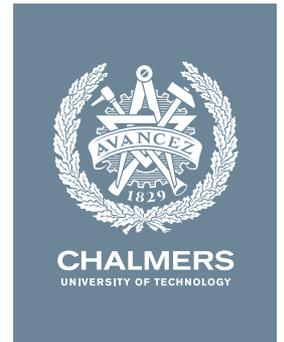


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LEARNING DESIGN AND THE TENSION BETWEEN STRATEGY AND DIDACTICS

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ABSTRACT

Enhancing courses with technology in a manner that supports students' learning, has clear underlying pedagogical values, and is aligned with a university strategy for course development is far from trivial. This paper describes and evaluates a Learning Design approach to such a process — a process that was initiated by a university's strategic goal of providing more and better use of technology for education. At the heart of the process is the Learning Design educational development methodology. The paper discusses the tensions between the goals of the process: learning activities supporting students' learning and the university's overall strategic goal regarding technology. We find that although tensions exist, they do not hinder the design of better teaching using technology, and we conclude that Learning Design is a useful methodology to address these tensions.

KEYWORDS

Learning Design, strategic goals, educational development, technology-enhanced learning, Standards 10

INTRODUCTION

Over recent decades, we have witnessed growing societal interest in the education system. According to Hargreaves (2003), this is linked to the idea of a knowledge society, which considers knowledge a fundamental resource for growth, development, welfare, and sustainability. This has led to increased participation rates in higher education (HE) and enhanced diversity in the student population, which challenges both the purpose of HE and its modes of delivery (Tang & Biggs, 2011, p. 3). Over the last 30–40 years, universities have changed from institutions for a small elite to institutions where a large percentage of a given youth cohort is educated (Hayhoe, Li, Lin, & Zha, 2011; Hussey & Smith, 2010). Therefore, university foci are broadening, and education is gaining a more central role in university responsibilities.

Furthermore, there is an increased focus on quality in teaching and learning. Quality assurance initiatives have taken various forms across different education systems (Alexander, 2000; Hopmann, 2007; Jongbloed, Enders, & Salerno, 2008; Labaree, 2012; Ozga, Dahler-Larsen, Segerholm, & Simola, 2011; Tang & Biggs, 2011). Academics are faced with unprecedented requirements in relation to documenting the quality of their teaching and justifying their didactic decisions. Another consequence of transcending local differences is an increased demand for teacher educator professionalism (Shulman, 1999; Trigwell, Martin, Benjamin, & Prosser, 2000). University teaching has become a 'scholarly enterprise,' formed by a scholarly approach not only to the disciplines but also to the profession of teaching (Boyer, 1990, p. 23). In a Danish context, political awareness of quality in HE can be seen in the new official job structure that has just passed in the Danish parliament (Retsinformation, 2020). It has been declared that all university faculty must teach, each faculty member must create a teaching portfolio, and there must be a competency development plan for each faculty member focusing on his/her teaching. This was based, among other things, on an extensive 2018 report addressing the cost and benefits of HE, as well as on a catalogue of 37 initiatives to raise the return on investment when improving the quality of teaching (Ministry of Research and Education, 2018).

One of the initiatives in the catalogue is an extended focus on using learning technology. This has led to universities having a strategic focus on educational technology. Most universities in Denmark have formulated a strategy for digitalisation that includes the use of digital learning. At Aarhus University, this came into play in 2015, when the university implemented a learning management system where all courses had a digital presence. In the newest contract with the ministry, one of the seven strategic goals is to "increase student learning outcomes," where one of the three indicators is the number of redesigned courses¹ with better and more substantial use of educational technology. This means that educational technology is singled out as a strategic goal and as a didactic means to enhance learning.

From the perspective of educational development, this raises the questions of whether and how this double understanding of educational technology is perceived and conceptualised by the academic staff, how it influences their approach to didactic redesign, and what educational development methodology is suitable to support this process.

