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INTRODUCING THE COLLABORATIVE E-LEARNING DESIGN METHOD (COED)

ABSTRACT

In this chapter, a specific learning design method is introduced and explained, namely the Collaborative E-learning Design method (CoED), which has been developed through various projects in “e-Learning Lab – Centre for User Driven Innovation, Learning and Design” (Nyvang & Georgsen, 2007). We briefly situate this method within the wider area of Learning Design, where after we present the theoretical background of the CoED method. We illustrate the method through discussing its concrete implementation in recent projects and discuss its capacities and challenges in relation to other methods within the area of learning design. Finally, we discuss some challenges related to the CoED-method and the field of learning design in general.

INTRODUCTION

Our aim in this chapter is to present the rationale and theoretical underpinnings of a particular method for learning design called CoED¹ (Collaborative E-learning Design). The method was originally developed by Nyvang and Georgsen (2007) as part of the Learn@Work project, and has since been further developed in other projects we have engaged in as a research collective. The method facilitates design of ICT-supported or networked learning activities. It divides the design process into three phases and uses specific tools and techniques in each phase. It draws on existing techniques which are often employed within iterative design processes such as card sorting and rapid prototyping; however, it entails some novel elements. Firstly, it seeks to address the gap between theoretical models of learning and actual learning designs. It does so by promoting negotiation and reflection among teachers by leading them to identify core pedagogical values, and focusing on embedding these in the actual design. Secondly, it specifically supports a collaborative approach to the design processes where teams of participants (ideally with different disciplinary backgrounds) co-develop learning designs. Thirdly, an accompanying web based software tool makes it easy to re-design the cards used as part of the method. This makes the method both scalable and applicable in different contexts.

In this chapter, we initially locate CoED within the wider theoretical landscape of learning design or design for learning (see Chapter #introduction); then explain the theoretical background to the method and how the CoED method works in practice. With reference to its application in three recent projects, we further illustrate how the method has been used in various settings. Following, we discuss

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the capacities and challenges of the CoED method, and some ideas for how we can further improve it. We discuss how the CoED method relates to other methods and tools within the area of learning design, and how it contributes to this area.

LEARNING DESIGN

Very broadly stated, learning design is concerned with enabling educators to create, design and share pedagogically sound, high-quality designs and effective practices. Whereas early e-learning research tended to focus on the development and sharing of content and structure, the area of learning design signals a move away from an exclusive focus on delivering (digital) packaged content to students towards an increased awareness of designing for learning activity (Conole, 2007).

Even though there are many different interpretations of what constitutes a 'learning design' or a 'learning activity', we find what seems to be a general understanding that a learning design

- has certain learning objectives,
- has a sequential structure or flow,
- consists of multiple learning activities,
- and that a number of resources and learning supports are related to the design.

The relations between learning designs and learning activities are often represented as nested hierarchies, where a learning design consists of several learning activities. These relations can take on more or less formal guises. Some learning design tools are tools for combining and collecting materials and activities, and compiling these into IMS-LD or LAMS compatible packages (LAMS, eXe, CADMOS (Chapter #)) that can be shared and adapted by others and executed e.g. within an LMS (see however Burgos, 2013 CHAPTERXX). Others are web-services or software in which one can describe pedagogical outlook, learning outcomes, sequences, activities and/or materials/supports as pedagogical patterns or various other types of templates/standards. These different formalisations of structure and activities can then be shared with others and adapted in textual and visual forms (e.g. Phoebe Pedagogical Planner, Pedagogical Pattern Collector, The Learning Designer, Compendium LD, ScenEdit (Chapter #), ld-shake (Chapter #)).

These software and web solutions are underpinned by theoretical discussion of the relations between learning designs, learning activities, learning theories, pedagogical approaches, and the particular contexts they are enacted in. The relations are important, as one of the points of learning design is to make teachers more reflective about their teaching practice. This also encompasses providing teachers with theoretically informed models of 'best practice learning designs' to promote better fits between theory and practice (Conole, Dyke, Oliver, & Seale, 2004). In this vein many theorists have worked on creating mappings of the differences and similarities between various learning theoretical perspectives (Conole et al., 2004).

