

4 From E-Learning to eBologna in an Augmented Reality The Past and the Future of E-Learning in German Higher Education

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Abstract

The article reconstructs the development of E-Learning in German higher education. It traces E-Learning from the end of the 1990s up to the current perspective of an eBologna, which is defined by an European-wide international mobile learning. In this context digital media are not part of an 'E-Learning' as distinguished from an 'analog learning.' Rather, mobile learning uses the ubiquity of the internet as an additional media dimension through which we can perceive the world and which opens up new learning worlds. The polydirectional and collaborative features of digital media could be used, to establish an European-wide international co-teaching and co-learning in higher education.

Keywords: Web 2.0, Learning management system, E-Learning 2.0, Bologna process, eBologna, Mobile learning, Personal learning environment, Augmented reality, Digitalization strategy, Digitalization of teaching and learning

4.1 Introduction

It is discussed that digitalization possesses an epochal importance (Schwalbe, 2011; Hug, 2012; Heidkamp & Kergel, 2016). Digitalization unfolds its increasing significance within the educational field from the early child education, to the primary school education and to higher education. As academic educational space, universities have to face the challenge of dealing with the requirements and with the potential of digitalization for research, teaching and learning. The challenge of digitalization receives an increasing discursive relevance:

- Funding programmes¹,
- conferences, at which the significance of digitalization within universities is thematized,
- the discussion of best practice examples (how other universities deal with digitalization)² and
- change management processes, which should lead to an appropriate implementation of digitalization within higher education.

These are the part of the everyday reality of people working in the field of higher education E-Learning. With reference to the challenges of an appropriate E-Learning within German higher education in a digital age, it might be helpful to have a meta-perspective on the development of E-Learning in higher education. Such an meta-perspective might help to develop a reflexive position towards the requirements one have to face when using E-Learning strategies. With reference to this aspect, this contribution provides a reconstruction of the last 16 years of E-Learning in German higher education. In the course of this reconstruction

¹ See <https://www.bmbf.de/foerderungen/bekanntmachung-1152.html>. Last accessed: 11 April 2017.

² See example. <https://hochschulforumdigitalisierung.de/de/news/tagung-digitalisierung-der-hochschullehre>. Last accessed: 11 April 2017.

three phases were identified and are described in the following.

4.2 First Phase: First Steps into E-Learning

Although the discussion of the possibilities and limitations of digitally supported learning has a long history (e.g. computer based training), there has been an increase of innovation of higher education learning and teaching with digital media since the end of the 1990s. It is possible to identify two main reasons for this increase of innovation which mainly took place between the end of the 1990s until the mid-2000s:

- The implementation of Learning Management Systems like Moodle, Stud.IP, Ilias or Blackboard and
- Large-scale funding of pilot projects (E-Teaching Funding Projects) which should develop best practice examples and improve the digital infrastructure of universities.

4.2.1 *Learning Management Systems – the ‘Backbone’ of E-Learning in Higher Education*

A first step, to establish a large-scale digital infrastructure for teaching and learning in higher education has been the implementation of so-called Learning Management Systems. Since the mid-90s Learning Management Systems were increasingly implemented at universities. Learning Management Systems are the digital platform/the backbone which enable digital based teaching and learning in higher education. Mostly, Learning Management Systems such as ILIAS or Stud.IP had their origins at universities and are – at least partly – available as Open Source Systems. That means that it is possible/it is intended that people from ‘outside’ of the university contribute to a continuing development of the software. For example, 1999 Moodle was developed at the Curtin University of Technology (Australia). Since 2002 Moodle is free and available as Open Source system. Other Learning Management Systems such as Blackboard are developed and sold by private companies like Blackboard Inc.

With the beginning of the 2000s Learning Management Systems are implemented, so one can raise the thesis that a digital infrastructure for teaching and learning in higher education has been established since that time.

Among other things, Learning Management Systems enable course management. The teacher can provide teaching/learning material and it is possible to implement chatrooms (Baumgartner, Häfele & Maier-Häfele, 2002). Due to the technical progress and emerging innovations of the Digital Age, Learning Management Systems are constantly updated. As an reaction to the so-called mobile internet which led to the fact that the internet is everywhere smartphones are (Kergel, 2014), apps were developed. These apps access Learning Management Systems from mobile devices such as smartphones or tablets.