RELATED WORK

In the CDIO framework, faculty teaching competences are addressed in standard 10: *A CDIO program provides support for faculty to improve their competence in integrated learning experiences (Standard 7), active and experiential learning (Standard 8), and assessing student learning (Standard 11). The nature and scope of faculty development practices will vary with programs and institutions. Examples of actions that enhance faculty competence include support for faculty participation in university and external faculty development programs, forums for sharing ideas and best practices, and emphasis in performance reviews and hiring on effective teaching methods.* (Worldwide CDIO Initiative, 2020).

The critical reader of this standard could argue that it lacks a focus on educators as designers of teaching activities; the main focus is on the actual teaching, not the planning of it. This could be the reason why we have only been able to find one article from previous CDIO proceedings

¹ In the Danish context, a course is one subject/module (e.g., Calculus 1). Courses are in study programmes (e.g., Bachelor of Science in Maths).

describing the use of Learning Design as a tool for developing courses. In their article, Kozanitis et al. (2009) very briefly describe the use of Learning Design at Singapore Polytechnic.

LOCAL CONTEXT

Aarhus University is the second-largest university in Denmark. It was founded in 1937 and currently has five faculties: Arts, Health, Business and Social Sciences (BSS), Natural Sciences (NAT), and Technical Sciences (TECH). Prior to 2020, the university had only four faculties; NAT and TECH were one faculty called Science and Technology (ST). As this article was written just after the split of ST into two faculties, we still use the term Science and Technology.

All universities are state-financed in Denmark. The funding generally consists of two sources: money for research and money for education. The management model is—among other things—based on a strategic contract that the university negotiates with the ministry for a three-year period. The current contract was signed in 2018; as described previously, one of the strategic goals is that a number of courses must be redesigned using educational technology. No specific number of courses is mentioned; neither is a definition of what it means to be redesigned.

The faculty management at ST agreed that there should be support for the implementation or redesign. This support was placed at the faculty's teaching and learning centre called ST Learning Lab. The courses that shall be redesigned are all major bachelor courses—about 180 in total. The vice-dean of education invites the lecturers of the courses in question to start their redesign using a Learning Design workshop.

LEARNING DESIGN

The concept of Learning Design is ambiguous and is sometimes used to refer to a sharable representation of teaching practice that “*can serve as a model or template adaptable by a teacher to suit his/her context*” (Agostinho, 2006, p. 3) and sometimes to an educational development process and methodology of “*devising new practices, plans of activity, resources, and tools aimed at achieving educational aims*” (Mor & Craft, 2012, p. 86). Both Open University (2019) and Conole (2013) use the same definition. In the context of ST and this paper, we use both conceptualisations but refer to them differently. Learning Design (first letters capitalised) refers to the educational development process and methodology, whereas learning design (first letters in lowercase) refers to the representation of teaching practice.

In 2013 Learning Design was adopted by the Faculty of Science and Technology as an educational development methodology for integrating technology in teaching and learning in individual courses and as a compulsory component in the professional development of assistant professors (Godsk & Hansen, 2016). The aim was to provide a more systematic, effective, and efficient alternative to the previously prevailing ad hoc approaches to technology integration (Bates, 2005). Positive experiences and results from the professional and educational development initiatives led to further integration of Learning Design in 2018 in the faculty's strategy for course development for senior educators presented in this paper.

Learning Design for Course Development at Science and Technology, Aarhus University

According to Dohn, Godsk, and Buus (2019), a Learning Design practice is best described according to the six core characteristics of the methodology:

- the introduction of pedagogy-theory through practical models and tools;
- active involvement of educators as the designers;
- the aim of integrating technology for enhancing teaching and learning;
- a focus on students' learning;
- the use of aids, such as templates, IT tools and workshops, for developing, representing, articulating and sharing designs; and
- an ambition to establish a sustainable process of sharing and reusing designs.

