International Review of Research in Open and Distributed Learning
IRRODL

THE INTERNATIONAL REVIEW
OF RESEARCH IN OPEN AND
DISTRIBUTED LEARNING

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Cite this article

Norberg, A., Stöckel, B. & Antti, M.-L. (2017). Time Shifting and Agile Time Boxes in Course Design. *International Review of Research in Open and Distributed Learning*, *18*(6), 88–103. https://doi.org/10.19173/irrodl.v18i6.3182

Article abstract

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Time Shifting and Agile Time Boxes in Course Design

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Abstract

The ongoing integration of Information and Communication Technologies (ICTs) into higher education courses is often called *blended learning* although it often relates to course design. It is usually understood in place categories, as a combination of traditional classroom-based sessions and Internet-enabled distance or online learning practices. One alternative understanding of ICT integration can be constructed of time categories, with an understanding of ICTs more as process- and project-related. Two such design frameworks are conceptually presented and then used together in a small case study in a pilot experiment in physics at the preparatory level for entering engineering programs at a university in Northern Sweden. These are a) time shift mechanisms between synchronous and asynchronous learning modes in the course process and b) agile frameworks mechanisms adapted from work process developments in the software industry. Both are here used to address common procrastination problems in flexible education. Data were collected in student interviews and analysed with qualitative content analysis. Results show student satisfaction with the work rhythm and that a feeling of presence, which enables easy interaction, can be facilitated by synchronicity.

Keywords: blended learning, online learning, ICTs and learning, agile frameworks, procrastination, pacing, time shifting, education logistics

Introduction

A *course* is an artefact in formal education, a defined content in combination with learning objectives and normally a set time for completion. The course is seldom questioned as such in higher education, although it has some serious drawbacks in relation to student learning strategies, habits, and pace. It can be seen as an element in an industrial system. If a student cannot complete in the set time, the student fails. This can be a failure of the system if the student can learn under different conditions. Information and Communication Technologies (ICTs) are often recognised for increasing learner flexibility in the modification of time and place conditions, but can also thereby increase problems, such as procrastination.

A course can, if we want, when operationalized, be understood as a project; for teachers, students, and administrators although in different ways; it has a start and a stop and objectives to fulfil in between. Learning to understand content x, master a procedure y, or demonstrating a skill z, on the other hand, may be better understood as ongoing processes, within, between, and outside courses.

The integration of ICTs in various fields of activity in society has largely dealt with making projects and processes more effective and raising quality, and in the longer perspective also meant a redesign of core activities. An interesting thing with the advent of ICTs in the area of higher education is, we argue, that it resulted in spatial conceptualizations of ICTs and the roles they can play in teaching and learning, in four ways:

> **Transport:** To use ICTs as transport metaphors to make *distance learning* possible, transferring campus education from a normal place at campus out to reach new groups, by sending, recording content, or recreating classroom events. Synchronous video-conferencing from studio to studio is one example. Just trying to imagine the literal implications of the term *distance learning* shows some of its center-periphery spatial thinking.
>
> **Other-worldliness:** To adapt and run the course, in another world, the *online* or *virtual* world, including teachers, learners, and material. One such example is the use of a Learning Management System (LMS), sometimes called the *virtual campus*. Still, the learner does not live in any cloud, and the necessary physical whereabouts of the learner can be more or less beneficial for learning.
>
> **Blendedness:** To use the face-to-face classroom in parallel to an online environment, as an LMS, in an attempt to combine the best from two worlds. ICTs are here connected to the campus environment more closely again, but teachers and students tend to become focused on the distribution of learning content in physical or virtual spaces, alternating between these places by log-in-log-out procedures.

In this paper, we depart from the commonly used spatial theorizations of ICTs in university education as the primary focus. Instead, we propose a time perspective as an alternative dimension to further our understanding of ICT integration into university teaching and learning processes.

We present as an illustration a case from Luleå University of Technology (LTU, www.ltu.se) in Northern Sweden where we designed and tested time tools in course module in Physics at preparatory level[1]. A preparatory course is aimed at upper secondary school graduates who need additional tuition and credentials before entering a specific university level program.

Our general research question is to evaluate how useful time-related categories, terminology, and understandings are in course design with ICT integration. For this presentation, we concentrate on the students' experiences and views of this model. Our research question was:

How useful are time-related perspectives such as time shifting and agile mechanism as design principles for an ICT-enabled course module at preparatory level?