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As explored by de Freitas et al. (2008) more generalised frameworks and models can be useful tools in supporting practitioners' design of learning, but at the same time practitioners need to remodel these to make them useful and meaningful in their own contexts. Alternatively, such standardised frameworks run the risk of alienating and marginalising practitioners (de Freitas, Oliver, Mee, & Mayes, 2008, p. 38).

The CoED method provides guidelines for how to conduct design oriented workshops to help practitioners and designers in designing (online) learning courses, modules or other educational activities. In this way it is similar to Participatory Pattern Workshops (Mor, Warburton, & Winters, 2012) and the Carpe Diem Workshop Planner². The point of departure in the CoED method is the preferences and objectives of the teaching practitioners and their pivotal role in the design process. Thus, a very important part of the CoED method is the negotiation and collaboration on establishing a shared pedagogical vision among practitioners. CoED can be viewed as what Conole (2007) terms "mediating design artifacts" like 'toolkits' (a structured resource that can be used to plan, scope and cost an activity (Conole, 2007, p. 87)). Although there is a web based software tool associated with the CoED method, this does not yield or support practitioners in generating more formalised descriptions of e.g. a course structure or sequence. Nor does it prescribe a particular level of granularity for a design (e.g. whether a more overarching vision for an educational programme or a detailed design of a particular learning activity within a module). In this sense, its capacity for reifying a design is heavily dependent on the participants' own work in using the method's resources when creating a reification of their design idea.

HISTORY AND INTRODUCTION - THEORETICAL AND METHODOLOGICAL BACKGROUND FOR COED

Royce (1970) was among the first to receive wider attention for his reflections on the process of software development. Through his work with software development in the NASA space programme he learned that software requirements were often developed along with early versions of the software, thus turning the development process into an iterative learning process for the developers.

In Scandinavia a somewhat different, but related approach to software development emerged in the 70'es and 80'es. Royce was primarily concerned with how iterations would give better quality products. In Scandinavia attention was also on the development of work contexts and working conditions ie. on the way software would change job content and working conditions (Dahlbom & Mathiassen, 1993; Larman, 2003). Thus, in the Scandinavian tradition, software development also came to involve democracy in the workplace, and involved the participation of both unions, workers, employers and computer scientists.

In education today we face challenges somewhat similar to the ones Royce experienced during the early space programme. When we design for learning conditions change - sometimes rapidly - and the interdependencies between different actors, activities and technologies are many. There is an ongoing need to

find methodological approaches to learning design which will help the involved parties deal with these issues.

Drawing on the lessons learned from Royce, Dahlbom and Mathiassen and others we have been searching for tools or methodologies to support an iterative and learning oriented approach to designing for learning; one which also builds on, utilizes and develops the knowledge of all involved parties. Here we draw on Wenger and his social theory of learning (Wenger, 1998) to maintain the focus on social practices and development. According to Wenger, a social theory of learning must include community, practice, meaning and identity. Negotiation of meaning within a community is the core learning process, and negotiation is defined as a process of participation and reification. This means that learning in an organization - or a team of designers - calls for communicative participation in the process and for ways to develop tangible outcomes of the process.

COED PHASES AND PRINCIPLES

The CoED method facilitates a design process by following five overarching principles, and splitting the early design process into three phases.

Principles - the CoED method:

1. Facilitates conversations about e-learning design
2. Structures conversations about e-learning design
3. Produces design specifications and/or actual designs rapidly
4. Involves e-learning experts, domain specialists and future users of the e-learning design
5. Involves at least two people in the design process

The principles are relatively straightforward and act as guidelines for the overarching purpose of the CoED method: To support structured dialogues and concrete design activities among a diverse group of participants (more than two), and ideally with participants from different domains. Following principle number four, the design process ideally involves learning experts, domain specialists and future users of the learning design.

