projects; but there are also developments made by individual university players. Overall it can be ascertained, that early, diverse and sustainable implementation of ICT technologies and eLearning are often accompanied by university managements as well as individual teachers, who are themselves very interested in new media in teaching and get involved accordingly. Furthermore the importance of a long-term perspective is increasingly recognised: for example how extensive eLearning at universities can be initiated and established, to what extent further education will have to be seen as the third task of universities and how the value of a commitment to eLearning at the respective institution appears to the teaching staff or what incentives will have to be created here for professors, lecturers and staff in the short to long-term.

In the area of virtual correspondence courses, there are several eLearning courses which part-time students and employed persons can access online and which allow them to learn at their workplace or at home. There are still few complete, exclusively computer-assisted courses of study to be found in Germany; in this



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respect there are to date primarily virtual further education or post-graduate courses of study. Institutions which concern themselves exclusively with the development and application of eLearning products are still few and far between.

If you try to summarise the developments in the individual federal states, you soon reach the limits of possible or meaningful analysis and interpretation because the framework conditions laid out by the regional governments are difficult to compare. The establishment of different forms of organisation and the implementation of concepts for teaching, research and further education vary(-ied) considerably. Not only were there partly separate efforts made by universities and colleges of higher education within a state; but there were attempts made either in individual projects or nationally and transnationally to set up international cooperation and projects as well.

Due to the lack of an overview and the absence of co-ordination, various developments, such as learning platforms, have been created again and again or at least in very similar forms over the past few years. Synergies here would not only have promoted the developments, but would have also made funds available for further products or sustainable implementation. In particular with regard to the commercial market, where parallel to this there has also been a (further) development of, for example, learning platforms which are also used at many universities, such a development can be questioned critically.

The federal states and respectively the universities are only gradually beginning to concern themselves more with questions such as that relating to the media competence of university teachers and students, the acceptance and actual use of eLearning (e.g. through appropriate validation terms for virtually achieved accomplishments), from incentive structures to a greater implementation and further development of eLearning as well as the acknowledgement of accomplishments through teaching credits or the awarding of prizes (e.g. »best eTeaching«).

GERMANY IN INTERNATIONAL COMPARISON

In view of Germany's international marketing of education – by which initiatives in the different education sectors are carried out for the most part independently of eLearning activities – as well as various efforts made by the EU, but also an internationally increasing interconnectedness –, it is of increasing importance to recognise the market potentials as well as the development strategies of other nations and to learn from the experience in the use of eLearning there, to be

able to profit from the development of competencies or also the achievement of innovation potentials.

The Economist Intelligence Unit in cooperation with IBM tried to determine in 2003 where 60 individual states currently stand with regard to the development and implementation of eLearning in the categories of education, industry, government and society. The states which head the ELR rankings distinguish themselves through several similarities: a highly developed ICT infrastructure, education systems, which rely on very early educational support and the integration of eLearning instruments with respect to this, intensive education marketing and a learning culture, which encompasses governments, society and the economy, i.e. the public and the private sector often work closely together here, there are numerous joint projects and intensive cooperation between companies, associations, government agencies and also educational institutions themselves. The most powerful nations in the global economy, the USA, Japan and Germany occupy positions 3, 23 and 17 in the ELR rankings, thus indicating that economic power alone does not obviously seem to be a decisive factor in the implementation of eLearning.

The northern European countries however can be found in the top nine places. Mobile communication opportunities and broadband connections there support the advanced development in northern Europe alongside cultural tendencies, a generally greater interest in ICT, the education systems and government initiatives. Similarly in comparable studies into educational standards such as PISA, Finland and Sweden (as well as Great Britain, Switzerland, the USA and Australia) generally compared favourably, while Germany ranked nearer the OECD average. Canada and the USA are placed 2nd and 3rd in the eLearning rankings. A well-developed Internet culture and a certain tradition of lifelong learning probably play a part here. In particular the integration of eLearning is also well advanced in the tertiary sector. The »virtual university market« is correspondingly strong in the USA, but so is the school sector and the large number of private eLearning providers reflects the intensive use of ICT. Many highly ranked countries also distinguish themselves solely through excellent conditions in regard to the ICT infrastructures. Even among the German-speaking countries in Europe, Germany is not particularly well placed at 17th overall: In spite of its low ranking in the industry category (16th) and thanks to various public activities, Switzerland at 10th is ranked clearly before Austria at 15th.