Before proceeding with presenting our research study, we provide a brief clarification and background of the concepts we use. Some of these concepts are widely used in literature (like *blended learning*), while others are less familiar or emerge from our past research and different research fields (for instance *agile project frameworks*).

Blended Learning

The term blended learning (BL) will probably never get a standard definition but is commonly understood as the combination of something traditional and something new and digital in courses (places, course material types, communication tools, pedagogies). BL is a problematic term but frequently used in higher education, albeit slightly different in North America and Europe in the research domain (Norberg & Jahnke, 2014). BL tends to be mainly concerned with the organisation of teaching. How students use old and new technologies to learn often falls outside the area of BL (Sharpe, Benfield, & Francis, 2006, p. 26, 54). Oliver and Trigwell (2005) remark that the word *learning* should be returned to its rightful owners, the students (p. 24). They do not think that the metaphor of a *blend* is helpful. Sharpe et al. (2006, p. 4) on the other hand, warmly recommend the use of the term BL, just because it lacks an agreed-upon definition. Thereby, it allows teachers to experiment and negotiate its meaning themselves. Seen from another angle, the research fields of BL, and for example Technology Enhanced Learning (TEL), and Computer Supported Collaborative Learning (CSCL) can all be seen as studying and conceptualising the *long-term integration* of ICT tools into new normalities of learning processes in higher education, rather than studying *blending*. We do not talk then about ICTs causing sudden disruption as about more sustainable long-term changes of operational modes in higher education. ICTs become more of augmentation to human ability than imagined as alternative technology-supported places for activities. These new human abilities to communicate, teach, and learn can compress, modify, and unbundle time and place obstacles in a one and only world of human interaction. "We are probably the last generation to experience any difference between offline and onlife," writes the information theorist Luciano Floridi (2007, p. 61) thereby leading out of a divided ontology with the traditional physical-social world and the new digital one side by side, which humans traverse by log-in and log-out procedures.

Time and Blending

One idea about acquiring a more sustainable perspective is to leave place-and-education focus behind and try to give time-and-education focus priority instead. One such time-related attempt is represented by Power (2008) with his *blended online learning* and Norberg, Dziuban, and Moskal (2011) with a *time-based blended learning model*. These studies suggest an alternative conceptual model of ICT integration in mainstream courses. It is not primarily about classroom and online, here and there, real and virtual, but about shifting synchronous and asynchronous modes of communication and work during a course period. This is, in a way, old and trivial: to gather students for a day at school and give assignments for homework follows this pattern – as well as the modern flipping of the classroom; typically to listen to lectures at home and practice, discuss and study in school. Some tools and media, old or new, are synchronous, like classrooms, video conferences, webinar, telepresence, and chat, other for asynchronous use; like print, recorded lectures, and discussion forums. A design task is to choose tools for the synchronous and asynchronous modes while also thinking of the shift between them, so work in one mode points forward to the next coming. Norberg et al. (2011, pp. 212-213) show some characteristic kinds of

change with ICT integration: *Asynchronous support, synchronous location, migration, flow, and empowerment.* We use this below for orientation in the ICT-integrated course design landscape.

Procrastination and Asynchronicity

Some problems are more easily understood with a time-related model as background; one we will focus on here is the pacing of student work in relation to course design. Online courses and blended courses with much asynchronous content can become a culture shock for many students when it comes to personal time management (Leeds, 2014). It seems that the more asynchronous, and thereby flexible a course is, the bigger the risk for procrastination; flexible work tasks are postponed. The situation at the end of the course becomes unbearable, and even unhealthy – and students may not succeed in completing their course (Elvers, Polzella, & Graetz, 2003). A covariance can be demonstrated between procrastination and non-engagement in forums in courses (Michinov, Brunot, Bohec, Juhel, & Delaval, 2011). Many know the mechanisms of procrastination, and some have learnt to somewhat control and use it for productivity, becoming addicted to deadlines for getting anything done. Modern strategies for addressing procrastination in ICT-supported team processes are available.