Phases

1. Focus the e-learning design process (presentation).
2. Identify overarching values and design principles (card sorting and selection through a process of prioritising)
3. Specify design (card sorting and design)

To give an overview of the method we briefly describe the purpose of the three phases. The first phase is usually conducted as an "expert" presentation, whereas the other two phases involve all participants in different card sorting and design activities. However, the exact running and contents of each workshop can and should be tailored depending on purpose and context of the workshop, as we return to in the case examples.

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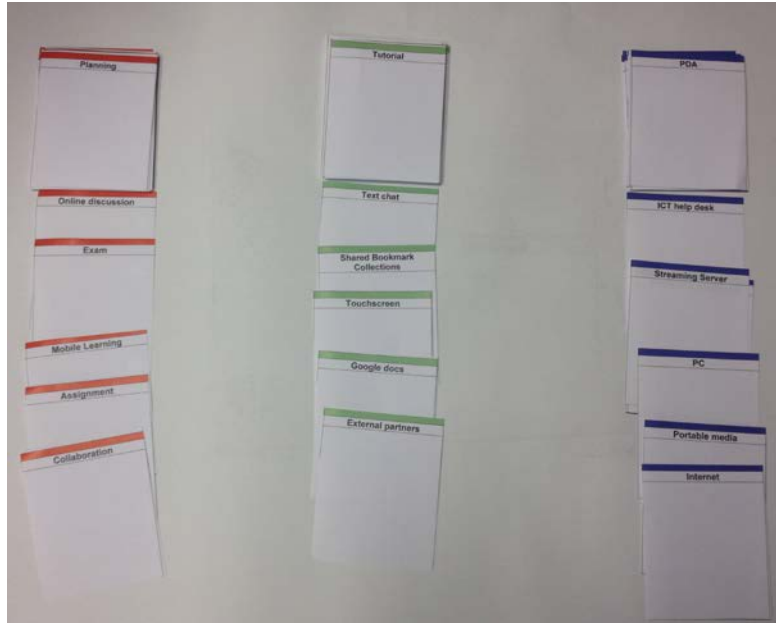
First phase

The initial phase of focusing the e-learning design process is intended to be an “expert” presentation. The presenter, who is usually one of the workshop facilitators, may give an introduction to a topic relevant for the scope of the workshop e.g. outlining differences between more content oriented and more dialogue-oriented teaching approaches or the functionalities of a certain learning management system. The purpose is to establish common ground before entering the design phase, so the initial presentation should be an introduction into pertinent questions related to the scope of the particular workshop.

Second phase

In the second phase participants are tasked with a card sorting exercise. From a number of value cards with value statements or learning orientations the participants need to gradually choose the values and principles that should guide their own design (see Picture 1 for an example). Value statements can be e.g. “collaborative learning”, “skill and drill”, “open educational resources”, “reflection-on-action”, or the like. Often value cards will reflect contradicting or opposing values e.g. collaborative learning vs. individual learning, content vs. process, teacher control vs. student control. Value cards are often designed to be open ended, ambiguous or synonymous to prompt participants’ reflections and discussions, rather than representing clear-cut learning orientations. At the end of the phase, the participants will have to choose a maximum of e.g. five value cards, which they believe are the most important values and design principles. The purpose of the phase is to engage the participants in discussions and reflections on their educational and pedagogical values or principles. Thus, the activity of the phase aims at facilitating and structuring conversations about e-learning design. The particular organisation of the phase can vary and e.g. be split into fewer or more sub-phases of gradual refinement of the values. Likewise, different categorisations and visualisation can be used.

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Picture 2. Examples of design cards

To support the practical work of running workshops based on the CoED-method, an online CoED Card generator has been developed (see <http://old.ell.aau.dk/coed>). The card generator produces a text document (RTF) with design cards and a header card. The design cards fall into three categories, where users can choose other categories than activities, resources and infrastructure. Under each of these categories, users can create as many cards as they wish (e.g. activities such as blogging, writing, discussing etc.).