In the education sector there are also numerous measures in Germany for implementing ICT and eLearning, which however began much later than in the other countries, appeared less goal-directed and target group oriented and are above



all relatively poorly networked. Germany's federal structure with an education system which varies between the federal states and very strongly differentiates yet again within individual states is not however the only obstacle to strategies oriented towards coherency, efficiency and effectiveness. The general difficulty with the integration and support of those discriminated against, from children and young people from low-income families or with migratory backgrounds into the education system, the problem of long drawn-out reform efforts in the education sector – in the clear contrast e.g. with Finland, England, the USA – also have adverse effects on the development and implementation of eLearning.

What is noticeable in studies on eLearning in the education sector is also the lack – on an international scale – of overall coordination and the low level of interconnectedness among the various public and private eLearning actors in Germany. Compared to the USA for example, the more reserved German approach to »Giving and Volunteering« might well also play a role in the education sector. This commitment should not be underestimated in educative and social work. Moreover the execution of numerous individual projects and »isolated applications« in the individual education sectors, in the individual states and municipalities, each crowned with different levels of success, and the lack of a complex, cross-sector and – where appropriate – transnational overall strategy, obstructs the sustainable and effective implementation of eLearning activities. The differentiated administrative structures in Germany are furthermore manifestly preventing comprehensive eGovernment, so that here also Germany does not rank very highly internationally.

International orientation in Germany as a whole should also be included. Whereas Australia, the USA, Finland and England appear to collect stimuli throughout the world and specifically target foreign markets (in particular Australia), Germany is gradually beginning to take steps in the international education market within the framework of initiatives (iMove, High Potentials): However eLearning also remains to a large extent on the sidelines here. Nearly all of the developments in virtual teaching, which were treated for a long time in the universities more as research objects rather than as training courses and where applicable marketable products, are in German. The result of this is that international distribution is difficult for the universities themselves, and in addition it is large firms, operating internationally and with eLearning often already implemented in their human resources development, who prefer in part to draw on foreign content. High costs for the first few years, flops with pilot schemes, difficulties in implementation such as acceptance problems and the like occurred and occur in all countries, however the insights collected there have been evidently better used, solution processes sought and successfully proceeded with.

A positive assessment in Germany can surely be made of the activities initiated in the meantime at all levels of education, in the economy – with the participation of politics and society – as well as the diversity of initiatives, the commitment of individuals and nationwide programmes. There has been state and private investment in infrastructure, in the development and implementation of eLearning and things have been advanced. In the course of this however a framework and a jointly coordinated approach would have been useful. Improvements were necessary and a strategy should have been taken as a basis, which would for example also build the foundations for eGovernment, include initiatives such as »Internet for everyone« and »Overcoming the digital divide« as well as including a general and a vocational approach from the primary through to the tertiary sector. The synergy effects which can be brought about by cooperation with the private sector also ought to have been used and in each case thought through and handled internationally.

What must be done?

The promotion of eLearning in the past few years had to a certain extent deep, but as a rule not yet sufficiently wide-ranging effects. It is true that in individual cases excellence was created and exemplary work implemented, however for the breadth of German university life too little has been achieved. Many development projects have been discontinued, and new strategies are required if eLearning developments are to be maintained or even remain constant and be continued. Due to the time limitations attached to the development projects and the associated brain drain at universities; the existing university structures, which are partially in the process of being reorganised; but also due to the dynamic of eLearning, the consolidation of eLearning at universities and sustainability is however not always given.

