Consolidating eLearning in a Higher Education Institution: An Organisational Issue integrating Didactics, Technology, and People by the Means of an eLearning Strategy

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Structured Abstract

Purpose – Back in the year 2000, the European Council (2000) declared in its Lisbon Agenda that the European Union should become "[…] the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion." This vision encompassed far more than just societal and economic growth in a global world; it also included educational strategies and an e-learning action plan. For example, in 2011, the European Commission mentioned the following as a key policy issue (Communication 2011): to "better exploit the potential of ICTs to enable more effective and personalised learning experiences, teaching and research methods (e.g. [sic] eLearning and blended learning) and increase the use of virtual learning platforms." In accordance with this roadmap, higher education institutions are called on to reflect and re-engineer their educational systems, adapt them to current and future technological and didactical demands and address new generations of teachers and students. New concepts like connectivism (Siemens 2004) and the recognition of non-formal and informal learning (OECD 2016) enhance traditional formal learning settings and lead far beyond the provision of mere learning content management systems. New e-learning and blended learning arrangements like MOOCs (Cormier & Siemens 2010), collaborative learning in the virtual classroom (Tawileh, Bukvova & Schoop 2013) and flipped classroom approaches (Hussey, Fleck & Richmond 2014) are evolving and must be explored, evaluated and then strategically implemented into everyday teaching and learning processes. A comprehensive e-learning strategy should therefore address four fields: didactics, technology, organisation and economy and culture (Seufert & Euler 2004). Besides orientation on the actual trends, the strategy development should also recognise and integrate practical local experiences of early adopters and actors of e-learning in the field. Therefore, a community of knowledge experts in e-learning application has been involved in the strategy development.

Design/methodology/approach – Best practice report of a comprehensive quality initiative for the sustainable improvement of everyday teaching and learning processes at a large university. The challenges of current and future trends in formal and informal learning, collaboration in virtual classrooms and internationalisation of research and teaching processes are analysed and addressed by the strategy implementation plan and a regular evaluation and improvement concept is presented and discussed.

Originality/value – The e-learning strategy presented was developed, discussed and adopted in 2015. Its implementation plan is currently at the final discussion stage, having been due for adoption in January 2016. Practical implications – The e-learning strategy's implementation plan lists targets and sub-targets, underlined by concrete measures, tools and methods, responsible institutions and persons and financial sources. Regular evaluations and improvements will give elearning providers a set of proven instruments to further improve their activities and provide the broad range of students and teachers with a set of best practices to follow, enabling them to discover the benefits of e-learning for their everyday processes.

Keywords – Strategy, higher education, e-learning, dissemination, implementation

Paper type – Practical Paper

1 Background

Back in the year 2000, the European Council (2000) declared in its Lisbon Agenda that the European Union should become "[…] the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion." This vision encompassed far more than just societal and economical growth in a global world. It also included educational strategies and an e-learning action plan. For example, in 2011, the European Commission mentioned the following as a key policy issue (Communication 2011): to "better exploit the potential of ICTs to enable more effective and personalised learning experiences, teaching and research methods (e.g. [sic] eLearning and blended learning) and increase the use of virtual learning platforms."

In accordance with the Bologna Roadmap, in the last decade the German state of Saxony initiated the transition from four to five-year single-track diploma study programmes to the new European standard – bachelor's and master's programmes. This process was accompanied by a state-wide digitisation initiative to improve both productivity and quality in higher education. So, on behalf of the state's Ministry for Science and the Arts, the State Rectors' Conference determined an infrastructure consisting of both a strategy outline for e-learning in Saxony up to 2020 (AK E-Learning 2014), and a standardised learning content management system, which

is currently used by 14 universities in Saxony (OPAL 2016). With regard to this infrastructure, regularly state-wide projects for the development and the roll-out of practical e-learning solutions are announced and funded (Bildungsportal Sachsen 2016).

Embedded into this context, TU Dresden[1] additionally runs the Multimediafonds (Multimedia Fund 2016) programme already since 2005, funding small local initiatives to document and roll out evaluated best practice examples of e-learning from early adopters and researchers in the field of e-learning to a broader audience at the university. During this process, the faculties denominated e-learning deputies. They were asked to develop faculty-oriented e-learning strategies and hand in their faculty's proposals for funding based on these strategies. In 2015, a task force headed by TU Dresden's Vice Rector for Education and International Affairs condensed these de-centralised, bottom-up initiatives and developed the central e-learning strategy for the whole university as usual top-down approach. By this dual perspective, which is based on the fundamental directives of TU Dresden's Institutional Strategy (The Synergetic University 2013), already existing practical expertise should be included into the strategic change process.