Despite the diverse functions which are provided by Learning Management Systems and the adjustment of Learning Management Systems to the ongoing media change, there is a critical perspective on them. Since the mid-2000s Learning Management Systems are increasingly labelled as part of an so-called E-Learning 1.0. This E-Learning 1.0 is contrasted with a so-called E-Learning 2.0 (E-Learning 2.0 can be used as term which signifies the second phase of E-Learning in German higher education): According to the criticism, Learning Management Systems reproduce traditional learning worlds and therewith receptive learning within a digital dimension (Ehlers, 2011, p. 65). Learning Management Systems reflect a linear

course structure of sessions – e.g. when they are only used to provide texts which should be discussed at the course-sessions (Ehlers, 2011). The main criticism centers on the fact that the traditional teaching in higher education does not implement the collaborative and polydirectional potential of digital media. According to this criticism, Learning Management Systems do not provide the structure for a participative E-Learning. Thus they are used mostly solely as so-called Content Management Systems (Content Management Systems distribute learning material and enable the administration of courses).

4.2.2 Pilot Projects and External Funding – E-Teaching Funding Projects

While Learning Management Systems constituted a first ‘backbone’ for E-Learning in higher education, the so-called E-Teaching Förderprojekte (E-Teaching Funding Projects) provided best practice examples and pilot projects for digital based learning and teaching in higher education. These projects were initiated at the end of the 1990s/at the beginning of the 2000s and were funded by the state. One can interpret the funding of the pilot projects as an political echo on the increasing meaning of digitalization in German higher education (Arnold et al., 2011, p. 25). The German Federal Ministry for Education and Research (BMBF) provided approx. 300 million Euro for projects which should enhance digital based learning and teaching in higher education (Haug & Wedekind, 2009; Baumgartner, 2003). Diverse pilot projects in different scientific fields were realized. Experts like Arnold et al. (2011) or Haug and Wedekind (2009) problematized the lack of lasting effects of these projects – despite the intense financial funding. In most of the cases, the results of the pilot projects – the developed best practice examples and E-Learning solutions – were not adopted. Haug and Wedekind (2009, p. 34) stressed that the pilot projects mostly suffered from a lack of embedding into the infrastructure of the universities. Mostly the pilot projects were not – or not sufficiently enough – connected to important actors like the IT-services of a university.³

4.2.3 Summary of the First Phase

The first phase established E-Learning in German higher education at the end of the 1990s/at the beginning of the 2000s. Within this process Learning Management Systems and the E-Teaching Funding Projects played a key role. Until today, Learning Management Systems such like Moodle provide the basis for E-Learning at universities.

The critical discussion of Learning Management Systems led to the second phase, in which a participative, more learner-centered E-Learning approach has been developed. This approach uses so-called Web 2.0 tools and their collaborative and polydirectional potential. With reference to this learner-centered shift the second phase is called “E-Learning 2.0 – the digital Shift from Teaching to Learning“ (see 4.3).

The E-Teaching Funding Projects provided best practice examples and the insight that pilot projects need to be embedded into the infrastructure of an university. This insight gained an

³ These mistakes should not be repeated: The current third phase of E-Learning development in German higher education is defined by the insight that universities in the Digital Age need a guided processes of digitalization in which all relevant actors are interconnected. Consequently some universities formulate a so-called digitalization strategy to deal with the challenges of digitalization as well as use digitalization to improve the key areas of universities (namely research, teaching and learning, administration).

increasing relevance within the third phase digitalization of “Third Phase: From E-Learning to the Digitalization of Teaching and Learning in Higher Education” (see 4.4).

4.3 Second Phase: E-Learning 2.0 – the Digital Shift from Teaching to Learning

With their programmatic articles “Connectivism” (2005) and “E-learning 2.0” (2004) Siemens and Downes provided the basis for a new paradigm in E-Learning. This new paradigm, called E-Learning 2.0, is defined by the use of the collaborative and polydirectional possibilities of the Web 2.0 for E-Learning. Web 2.0 tools such as blogs allow users to easily produce content within the world wide web with some clicks and without any programming knowledge. The user turns from a consumer into a producer or fulfills as a prosumer both functions (*cf.* Gaiser, 2008).

The polydirectional and collaborative advantages of the Web 2.0 technology opens spaces for a product- and actionorientated E-Learning – in other words: for an E-Learning 2.0 (Lehr, 2012, p. 47). The new technological possibilities extend the learning spaces of the individual. In contrast to the interaction possibilities of Web 2.0 tools such as wikis and blogs, the ‘traditional’ Learning Management Systems limit the possibilities and the interaction spaces of the learning individual. With reference to Siemens, Ehlers (2011) speaks about Learning Management Systems as a ‘walled garden’. The collaborative possibilities of the Web 2.0 are located beyond the walls of the Learning Management System. E-Learning 2.0 approaches emphasize that E-Learning has to be a situational, self-regulated learning which takes place within the authentic world of the internet and not within separate spaces which are constructed through Learning Management Systems. Instead of Learning Management Systems as central learning platforms, Web 2.0 tools can be used as individual learning platforms. Using such individual learning platforms (e.g. WordPress) the learners can connect with each other and thus initiate socio-collaborative learning processes.⁴

The e-learning application, therefore, begins to look very much like a blogging tool. It represents one node in a web of content, connected to other nodes and content creation services used by other students. It becomes, not an institutional or corporate application, but a personal learning center, where content is reused and remixed according to the student's own needs and interests. It becomes, indeed, not a single application, but a collection of interoperating applications – an environment rather than a system (Downes, 2005, para. 33).