We present practical examples of how different CoED-workshops have been organised, adapted and facilitated, e.g. in terms of how value cards and design cards have been designed by the facilitators, and how the overarching goals of the workshops have been framed (for a presentation of the first CoED workshop conducted, we refer to Nyvang and Georgsen (2007)).

CASE 1: EATRAN2 - A EUROPEAN PROJECT ON EDUCATION AND TRAINING

Context

A CoED workshop was carried out in relation to the EU-funded research project “Innovative Enterprise Architecture Education and Training Based on Web 2.0 Technologies” (EATrain2). The objective of the work package, in which the authors were primarily involved, was to develop a Problem Based Learning methodology capitalising on web 2.0 technologies. The learning methodology

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would then feed into specific course production and platform development. Following the workshop, three online pilot courses on “Enterprise architecture” (designed for business, the public sector and academia respectively) were developed, run and evaluated. As part of the learning methodology we conducted a CoED-design workshop with the intention of producing a number of preliminary course designs primarily focused on the use of web 2.0 technologies and appropriation of problem based learning principles (Tambouris et al., 2012).

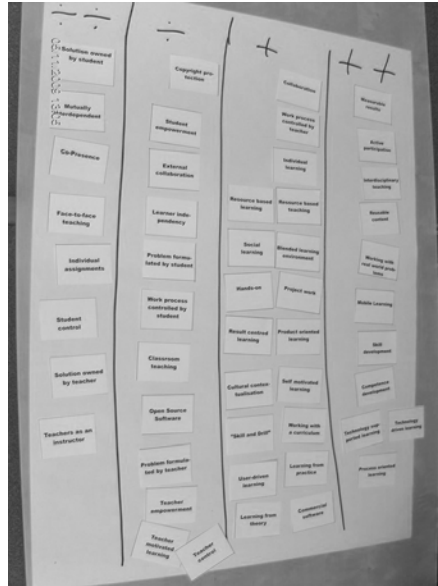
Scope & participants

We customised the design and value cards in relation to web 2.0 and main principles of PBL. In relation to PBL we designed some of the value cards as specifically reflecting tensions between student and teacher control e.g. whether problems would be given to students or identified by students (Ryberg, Glud, Buus, & Georgsen, 2010). Likewise, design cards were designed to reflect web 2.0 activities, resources and technologies, such as micro-blogging, podcasting, geo-tagging, and social bookmarking. The workshop involved ten participants including the facilitators. These were project members from the different partner institutions of which some were teachers or content experts, others working with development of the platform, and some were project managers.

Format

The workshop lasted approximately four hours. In the first phase of the workshop we introduced key issues in the pedagogical design of web 2.0 and problem based learning. In the second phase the participants were divided into two “course design” groups (private sector and academia with each two sub-groups). In these groups participants conducted the first card sorting exercise using the value cards. The participants were initially asked to put the various value cards into four groups: 1) the most important, 2) the important, 3) the less important, and 4) the unimportant. The four categories were marked by ++, +, -, -- on an A1 poster (Picture 3). After this we asked participants to remove the cards from the categories less important and unimportant, and repeat the process of prioritising the cards thus reducing the number of cards to be kept in the most important-categories. In the third cycle the subgroups within the private sector and the academia met and compared what they had placed in the categories “most important” and “important”. In the fourth and final cycle, the two groups had to renegotiate and agree on five overarching values to guide their more specific design.

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Picture 3: Poster for sorting value cards

In the third phase the participants continued the work in two design teams. Each group had a facilitator for asking critical questions and supporting groups in formulating a design which reflected the five core values. These were taped to a header card placed on the A1 poster which participants used to discuss, and place their design cards. The design cards were made using the categories: resources, activities and infrastructure. The design results or preliminary designs can be seen from picture 4 below. These tentative designs, however, were not the most valuable outcomes of the workshop. One problem with the workshop was that only few of the participants would actually be teaching the courses themselves, and therefore had difficulties going into more specific discussion of the course designs (particularly the contents, but also the preferred teaching style etc.).