2   Theoretical foundations: the planning and realisation of a strategic change process

Within universities, strategies have a clearly defined field of action, which is restricted by a meta-system and organisational policy on the one hand and the tactical methods of the change agents charged with implementation on the other.

Different criteria based on existing data are used for the initial analysis in order to obtain the legitimacy and acceptance vital to implementing the strategy. In accordance with different process and implementation models for the higher education sector (e.g. Keller 1983, Dickeson 2010, Rowley et al. 1997), a range of criteria for developing the e-learning strategy was included. Innovation, demand and quality aspects are decisive in terms of content and viability and resource and cost issues when it comes to implementation. Available skills and staff resources in particular should prove to be a decisive factor in implementation planning. The media centre at TU Dresden is an appropriate centre for digitising learning and teaching, but it was also important to allow all departments, faculties and staff to contribute to achieving objectives. Here, online education is considered to be an organisational development process that links with other stakeholders both within and outside the university (Köhler & Neumann 2011).

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1   Dresden is the capital of Saxony. With more than 36.000 students in 14 Faculties, TU Dresden is one of the largest German Technical Universities and, since 2012, one of the 11 German Universities of Excellence (https://tu-dresden.de/tu-dresden/profil#page-intro-1)

The strategy should be adopted by the entire university, not seen as merely a top-down instrument in the context of developing higher education. This is why departmental and/or faculty experts were dispatched to the work group for the Vice Rector for Education and International Affairs1. The aim was that they would harmonise their practical expertise in integration of e-learning into their every-day teaching and learning processes, and the specific needs of their fields (e.g. mechanical engineering, medicine or business management) with the possibilities offered by digitisation that were presented by the media centre's e-learning experts, in order to ultimately ensure the widespread acceptance and achievement of targets.

Specifically, the following multi-stage model (Dolence 1997) was used during the strategy development:
- Developing key performance indicators
- Assessing the internal environment
- Analysing strengths, weaknesses, opportunities and threats
- Generating and discussing ideas
- Formulating strategies, goals and objectives
- Formulating the implementation plan.

Implementing the digitisation strategy was not wholly determined by the experts involved in the planning or the vice rector. The responsibility was rather divided between a number of parties. On the one hand, the media centre plays a central, advisory role. It supports lecturers, departments, faculties and university administration when it comes to media education, media rights and media technology issues, acting as a hub where information is collected so that it is available to all of the relevant parties. On the other hand, however, all of these parties work independently towards achieving targets in their respective departments, where regular evaluation and feedback provided to the change agents (generally e-learning representatives from the faculty or department) should ensure quality and sustainability. The final evaluation will take place after five years, on the basis of which TU Dresden's digitisation strategy will be updated as necessary.

3   TU Dresden: a case study

3.1   A framework for e-learning usage

In order to develop initial criteria and ideas, comprehensive guiding principles and foundations for e-learning usage at TU Dresden were drafted as a mission statement (for further discussion compare: E-Learning Strategie der TU Dresden 2015):

- TU Dresden aims to develop a new teaching and learning culture, which addresses a meaningful crossover between technical implementation options, didactics and designing the virtual and/or physical teaching and learning environment.
- TU Dresden's diversity – both in terms of its range of disciplines and its students – requires continuous adjustment of the relationship between conventionally and digitally supported teaching concepts in order to offer attractive conditions for students and young scientists in the future.
- In order to improve and ensure the quality and economic viability of digital teaching, TU Dresden is working towards further standardisation in terms of digitally mapped teaching and research processes and methods. The university is committed to a statewide e-learning infrastructure for Saxony and is proactive in developing it further and promoting its widespread usage.
- It is particularly important for TU Dresden to offer students and lecturers alike opportunities for individuality and interaction, while achieving a higher degree of effectiveness in so-called 'mass study' situations.
- The expansion of research into digital teaching in higher education is vital issue for TU Dresden. The results lead to a continuous development of the e-learning strategy and its implementation.

3.2 Fields of action regarding the e-learning strategy and measures to achieve objectives

Based on the principles and fundamental concepts set out for e-learning usage, the objectives of fostering individuality and interaction, supporting teaching processes and expanding and opening up teaching, which are linked to TU Dresden's e-learning strategy, were determined and further refined using sub-objectives (see Figure 1).

These objectives and sub-objectives are set out below, along with the respective measures needed to achieve them. The sub-objectives focus on wide-ranging effectiveness and build on the current situation and TU Dresden's previous actions and structures.