In practice, this is actualised by means of design and implementation workshops, followed up by an individual, technical support. A design workshop is organised as follows:

- a face-to-face workshop with a three-hour compulsory part introducing the rationale behind the initiative and the Learning Design methodology;
- five local cases including details about their learning designs and underlying pedagogical ideas and models;
- discussing and sharing the educators' existing experiences with integrating technology in their courses; and
- an activity in which the educators in groups specify and discuss the purpose of the redesign, and clarify the educational priorities and qualities using a template with a so-called 'Quality Pyramid' and the OULDI curriculum feature cards.

Based on the prioritisations and presented cases, the educators describe their individual learning design and use of technology in general terms, together with a short action plan of when this will be implemented and whether or not technical support will be required (see Figure 6).

Course and formalities (Title, ID, ECTS, level, delivery format, etc.)

Strategic aims (strategic rationale for the (re)design)

Purpose: Improve the quality of the education and increase learning;

- Better preparation before in-class teaching (lectures, tutorials, lab)
- Create opportunities for more and better feedback
- Facilitating a progression of students independence during their studies
- Supporting development of collaborative and reflective competences
- Giving educators insight into the students' learning outcome and level of understanding/competence

Course specific aims and qualities (purpose of the (re)design)

The learning design (ped. strategy/model, activities, resources, etc.)

Role of Educational IT

- Classroom aid: Edu IT acts as an aid in face-to-face teaching
- Blended learning: Parts (____%) of the teaching activities take place online
- Online: All teaching takes place online

Technologies (digital learning technologies, tools, and what/when/who)

Barriers and actions (identified barriers and measures)

Quality pyramid

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SCIENCE AND TECHNOLOGY

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Figure 6: The Course Design Template, Including the 'Quality Pyramid'

The compulsory part of the design workshop is followed by an optional three-hour learning design development workshop. The educators are here invited to start developing their learning design in detail using a printed version of the LDTool (University of Wollongong, 2020) and share their design with their peers for feedback. The LDTool makes the students' learning process and activities the backbone of the learning design, rather than the content. This requires the educators to think about what the students are supposed to do, and this way qualify their use of technology, rather than developing technology and materials and then having to come up with a way of making this work in practice. Educational developers and learning technologists are present at the workshop to provide both pedagogical and technical support.

RESEARCH

In the following section, we elaborate on the research question.

Research Question

The aim of this study is to explore how educational technology is perceived and conceptualised by the academic staff in a design process characterised by a dual role of educational technology: as a strategic goal they must comply with and as a means to improve quality in teaching and learning.

Referring to Heimann (1962, p. 164), we might say that educational technology appears on two different levels in the didactic analysis. As a strategic goal, educational technology becomes an organising factor (factors that shape the educators' 'didactic game board'). As a didactic category (media), it must be aligned with the other categories in a didactic analysis: intention (objectives and learning outcomes), content, media or technologies, methods, students' prerequisites, and context (Figure 7). Similar categories are found in the broad concept of a curriculum (see Dillon, 2009).