Sustainable implementation

As public education and at the same time research institutions, universities are lacking in efficient needs-oriented production and market conditions, from time to time lacking also the necessary mental approach as well as adequate project management. The acceptance and use of computer or net-supported teaching is not yet very high among teaching staff; even students are still partially hesitant. Without appropriate strategies, which are effective in the short to medium term and which do not only implement eLearning at universities and integrate it into the standard programme, but also ensure its sustainability, eLearning would remain a foreign body. The core target must be the long-term use of developments, their adoption both inside and outside the universities, as well as a



solid financial base for the application, maintenance and further development of eLearning. This would include measures for strategic orientation as well as such for technology, didactics and curricular integration. In addition public relations and marketing, digital rights management and quality assurance are not to be neglected. This also means that not only the universities with their projects, and in particular the university managements, but rather also ministries, companies, other institutions as well as financing and development fund providers should participate in the safeguarding of sustainability.

The fact that the sustainable implementation of eLearning at all levels is of immense importance has in the meantime been recognised by a large number of persons responsible in politics and university managements. If you consider the current development, it is also clear in the meantime, that at the moment multiple support facilities are being set up, whether as a position at a facility (research group, university computer centre, media centre), as a network comprising (new and) existing facilities, as a completely new central facility, as a purely university internally oriented institution, as a facility of a state-wide network or as a connection for the corresponding services to an existing communication and media centre. The greater part of the development measures newly initiated since 2005 by the federal and regional governments can also be found here.

Further education and marketing potentials

The majority of eLearning developments are still directed towards research and teaching, i.e. towards the support and supplementation of classroom lecturing at universities. Further education is a field of work that has not so far received as much attention, although this education sector offers opportunities for revenues, profile building, cooperation and more. Even the further education centres do not have many eLearning products yet on offer and often appear cautious in response to inquiries and with regard to the expansion of this range. The fees, which are usually charged for further education courses as well as courses of study fluctuate considerably. The present and future financing of some developments remains occasionally uncertain. However in the foreseeable future an increase in demand (particular in the further education sector) is expected for high quality, needs-oriented content development. Appropriate business models are currently being discussed or designed in many universities; several state portals and support facilities are already applying themselves to corresponding sales and marketing concepts and measures. However the development of a supplementary open concept for universities nationwide could also be advantageous. Even the marketing, which still poses a problem for many universities and facilities could be designed and implemented efficiently with such a facility. The

fundamental requirement for all efforts in this field, i.e. the range of university learning courses offered in education markets, is however the target group orientation and need-based preparation of the products.

Profiling, and where applicable market segmentation and positioning in the market still appear, as in other discussions, to be difficult for universities here, even though in the meantime there are various individual actors, university managements and complete support facilities, who also look after these strategic aspects in addition to their administrative and organisational tasks. Marketing and sales structures are only seldom found in a workable form, which however may be attributed to the fact that further education in itself does (did) not carry much weight at universities. However, of great relevance for further development is the orientation towards real quality further education at the very least. This further education should reflect the competence of the public universities, at the same time as meeting the needs of the target groups and making admission attractive and easy for them. The universities often follow different strategies with their measures in this connection. What they have in common however, apart from the improvement in the technical infrastructure and the development of initial learning content and tools in many places, is the set up of longer-term structures and organisational forms to support eLearning.

Use of eLearning in everyday student life

According to a study of the university information system in 2004, 90% of students in Germany had their own internet access, 54% of them using a broadband connection. However the majority of them (83%) merely used course accompanying materials, whereas only 23% also visited interactive courses. Students preferred a »moderate« use of IT in teaching; only a quarter wished for more intensive IT utilisation. When interpreting these figures the question remains as to whether three quarters of students prefer online accompanying materials because these also represent the greater part of the courses offered, and virtualised courses tend to be the exception, or whether – if courses were offered accordingly – the proportion of those who prefer pure eLearning courses wouldn't be considerably higher.

Seen as a whole however, little seems currently to indicate that comprehensive (»pure eLearning«) will establish itself in our universities in the next five to ten years. Doubtless people will fall back on virtual learning formats and complete online courses in further education and correspondence courses. However in principle it is likely pragmatic motives such as convenience and not the didactic opportunities and advantages, which will be given as reasons for the utilisation



of eLearning. Supply and demand of online courses, with which the necessary credits for an academic career can be earned, are also increasing rapidly in the USA for example, but an accompanying increase in learning and teaching quality is not readily discernible.