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Picture 4. Design results from EAtrain workshop

Outcomes of the workshop

As stated above the designs emerging from the workshop were not as detailed as we had initially hoped for. However, the contradictions and tensions identified by the participants during the CoED-workshop had a larger impact on the further process of designing the courses. For example: Would it be possible to carry out a course framed within a problem based learning-approach without a teacher/facilitator? Were there contradictions between the intentions of adopting PBL and web 2.0 learning principles and institutional assessment practices? If students were assessed individually would they collaborate? These became ongoing topics of attention, and even though some of the contradictions were difficult to solve in practice they were helpful in ameliorating or reducing the tensions, as teachers and course designers were conscious of these potential problems. Likewise, it became apparent during the discussions and design phases that the partners held very different ideas of how their courses would be run and supported. These differences had not previously been visible or articulated among the partners. Equally valuable were the participants' discussions of PBL and their different conceptualisations of how much ownership could be relegated to students, and what was the role and responsibilities of the teacher.

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CASE 2: UNIVERSITY COLLEGE SOUTH - AN ORGANISATIONAL DEVELOPMENT PROJECT

Context

University College South is a young institution with five campuses in five different cities in the southern part of Denmark. In 2012 it was decided that all educational programmes should use the same VLE, and an implementation plan was drafted by a task force within the organisation. Not only would some study programmes start using a new VLE, most programmes would also have to switch from version 1.0 to version 2.0 of the same VLE, a considerable change in terms of functionality, interface, and degree of local adaptability. As part of this implementation plan, a series of workshops were planned for all teaching staff in all study programmes. The idea was to involve teaching staff in the implementation process in order to create a sense of ownership and also develop new ways of teaching with ICT in the organisation. For this purpose, the CoED method was used in eight workshops with participants from 11 different study programmes. The envisioned starting point was to involve the teaching staff in learning design by focusing on the teaching and learning activities, rather than on the functionality of the technology.

Scope and participants

Given the fact that a specific VLE had already been chosen, this was to a certain degree integrated into the workshop design, namely in the first phase. An 'expert' presentation opened all workshops, showing different ways of using a VLE for teaching and fitting it into different learning philosophies. The number of participants in the workshops varied from 8 to 55. In most cases, the participants came from only one study programme. In some workshops, management would take active part in the design activities (e.g. head of studies), and in others the administrative staff had been invited to participate as well as teaching staff.

Format

Most workshops took place in three hours, and only with very large groups did we manage to get more time for the work. We worked through the three phases, and at the end of phase 1, participants were asked to formulate specific design or development projects they were interested in. We did this in an effort to engage participants, to make sure that their point of departure was a teaching or learning situation they wanted to improve or develop, and finally to ensure that the participants finished the workshop with a useful product or outcome. Examples of such design projects were:

- Use of blogs and wikis in teaching
- Creating more interactivity in on line-courses

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- Use of portfolio during work placement periods
- Video as a tool for documentation and reflection

Although the design projects had both technological and learning oriented aspects, we encouraged participants to put emphasis on the learning and teaching during the design work, and to be as specific as possible when developing scenarios for future teaching.