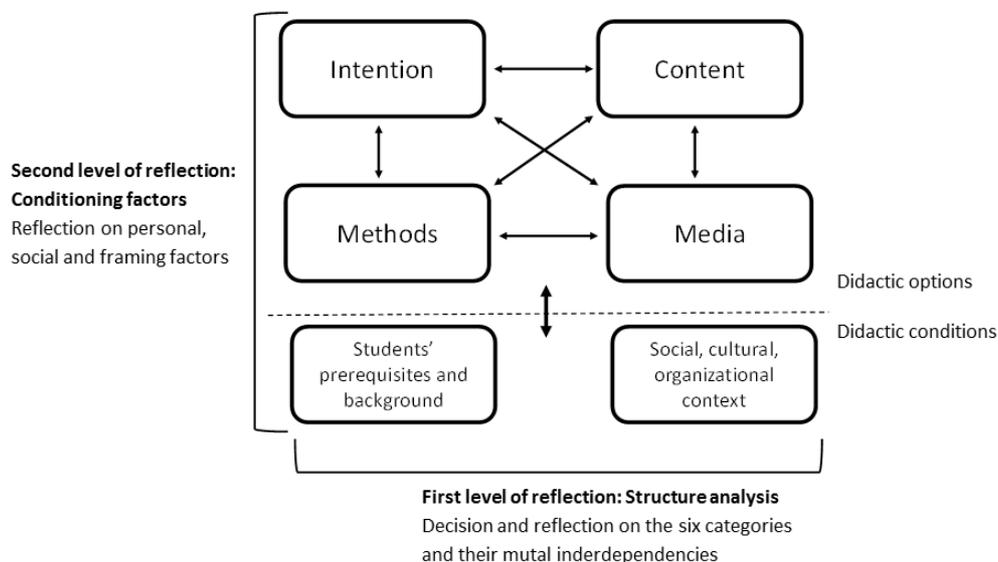


Figure 7: The Berliner Model: Levels and Topics in Didactic Reflection (Keiding & Qvortrup, *Higher education journals as didactic frameworks*, 2018, p. 75)

In this paper, we investigate how these often invisible and, to some extent, tacit organising factors become visible in a design workshop, as well as how potentially conflicting ideas and values are negotiated.

Methodology

The empirical approach combines participating observation, as described in Keiding (2010) and semi-structured interviews (Kvale & Brinkmann, 2014).

The design workshop was held three times in December 2019 and January 2020. The observed workshop was the final one, in which 10 associate professors from eight different departments participated. The participating observation focused on the dialogue between the participants in the design workshop using a single distinction: educational technology versus anything else. This means that only utterances and activities directly linked to educational technology were included in the analysis.

In the analysis of the data, the utterances were sorted into three categories:

Category	Example
Educational technology as a goal in itself	'We could do that, but I am not sure if it will improve my teaching.'
Educational technology as a means to improve learning	'Maybe the students would benefit from video tutorials before they go to the lab?'
Other aspects of educational technology	'I use [LMS] merely as a distribution platform.'

Based on the categorisation of the data from the observation, seven participants were invited to elaborate on their viewpoints in a semi-structured telephone interview. Five participants agreed to be interviewed. Each interview lasted for 15–20 minutes and was recorded.

ANALYSIS

The observations revealed two different ways of talking about educational technology. The following utterances are meaning condensed quotations from the discussions among the educators in the workshop:

1. *"But does this [strategy driven redesign] means that I have to give up my close direct interaction with the students in the lab and communicate digitally?"*
2. *"Maybe we could use educational technology to engage the students between the lectures."*
3. *"But what is a quality here? Do we know that students learn better if we use educational technology?"*
4. *"Educational technology should be used to engage students."*
5. *"Maybe it can support the lectures. For instance, use a quiz or show them something from a field trip."*
6. *"We have these two outcomes. Regarding the first, we actually do not know whether or not they learn it. The second is wrapped up on the blackboard. Could we use educational technology [interrupted]."*
7. *"We mostly use [LMS] as a distribution platform."*
8. *"There are so many tools. What is relevant to us?"*

9. *"I think we must be aware of not making things too complicated for the students; it might be hard to navigate many different tools."*

If we use the three categories to analyse the utterances, we see that utterance 1 and 3 questions whether it is at all meaningful to integrate educational technology. They appear to accept the fact that they must redesign their course towards increased use of educational technology, not because it is a vital didactical thing to do, but because it is a strategic goal forced on their course by management.

Other utterances (2, 5, and 6) address how and to some extent why educational technology might make relevant contributions to the courses, for example, by engaging students between lectures or for assessing learning. Here it is clear that educational technology is seen as what Heimann calls a didactic media. It is quite directly linked to the indicators for quality learning: time on task and formative assessment (Hattie, 2009).

Finally, we observe concerns regarding complexity for both students and lecturers (8 and 9).