Agile Project Frameworks

We discovered that big projects in the computer programming sector have for some years worked rather successfully with addressing procrastination in the workflow. Development of software can cover long periods, up to a couple of years. Earlier the dominating work project model was strictly sequential and not easy to pause or rewind. From the customer-negotiated detailed specifications, a strict work plan was laid out with the production stages all in high detail up front, often represented by a Gantt chart. This is commonly called a *waterfall model*. The work phases, dates, dependencies, and expertise needed were mapped up. The distribution of work was between expert teams; software architects, business analysts, code developers, interface designers, subject matter experts, testing teams, and so forth. A waterfall project plan, as in MS Project, looks impressive. However, a common experience is that difficulties pile up towards the final product delivery where everything must work together. Delays also pile up near the end of the project, where enough time and resources are not available. In retrospect, the needed time and resources had often been available in the first part of the project, but the teams had not been able to work effectively since work conditions still were very flexible, much was still undecided and procrastination common. Furthermore, the isolation of the project as a whole, while development in relevant fields went on in the world outside, could also result in disappointed customers, although contract specifications for the product had been met.

Some innovative strategies to address these problems have been developed, interestingly enough partly in parallel practice. These strategies are incremental; step-by-step, instead of purely sequential; they are cross-functional instead of highly specialised, and they build on self-organizing teams and are in communication with other developments in business and society, which also are allowed to affect the project. Below, we describe *Scrum*, the most known agile framework from the regularly updated Scrum guide (Sutherland & Schwaber, 2016).

Scrum has three roles; Product owner, Team member, and Scrum master, three artefacts; Product backlog, Sprint backlog, and Product increment, and also ceremonies: Sprint planning, Daily scrum and

Sprint review/retrospective. The coordinator of the project as a whole, the *product owner*, has a list of ranked and prioritised *backlog items* for the final product; work tasks that must be done within the total project frame to produce functions in the software that the final user should expect. These are expressed in *user stories* ("As a <type of user>, I want <goal> so that <reason>"). This stack of backlog items can be adjusted and reprioritized due to new experience and communication in-and-outside the project, and there can be emergent and disappearing items. Teams led by a scrum master accept to work on one or a number of items received from the product owner for a short, self-contained project period, typically 1-4 weeks, which is called a *sprint* or *time box.*

The team leader, the *scrum master*, coordinates the team to do a careful day-by-day planning by breaking down the backlog item into time-estimated work tasks, forming a *sprint backlog*. These tasks are prioritised and agreed upon by the team members. The scrum master protects the team from outside disturbance while working, watches what still is left to do, and removes obstacles, in addition to being a team member. Daily status of the team members work is reported in a short morning meeting called the *daily standup,* which the scrum master leads. It lasts for a maximum of 15 minutes, and consists of all members answering three questions: What did I do yesterday? What am I going to do today? and Are there any problems? Problems are listed by the scrum master on an *impediment list* and should normally be resolved before next stand-up, or the sprint planning must be altered, but objectives not decreased. A *Kanban board* with post-it notes in columns (*To Do, Doing, Done*), on a white board or online, shows daily progress and enables transparency. The result of the sprint is a potentially shippable product increment, which is demonstrated and discussed with stakeholders (*sprint review*) and the work process evaluated in the team (*sprint retrospective*).

Thus, in a big total project frame where flexibility remains on the project level, team members always have concrete work to do, test and deliver within a time box. The team should have a stimulating, but not critically stressful, situation of work and they should feel satisfaction when a work task is done. The most frequently discussed question in agile projects seems to be about the definition of done, on which team members must agree. Not that what is done must be perfect and final, but that it works is potentially shippable for the time being, and permits people to concentrate on new tasks. The work pace should be sustainable, and it should be fun to work, people also then do better work. (Sutherland & Schwaber, 2016). The incremental approach is illustrated by jokes as "How do you eat an elephant? One piece at a time."

Agile Frameworks and Education

We find that there are both similarities and differences between courses in education and projects. School can remind us of a waterfall project; not detecting or ignoring problems that should have been resolved for keeping up the planned pace instead; placing possible application values with education very far ahead, being subject-based, specialised, and ending up in not-so-updated learning outcomes. If a student falls behind, he or she often stays behind, partly due to the organisation of the system and not necessarily because of inability to learn. A recurring problem is procrastination, which increases with flexibility. There are also important differences: When student fulfils a course objective, it can hardly be seen as a deliverable product, although it is believed to be testable, and teamwork in programming and learning in

social context works somewhat different. In a course it is not enough if only one student works with a specific course objective, all should reach it, and so on. Software development is a business activity.