Integrate innovation		
Foster individuality and interaction	Support teaching processes	Expand and open up teaching
Develop structures and ensure sustainability		

Figure 1: The e-learning strategy's long-term objectives

Foster individuality and interaction

In the introductory phase, courses will be offered to an increasing number of students. In this regard, the university is addressing an extremely diverse student population and, as such, measures are required, which give students access to flexible learning environments both in terms of time and location and enable them to acquire and deepen their knowledge and skills both alone and in a group and replay or catch up via different digital learning resources. This is how individual, interactive learning processes can be implemented and academic success can be increased with perspective, even in mass study situations. The following sub-objectives and measures are taken into account in the context of fostering individuality and interaction:

Online-based teaching/learning scenarios: The aim here is to systematically increase the prevalence of digital teaching/learning scenarios in individual faculties in order to offer students the option of individuality through flexible courses and content. In order to meet these requirements, self-learning offerings should be made available to students, strengthening self-managed, informal learning. Furthermore, the integration of webinars into courses should be promoted and a range of taster and bridging courses should be offered to new 1551 students. Meeting these objectives will require the long-term preparation of an elearning infrastructure, support offerings for lecturers and the provision of an appropriate reward system.

Online-based examination types: The aim here is to increase the prevalence of self-assessments and e-examinations in order to make examination processes and practice options more flexible. E-examinations should therefore be structured and have a central infrastructure (i.e. dedicated examination rooms and equipment) to ensure legally sound online assessments. Furthermore, selfassessment options suited to the target group(s) should be made available and developed. In addition to the above mentioned e-learning infrastructure, support offerings and reward system, adaptations of examination rules and processes and the establishment of an e-assessment centre to ensure the quality of the examination processes are essential (e.g. selectivity, validity, reliability and understandability of the test items).

Virtual collaboration, cooperation and communication: The aim here is to support team work and collaborative learning between students and lecturers in the virtual classroom in order to enable interactive learning processes (even for large events). Specifically, lecturers should enable virtual group work and expand the scope of virtual support for students. Achieving this requires the long-term provision of an e-learning infrastructure, support offerings for lecturers and an appropriate reward system.

Technology-based teaching in the real classroom: The aim here is to provide and use suitable technology to enhance traditional teaching in order to foster interactive learning processes (even for large audiences). The regular integration of audience response into teaching and learning activities should be boosted and the technical use of an audience response system ensured. Increasing lecturers' use of audience response requires appropriate incentives and the provision of support offerings, e.g. in the form of training, consultation and information. Furthermore, a central provision of technology and user support are essential.

Support teaching processes

In order to allow a balance between research and teaching, lecturers must be better supported in their delivery of high-quality teaching and economical use of innovative 1552 technology. Both lecturers' educational media competence and students' media skills must be promoted here in order to successfully plan and implement digital teaching and learning scenarios. The aim is to support lecturers in order to effectively prepare excellent teaching (which enables individual, interactive learning). This enables them at the same time to actively research to a sufficient extent and to give their teaching a research focus. The following sub-objectives and measures are taken into account in the context of supporting teaching processes:

Training opportunities and materials: Lecturers and students should be supported with a needs-based offering of training and development, with the aim of developing a new teaching and learning culture in all departments. Specifically, lecturers' educational media competence and media skills should be promoted and special requirements should be considered in training offerings. Furthermore, students' media skills should also be promoted. In order to achieve this, user training and educational media development should be regularly offered to lecturers and further developed, options for individual requirements (e.g. different disciplines demanding different didactics and e-learning support) should be created and also training offerings for students should be developed.

Support and consultation: The aim here is to support lecturers by individual educational media and application-specific consultation and support, in addition to the networking and provision of e-tutors. Furthermore, the dialogue between lecturers in appropriate formats should also be promoted (community building – e.g. E-Teaching Day at TU Dresden 2015). In addition to the adoption of media technology and didactic consultation for lecturers (e-learning support), a standardised training offering for e-tutors should also be established and the development of a community should be promoted.

Reward system: With the Multimedia Fund, TU Dresden has an intra-university incentive for both lecturers and students. The aim here is to increase the usage of e-learning in teaching and therefore promote the development of contemporary, attractive teaching and learning offerings. Continuous provision and development of the Multimedia Fund is required in order to maintain the incentive.

Expand and open up teaching

The trend towards life-long learning means that TU Dresden is opening up its courses to more target groups (e.g. promoting a family-friendly university). Furthermore, location-independent teaching and learning now mean that international students can already access courses online, even before they decide to study at a German university. TU Dresden should meet this challenge with new, digitally supported teaching and learning offerings, which can also integrate current development in the field of open education resources. The following sub-objectives and measures are taken into account in the context of expanding and opening up teaching:

Opening up courses: The aim here is to offer established, flexible, on-the-job, family-friendly and continuing education courses, as well as strong support for new students and interested parties via an appropriate proportion of onlinesupported teaching. Specifically, (massive) open online courses should be established as an element of digital teaching, on-site teaching should be expanded to distance teaching and learning, on-the-job and continuing education courses should be created and tailored offerings for specific target groups should be available in preparation for university admission. In addition to the provision of an e-learning infrastructure and appropriate user support, increased didactic flexibility of existing courses through e-learning elements and central access is required.