But what will the reality of electronic learning and teaching in everyday student life look like in future? At any rate the universities should not only look on passively while eLearning and the Internet diffuse further on the campus. On the contrary they have to actively create this process. In doing so, they need to orientate themselves around two premises: around the wishes, expectations, abilities and behaviour of the students as well as around the current challenges facing universities, which could be outlined with keywords such as Bologna, education market, globalisation and information society. Both together should lead to appropriate strategies. eLearning at universities is by no means a »surefire success«, but rather has to be made possible through innovative concepts – which need to be combined with considerable continual efforts. This assumes a pragmatically oriented new approach: From »best practice« to »good enough practice«, from innovative from a research point of view to useful from an everyday point of view, from a supply to a demand orientation, from eLearning to a service-oriented E-Campus. What will be decisive for the success of a systematic and professional application of IT in the university and in teaching – as the central service sector of every university – will be less the IT systems used and rather the ideas, the people and the strategies behind them.

EUROPEAN KNOWLEDGE-BASED SOCIETY – POTENTIALS OF ELEARNING

A comprehensive implementation of eLearning has in particular to orient itself according to the concrete question: »Where does the application of eLearning bring real added value when compared to traditional methods and content of learning and teaching?«. The additional value can for example consist of new content or in higher learning efficiency. Alongside the formats and content of teaching, the didactic demands on the learners will also change. The motto here could be: »from teaching to learning«. In the USA the discussion on the subject of eLearning, conducted under the heading of »learning without limits«, is more pointed than in Europe. The application of eLearning is viewed as very desirable, because specific barriers will be able to be pushed out further or overcome. Spatial factors lose their meaning with eLearning, as the technology allows a networking of people, which would simply not be possible with classroom teaching. Universities could develop new target groups with eLearning courses.

These aspects also represent essential building blocks of the European education offensive connected with the Bologna Reforms in the context of lifelong learning; the opportunities and modalities provided by eLearning have an outstanding role to play here. In any case similarities between the goals of the reform process and the potentials of eLearning have been established. Bologna should for example promote the mobility of students, which is precisely one of the major promises of eLearning. And today it is – at least theoretically – possible to access digital courses of study from anywhere in the world. Modularisation and transparency are also keywords which can be found in the Bologna catalogue of criteria and which characterise eLearning. The self-study required by Bologna is immanent in eLearning anyway.

Not least, Bologna forces the universities to have a good look at their overall organisation. The structural reform that was begun in the last few years here can be a motor for eLearning and open possibilities for promoting the use of New Media in universities. There are quite a few successful examples in the meantime, although they do not all allow themselves to be arbitrarily carried over to other universities and courses. An individual adjustment and development strategy is more indispensable for each university so they can offer an attractive and pertinent range of eLearning courses.

In principle the potentials of the Bologna process and of eLearning can strengthen each other. In order to succeed, university managements are yet more substantially required, to also see in eLearning a relevant practical and strategic issue and tool for university development. In this respect the current divide between passivity on the one hand and an ambitious atmosphere of awakening on the other hand is still frequently broad. However this is not least caused by incorrect guiding principles being associated with eLearning. Where the real potentials of eLearning lie, requires a constant and much greater critical sighting and reflection, namely both in regard to strategic and conceptual deliberations as well as practical development experience in the light of the many (and varied) concepts for the realisation and implementation of eLearning in universities.

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**BÜRO FÜR TECHNIKFOLGEN-ABSCHÄTZUNG
BEIM DEUTSCHEN BUNDESTAG**

KARLSRUHER INSTITUT FÜR TECHNOLOGIE (KIT)

Neue Schönhauser Straße 10
10178 Berlin

Fon +49 30 28491-0
Fax +49 30 28491-119

buero@tab-beim-bundestag.de
www.tab-beim-bundestag.de