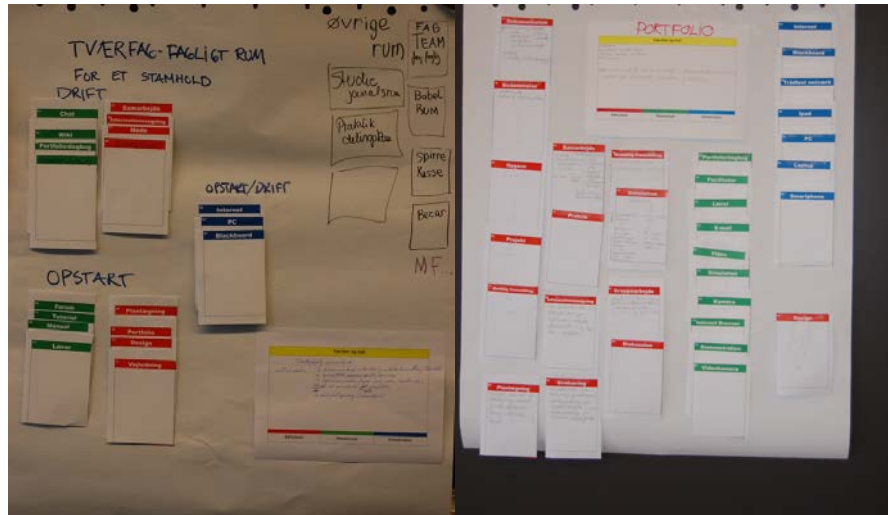
Outcome of the workshops

The first phase basically showed two kinds of problematic behaviour across the workshops. One category of workshops had participants that appeared not to be able, willing or motivated to articulate the underlying assumptions of the current practices, whereas another category of workshops had participants that appeared to be quite content discussing general conditions for their work (the government funding; the level of skills and knowledge of their students, etc.). We see both categories of behaviour as ways of ‘dodging the bullet’ meaning that by either ignoring the foundation or by pointing to matters outside their own control the participants never fully assumed ownership of the implementation process or the appropriation of the technology in question in phase two and three. Some workshops did, however, show more ability and will to engage in deeper discussions about basic values and assumptions. Unfortunately we cannot explain why the workshops came out so differently (apart from differences in the history and culture of workshop participants).

The fact that in most cases the participants came from the same study programme, had the unforeseen consequence that some of the underlying assumptions about the particular study programmes, its students, or the ‘nature’ of the content, were never questioned or even articulated. This was partly a consequence of having too homogeneous groups and not enough interdisciplinarity in the design teams, and partly an illustration of the culture in the different groups of colleagues.

Another challenge in this project related to carrying the design ideas into the next stage of the implementation process. Not everyone in the IT-department were knowledgeable of the overall plan, so even when IT-people took part in the workshops (which only happened in some cases), we were not convinced that the ideas and needs described by the teaching staff in the design sketches were fully understood by the technical staff. The tangible outcomes from the workshops (see examples of designs in picture 5 below) were meant to ensure connection between the rapid prototyping process and the technology development/appropriation later; however, we were not convinced that there was sufficient time and resources to support the full development of all design ideas.

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Picture 5. Design sketches

CASE 3: TEACHERS INTEGRATING WEB 2.0 IN UNIVERSITY TEACHING

Outcome of the workshops

This CoED workshop was part of a PhD project aiming to study ways teachers integrate web 2.0 based activities into their teaching, and to support and inspire them. The workshop was conducted only for teachers at the Faculty of Social Science at Aalborg University (AAU). The overall aim of the workshop was to raise teachers' awareness of possibilities for integrating web 2.0-mediated activities, and to let the teachers collaboratively develop ideas for how web 2.0 activities could be integrated into course-related PBL settings.

Scope and participants

Based on experiences from former workshops the facilitator knew that there could be a potential gap between the designs ideas produced during a CoED workshop, and then the actual implementation of these (as also discussed in case 2). This had been taken into consideration, and the intention was to look at the CoED workshop as part of a longer design process. Thus, an extension of the CoED method was developed, which has been further explained in (Buus, 2012). The participating teachers who signed up for further design-work after the CoED workshop, were supported in the development of their ideas and the transformation of these into actual course designs.

Only teachers were invited to the workshop as they were the target audience of this case. One person from the IT department observed the workshop process, but

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did not interact with the teachers in the workshop. She wanted to watch the workshop process to be able to follow up technical ideas afterwards if needed. Approximately 160 teachers at the Faculty of Social Sciences were invited to participate. Twelve out of the 160 teachers signed up for the workshop, but only seven actually turned up on the day of the workshop.