Learning Management Systems – which represent an E-Learning 1.0 – should be substituted by individual learning platforms which enable an individual-reflexive learning within the collaborative contexts of the Web 2.0. Downes concept of individual learning platforms has been modified by Atwell’s (2007) model of Personal Learning Environments. According to Attwell, a Personal Learning Environment embraces “all the different tools we use in our everyday life for learning” (Attwell, 2007, S. 4). In contrast to Learning Management Systems, Personal Learning Environments are like an open system which is detached from educational institutions such as universities and can be used for lifelong learning processes.

Personal Learning Environments can be interpreted as individual learning platforms which are not bound to specific educational institutions. Within an E-Learning 1.0 approach the

⁴ These kind of ‘Connecting’ as process of knowledge construction within the virtual space of the Web 2.0 is a basis premise of Siemens (2005) concept of ‘Connectivism’ which he considers as a ‘learning theory of the digital age’.

learner receives via Learning Management Systems like Moodle learning material. In contrast, E-Learning 2.0 empowers the learner to use digital media for a self-regulated learning within the collaborative context of the Web 2.0.

4.3.1 *Current Perspectives: From E-Learning 2.0 to Mobile Learning in an Augmented Reality*

4.3.1.1 The Ubiquity of the Internet and Mobile Learning

The E-Learning 2.0 approach is extended through the emergence of the so-called mobile internet – the mobile internet accompanies us everywhere via our smartphone. The ubiquity of the internet enables new forms of a situational or ‘mobile learning’. “With mobile learning, the learning phase is not bound to a location with specific characteristics” (Pieri & Diamantini, 2005, p. 184). With reference to the ubiquity of the internet, mobile learning can be defined as a learning which merges E-Learning strategies and presence learning.

4.3.1.2 Mobile Learning in an Augmented Reality

The internet provides a new media dimension, a new way we perceive the world. The Google-Glasses or other augmented reality apps can be used as examples how the internet construct a new media dimension through which we can perceive the world.



Figure 4.1: Augmented-Reality-App ‘Wikitude’ on a Smartphone
(https://de.wikipedia.org/wiki/Erweiterte_Realitat, last accessed: 20 May 2017).

From this point of view it does not seem valid to distinguish a virtual world of E-Learning from a physical world of presence/analog learning. Instead of such a distinction one can speak about a mobile learning in an augmented reality:

[T]he rising interest in new learning spaces such as information commons, where wireless, mobile connectivity admits the full informatic range of the Internet into any niche or conversation. Older spaces take on new pedagogical meaning; for example, wireless cafes allow the full range of classwork to be deployed between a coffee and a bagel. (Bryan, 2004, p. 62)

Contemporary E-Learning dissolves in a mobile learning which is embedded in an augmented reality (see figure 4.1). Established concepts of situational/authentic learning like problem based learning turn into a problem based learning with digital media. From this perspective, E-Learning is not an ‘add on’, but a new media dimension within learning processes.

4.3.2 Summary of the Second Phase

The second phase is defined by a learner-centered approach which uses the polydirectional and collaborative possibilities of the Web 2.0 for an action- and product-orientated E-Learning. This shift from teaching to learning is accompanied by a critical discussion of Learning Management Systems and the development of the concept of Personal Learning Environments. The learner-centered shift from teaching to learning, the plea for an action- and product-orientated E-Learning is an essential feature of this phase. With reference to the ongoing technical process the mobile internet leads to an mobile learning within an augmented reality. E-Learning as a distinct sphere of learning dissolves in teaching and learning strategies which combine established participative methods of teaching and learning in higher education with participative forms of mobile learning in an augmented reality.

4.4 Third Phase: From E-Learning to the Digitalization of Teaching and Learning in Higher Education

The process of digitalization affects not only teaching and learning in higher education. Also the administrative processes are affected: E-Services, the digitalization of administrative services, are a challenge for universities. Libraries need to react on the media changes in their field (Reinhardt, Schmitz & Siebert, 2009) and researchers have to face the digitalization of research-processes which lead to an E-Science (Heidkamp, 2014).