Internationalisation: The aim here is to internationalise study programs and teaching. Primary support should be given to teaching across different sites, students' collaboration and international courses should be strengthened through digitisation. Achieving this requires the long-term provision of an e-learning infrastructure, support offerings for lecturers and an appropriate reward system.

Teaching and learning materials as open educational resources (OER): The aim here is to exploit the potential of unrestricted educational resources. The integration of OER in practice and the provision of an open pool for the use and exchange of learning materials are desirable. In order to achieve this, an integration strategy for OER is required first of all, in addition to establishing technical requirements for the open pool of learning resources.

Integrate innovation, develop structures and ensure sustainability

TU Dresden sees collaboration between all parties, including students, in the context of integrated innovation management as a significant task for the future. Innovations should be explored, discussed and integrated into the existing process. In terms of sustainability, it must be ensured that the financing of new processes and methods is viable beyond start-up funding. It must be taken into account that this does not always require the consolidation of resources; resource-saving, more efficient standard operations can also result in sustainability. In accordance with the synergetic university's motto, networking and transparency enable links to be created, which allow the integration of new elements into existing structures. The following sub-objectives and measures are taken into account in the context of integrating innovation, developing structures and ensuring sustainability:

Integrate innovation: The intention here is the integration and communication of e-learning innovations in order to support the development of a new teaching and learning culture. This requires the continuous investigation, testing and evaluation of innovations while establishing a university-wide innovation forum.

Develop structures: The aim here is to develop the digital structures and support processes that foster teaching under the umbrella of a consistent quality management. Specifically, networking structures have to be expanded, communication about and the visibility of e-learning should increase and the standardisation, planning and implementation of the required equipment in classrooms have to be pushed. This requires creating appropriate interfaces between the systems (e.g. student lifecycle and learning management systems), building transparent structures to support communication, creating a reward system for e-learning representatives and providing in-depth training and consultation. To improve teaching quality through e-learning, quality criteria must be defined and digitisation measures integrated into the university's quality management system. In order to achieve a stronger link between virtual and physical teaching and learning environments, didactic criteria must be defined, tested and afterwards integrated into the university's didactic training program.

Ensure sustainability: The intention here is to ensure a sustainable implementation of the e-learning strategy. This includes the long-term availability, regular updates and maintenance of an e-learning infrastructure designed to cover diverse teaching needs, consolidating services and centralising infrastructures. In order to ensure sustainability, a comprehensive sustainability concept must be developed and continuously checked, adapted and further developed. This also applies to the bottom-up e-learning strategies of the faculties. Finally, the long-term sustainability of an e-learning infrastructure should be ensured, along with appropriate consultation and service.

4 Conclusions

This paper presented the e-learning strategy of TU Dresden, one of Germany's largest Technical Universities and, since 2012, one of the 11 German Universities of Excellence. Its implementation plan follows the fundamental directives of TU Dresden's Institutional Strategy (The Synergetic University 2013) and combines two perspectives: (1) decentralised bottom-up strategies by the faculties and their e-learning actors and (2) central top-down approach by a task force headed by TU Dresden's Vice Rector for Education and International Affairs. Against the backdrop of the challenges of current societal and educational policies, and taking into account the vast diversity of its subjects, TU Dresden's e-learning strategy addresses three main objectives: (1) Foster individuality and interaction, (2) support teaching processes and (3) Expand and open up teaching. These objectives are framed by integrative innovation management and sustainable, multi-step expansion, which takes into account existing structures and (financial) limitations, exploits synergetic usage of new resources and opens up free spaces through standardisation and more efficient organisational and technical processes.

Considering the combination of different stakeholders in a bottom-up and a top-down approach, this conscious strategic process differs from what can be found in literature on the typical (sometimes even unintentional) development of e-learning in German universities (Köhler, Neumann & Saupe, 2010). The active participation of e-learning experts from different fields of TU Dresden, a strategy process taking into regard already existing, competing de-centralised strategies focusing upon faculties' specialities and cultural contexts, the local university's reward system, and the recognition of the value of e-learning as an integral, strategic part both in the internationalisation and in the quality management roadmap of TU Dresden are very encouraging. This gives hope that the developed strategy will provide a long-term orientation and framework for diverse initiatives to sustainably change and improve the teaching and learning processes.

Thus, the development process can be seen as an intentional knowledge management approach, fostering communication between and collaboration of diverse e-learning experts and institutions at TU Dresden. Due to the early stage of the initiative, the proof of the long-term success of the strategy depends on its fast official implementation and communication by the University Management and its acceptance by the majority of currently often still observant teachers and tutors.

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