Format

The duration of the workshop was 6 hours. In the first phase participants were introduced to different definitions and teaching practices involving PBL and social media. Researchers within the area of social media and PBL were invited to make a presentation.

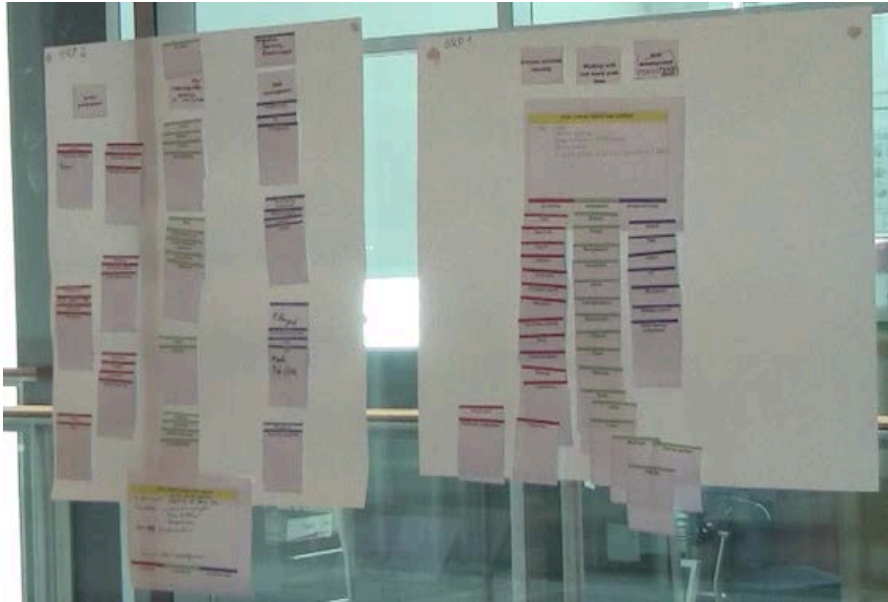
Phase 2 began by defining and negotiating pedagogical values within four groups. This phase became particularly interesting, because although the participants belong to the same organisation and even the same faculty, they engaged in a lot of negotiation and discussion on PBL in an AAU context. All the value cards from the first iteration that were placed in “most important” and “important” were subsequently brought into two groups, who then had to agree on only three shared pedagogical values to base their learning design on.

In the third phase the two groups worked on developing a course design for a prototypical course (for on-campus students with around 160-200 students). The output of this phase was two designs based on both new ideas, but also inspired by activities already integrated by some of the teachers in their courses.



Picture 6. Value cards discussion

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Picture 7. Designs on posters

Outcome of the workshop

One of the challenges in this workshop was to inspire participants to adopt elements from the prototypical course design into their own teaching context. The workshop generated many ideas and seemed to inspire participants. However, the step from 'prototyping' to actually implementing the design is missing. This has been a general experience with CoED. To cope with that issue the facilitator did a follow-up on the workshop offering further technical and pedagogical assistance for teachers. In the follow-up workshops there were three teachers with different ideas of web 2.0 activities, who wanted to make their design ideas more tangible. In collaboration with the researcher, the teachers developed new learning designs inspired from the dialogue during the workshop.

We would argue that the workshop provided the basis for rethinking the learning practice for some teachers. Only three teachers were participating in the follow-up process of the workshop, but others from the workshop may have been inspired and built in web 2.0 mediated activities into their teaching. In later interviews, the teachers we followed stated that the support following after the workshop was important in making the learning design a reality in their teaching practice.