The interviews support the overall findings of the observation: the educators see the tension between the strategic goals, but many of them do not care much about the strategic goal. However, all of them see the use of educational technology as a means to enhance the students' learning.

Educational Technology as a Goal in Itself

The workshop was framed by a person from faculty management. The participants felt that this showed commitment from management, but some of them found that management tried to neglect the importance of the strategic goal. As one put it: *"The manager told us that this does not matter a damn thing; it was only done as a way to make the ministry happy."*

When asked directly, several of the educators expressed that they did not care about whether educational technology was a strategic goal; they cared about the use of technology for enhancing teaching. As another put it: *"I don't care about it being a strategic goal. What I find important is that educational technology is used to make the students active."*

Educational Technology as a Means to Improve Learning

In the interviews, we found two overarching uses of technology: to make course administration more manageable and to enhance learning.

Course Administration

One of the interviewed educators had already redesigned his course several times and had functionally integrated educational technology. His rationale for redesigning this time was to ensure that mandatory hand-ins were easier to submit using the LMS's assignment feature. However, one teacher had a different view: *"When you first hear about educational technology, it feels like everything is much easier, but after a while, you figure out that it is not easier, it can do something, and I can't do something else... it is not a silver bullet."*

Another educator had the view that it was challenging to imagine how educational technology could play a major role in his course (what he mistakenly felt was the goal of the workshop—*"to make your course a blended learning course"*). He taught a project course where the students worked in a studio. He did find that educational technology could be used to support

the more formal parts of the course so that a focus on academic competences could be supported and documented.

Enhancing Learning

The interviews revealed different views on what educational technology is. Several of the interviewed educators talked about the purpose of technology. One expressed the view that it was mostly described as video lectures, something he found was not activating the students. For him, it was important that educational technology focused on activating the students: *“It is important that they do something instead of just observing something.”*

Another focus point for one of the educators was the balance between the online and the physical ‘space’—what should be done in the digital space and what should be done in the physical space. He found that the Learning Design method was an excellent tool to foster this discussion.

As described above, the participants constructed a Quality Pyramid during the workshop. The purpose of this activity was to foster a discussion on the teaching quality aspects of the design and thus see the use of technology as supporting learning, not as a goal in itself. Most of the educators found the Quality Pyramid helpful to focus on the teaching goals. However, one did not: *“I had difficulties understanding the idea of this [activity].”* The reason for this could be related to his participation and aim of redesigning a four-week project period and not an entire course.

DISCUSSION

Our results confirm our initial assumption that the educators’ perceptions and conceptualisations of educational technology could point in two directions: as a strategic goal that must be met (disregarding didactic relevance), and as a media for enhancing learning. In addition, we confirmed that these perceptions have some level of influence on how the educators approach didactic design. However, several educators expressed that they did not care much about strategic goals. Instead, they cared about using technology for enhancing teaching.

One of the interesting and unexpected findings was that the perception of technology as a strategic goal shifted towards having educational potential after the part of the workshop where colleagues from different disciplines shared examples of how they had used educational technology to improve students’ learning. This was despite the fact that in his introduction, the person from management presented several didactic arguments behind the strategy. Apparently, the educators’ main take-home message from his introduction was that educational technology was a goal in itself.

In order to facilitate the process, Learning Design proved to be a useful educational development methodology. Its inherent characteristics of making educators conscious designers of technology-enhanced learning, its processes of articulating and sharing designs and practices, and the use of aids such as the Quality Pyramid stimulated important discussions among the educators about the purpose, role, and integration of technology in their courses. We see this as an important step in didactically qualified use of technology in HE, as well as a way to support a systematic, scalable, and potentially efficient introduction of educational technology.

FUTURE WORK

Future work includes further development of our Learning Design workshops to help educators realise the educational potential of technology, with less focus on educational technology as a goal in itself. Furthermore, more emphasis will be placed on how educators can design learning activities for students, including qualifying their designs based on relevant, underlying pedagogical ideas and models.

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