The digitalization of universities can be understood as an ongoing process which affects the university as a whole. The increasing discourse about the need for a digitalization of universities as a whole organizational complex requires to identify a third phase: at conferences, in an increasing number of lectures and within discussions in the press the digitalization of universities receives an increasing discursive relevance. Within the structural digitalization of universities, the focus changes from E-Learning to a Digitalization of Teaching and Learning: In the course of the digitalization process of teaching and learning in higher education it is relevant to distinguish between E-Learning and the 'Digitalization of Teaching and Learning'. The term 'Digitalization of Teaching and Learning' refers to the structural dimension/to the infrastructure which support digital teaching and learning. In contrast to Digitalization of Teaching and Learning, E-Learning signifies the concrete implementation of digital media. Digitalization of Teaching and Learning requires to invent a technical infrastructure as well as didactical counselling for teachers and learners, so that digital-based learning can be realized. E-Learning scenarios in turn can be introduced via best practice examples, workshops and further trainings, in which interested teachers can gain knowledge about concrete implementation strategies. One challenge of the Digitalization of Teaching and Learning is the merging of E-Learning 1.0 approaches with E-Learning 2.0 strategies. Most of the innovative E-Learning 2.0 concepts are realized via external fundings and possess thus only the temporary character of a project. For a lasting effect and implementation of the advantages of E-Learning 2.0 into the infrastructures of universities, it is important to ensure the merge between E-Learning 1.0 and E-Learning 2.0 within the process of Digitalization of Teaching and Learning. Another challenge of the process of Digitalization of Teaching and Learning is to invent or to extend digital study programmes. From this perspective, Digitalization of Teaching and Learning locates E-Learning/mobile Learning in an augmented reality within the infrastructure of an university. The process of Digitalization of Teaching and Learning is part of the digitalization processes which the university is subjected to.

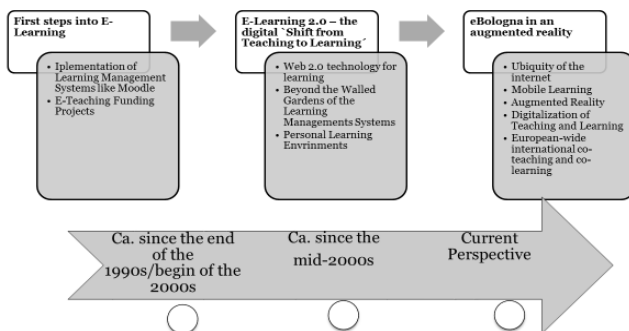


Figure 4.2: Development of E-Learning in German Higher Education (own Figure).

4.5 Outlook – eBologna in an Augmented Reality

With reference to the reconstruction of the development of E-Learning in German higher education, one can observe that there exist parallel tendencies between the unfolding of E-Learning and the unfolding of the so-called Bologna process.

In 1998 the so-called Sorbonne-Declaration had been signed by the education ministers of France, Germany, Great Britain and Italy. The Sorbonne-Declaration formulated the goal to harmonize the architecture of the European higher education system. In 1999, 29 other countries joined the declaration. The initiation phase of the Bologna process had started and took place in a time when the Learning Management Systems were increasingly implemented at universities. Since then the Bologna process and E-Learning had inscribed themselves in German universities. In the course of this lasting change of German universities, an interlinking between E-Learning and the Bologna process emerged: In 2001 the European Association of Distance Teaching Universities (EADTU) discussed possible synergy effects between E-Learning at universities and the Bologna process. The programmatic text "Communication of Madrid about virtual higher education and the Bologna process" states that E-Learning "will contribute to the Bologna aims of mobility, broad access to higher education and competence development in a context of lifelong learning" (EADTU, 2001, para 7).

The interlinking between E-Learning and the Bologna process is symbolic represented in the term 'eBologna'. This term was discussed and coined at the Bologna follow-up conference in 2005 – in times when a Web 2.0-based E-Learning increasingly unfolded. A basic assumption of eBologna can be summarized as follow:

- One central aim and feature of the Bologna process is to harmonize the architecture of the European higher education system.
- Digitally supported learning and teaching enable decentralized learning and teaching processes which are detached from spatial and temporal constraints.
- The merge of both approaches enables a constructive perspective on a virtual European educational space (cf. Handke, 2005, p. 36).

The 'harmonizing perspective' of the Bologna process is extended through the media

dimension of an augmented reality: teaching and learning can take place across the borders of national states. International courses can be realized via co-teaching and co-learning. For this purpose, project based learning or inquiry based learning with digital media could be used. Thus the competence of international project work with digital media can be trained. Such an approach would prepare the students for the requirements and challenges of the labour market in the digital age: participative learning and digital based collaborative work can help to acquire the media competences which are needed in a Digital Age (Reinmann, 2008). From this point of view eBologna – a.o. defined as an international co-teaching and co-learning within the European academic space – would foster the ‘employability’ of the students.

Employability in turn is one of the crucial requirements of the Bologna process and means that the university should ensure that the students obtain the needed qualifications, skills and competences they need to meet the requirements of the modern labour market.

The concept of eBologna corresponds with the requirement that European universities should foster the ‘employability’ of the students. With reference to such an understanding of eBologna, it is possible to locate E-Learning or mobile learning in an augmented reality within the broader context in European higher education.

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