CONCLUDING DISCUSSION

The sum of experiences with the CoED method shows that within half a day, practitioners often manage to create relatively detailed preliminary designs

(prototypes), while also negotiating a shared pedagogical vision for such a design. Additionally, they often find that they have more different pedagogical values and beliefs than anticipated before the workshop. Engaging participants from different target groups gives the dialogue and negotiation a broader variety of perspectives on the learning design process. In practice, as can be seen from the cases, it can however be difficult to ensure a mixture of tutors, teachers/domain experts, ict- or online learning specialist, managers or who might be the relevant actors. In the first case there were too few teachers present (those who would actually be teaching the course), whereas in the second case a large homogenous group of teachers made it difficult to articulate and challenge the underlying assumptions in the programme under development. However, the CoED method can be one way of engaging with different types of practitioners (teachers, managers, it- or online learning specialists) on designing for learning. Moreover, the CoED method provides practitioners with a space for discussing their values, design concrete learning activities, and representing these in a very flexible, yet structured manner. Therefore, it introduces an adaptable and scalable design concept that allows for different levels of detail in terms of the resulting design, while maintaining a strong focus on the negotiation of shared pedagogical core values among a potentially diverse group of participants.

The scalability and adaptability of the method we view as both a strength and a weakness. It does not prescribe a certain level of granularity, but can be employed both to generate visions and plans for a whole online programme. Also it can be used to plan a very specific learning activity within an established course. In this way it does not generate a design as specific as e.g. the Carpe Diem Planner, nor does it directly entail that designs are implemented in a software system and will yield e.g. an IMS-LD or LAMS design. This can be seen as a weakness in the sense that it is at times left to the participants to further detail and reify their design proposal in a more concrete format (e.g. designing the course in Moodle or as a set of distributed tools). As can be seen from the third case (teachers integrating web 2.0 activities into a course design) the teachers stated that the support following the workshop was important in making their learning design a reality. Equally, in the original Learn@work project the initial designs were also subject to further discussion and iterations as part of the larger project. However, as we see in case 1 and case 2 it can at times be difficult to know how the workshops have more specifically impacted and materialised in a final course design. But it should also be noted that we view the CoED-method as one step in longer and potentially more complex development processes (whether or not we as researchers can follow this). A fruitful avenue for further work would be to combine CoED-workshops with other tools and methodologies e.g. having participants working on the basis of pedagogical patterns, produce storyboards, implement design ideas and activities in CADMOS, ScenEdit or ld-shake, as to create stronger reifications of the designs.

However, we also view the lack of prescribed structure and granularity as a strength, as it may invite or allow some more overarching debates to emerge. In all cases it was evident that practitioners held different pedagogical ideals and these

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differences or variations often surface during the CoED workshops. Particularly in the second phase where the overarching values are negotiated. In design processes involving the development of designs in which multiple actors and professional backgrounds are engaged, we believe that this can open up to negotiation of perspectives and understandings which could otherwise have generated tensions between the actors, had they not been brought together. Our experiences also highlight that ‘course designs’ and higher level designs for learning are complex constructs which involves both institutional policies, pedagogical values, distribution of labour and responsibilities. In the EAtrain project it was clear that different assessment formats and institutional policies among the partners shaped how a problem based learning course could be run. In the UC Syddanmark case all kinds of concerns surfaced at both an institutional, as well as a national policy level, and it seemed that not all teachers were equally willing to assume responsibility for the implementation project. This can in one way be seen as ‘dodging the bullet’ and resisting the purpose of the workshop, but on the other hand it could also signal that teachers (or other actors) have legitimate concerns around the implementation processes and the potential changes it could bring about in their working life and responsibilities. During workshops we have experienced how different and sometimes conflicting views of pedagogy and learning emerge among practitioners or between practitioners and the institution’s pedagogy. We have seen how institutional demands are curtailing or enabling particular pedagogies, and we have been involved in larger scale organisational change processes that might be part of reshaping participants’ professional life. These experiences make us ask whether the field of learning design or design for learning could further benefit from discussions and insights from the Scandinavian Tradition. We are wondering whether we should not only be concerned with the quality of the particular product or learning design, but also on how the designs, tools and methods might be part of shaping working conditions and contexts for practitioners.

NOTES

- ¹ Please refer to: <http://www.old.ell.aau.dk/coed/>
- ² Please refer to: <http://www.ld-grid.org/resources/methods-and-methodologies/carpe-diem>

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