Different agile strategies show considerable similarity; Scrum, XP, Lean, and Atern. Representatives for different agile methods met 2001 and formulated the short *Agile Manifesto* (http://www.agilemanifesto.org) with four altered priorities. Traditional items at the right are declared as still valued, but items on the left are in agile thinking valued even more:

Individuals and interactions	*over*	processes and tools,
Working software	*over*	comprehensive documentation,
Customer collaboration	*over*	contract negotiation,
Responding to change	*over*	following a plan.

The four basic altered priorities above from the agile manifesto can be adapted to thinking of education; here is D'Souza and Rodrigues's (2014) version as an example where they value items in the left column higher than those on the right:

Students and teachers and their interactions	*over*	administrative processes,
Working knowledge	*over*	grades,
Collaboration with students	*over*	fixed syllabi,
Responding to change	*over*	following a plan.

Agile pedagogy is an expression that shows up increasingly often, with varying idea content for education reform. No coherent theoretical framework has knowingly been formulated, but some researchers see development possibilities in this direction (Stewart, DeCusatis, Kidder, Massi, & Kirk, 2009; D'Souza & Rodriguez, 2014; Royle & Nikolic 2016; Foster & Ruiz, 2010). Courses on agile thinking and project strategies are created and tested in computer science at some institutions (Soundararajan, Chigani, & Arthur 2012). Teachers use Scrum for running software development courses in more realistic and team-based modes instead of as a solitary student activity (Slaten, Droujkova, Berenson, Williams, & Layman, 2005; Perera, 2009). For the K-12 level, the Agile Learning Centers movement is working on self-direction of learning in micro-schools (http://www.agilelearningcenters.org). Agile strategies are also utilised for development and management of e-learning- or blended systems (Tesar & Sieber, 2010; Doherty 2010). The classic waterfall process in North American instructional design, ADDIE, is increasingly being altered into agile ways of working instead (Groves, Rickelman, Casarino, & Hall, 2012). What we are trying here is different. We develop new strategies, inspired by agile frameworks, to directly address procrastination in courses with a high ratio of asynchronous modalities. We have a suitable time-shifting map over the ICT-integrated course, with the synchronous - asynchronous time shift pattern, to be able to do it.

A Case Study: Design of Modules in Physics

Context of the Case

At LTU, the preparatory year for entering technical university programs (*Tekniskt basår*) existed only in a campus version, but a more flexible accessible solution was planned in 2013, first called the *distance* version. If Swedish students do not have the required grades in STEM subjects (science, technology, engineering, and mathematics) from upper secondary school for entering STEM university programs, the preparatory year is a common solution. The content is at the pre-university level, but the courses are provided by universities. It is known to be very intense and demanding. The focus is on qualifying for admission the following year. It is considered as a hard case for distance and online education designs, and low success rates are common. Some Swedish universities have closed down the preparatory year distance offerings because of this and because the national financing system now rewards the institutions mainly for students that finalise their studies.

The long-term aim of the planned project was to supply the engineering educations with more students by providing a modern and well-designed distance education built on pre-recorded lectures and demos and a creative use of Open Educational Resources (OER), in a Learning Management System. For this, a pilot project was set up. Some demanding modules in the course *Physics B: Waves, Light, Induction, and Electro-Magnetic Radiation*, were to be developed by an instructional designer together with teachers and students and then tested for acquiring experiences for the further development of a distance version of the whole preparatory year.

In the planning phase of this distance experiment, the attention turned from the place thinking (distance) to time-, project-, and process perspectives for enabling inclusion of students with varying place and time conditions. A thought was also to use the developed material for campus students and for an existing open entrance solution (*Öppen ingång*) to engineering programs. The distance was not the problem for the nine (of the about 100 students in the campus course, that chose to participate in the pilot project. They attended other courses on campus simultaneously, but in the pilot project on Physics B they were physically separated from teachers and peers – although not barred from attending lectures, they did not choose to attend.

Two Time-Design Components for the Pilot Course

The design was informed by the constructivist Community of Inquiry (CoI) model (Garrison & Vaughan, 2008). CoI is frequently used for blended learning design and emphasises the balance and intersection between three forms of presence; social, teaching, and cognitive presence. On this theoretical basis, two design elements were integrated:

  Design Component 1: The synchronous-asynchronous time shift. Students work with the asynchronous material, Open Educational Resources, (OER), and related assignments during Mondays to Thursdays, with a detailed plan, called a pacing guide, for what to do each day. It was possible to have some flexibility between days at the beginning of the week. Thursdays were for synthesising learning, reporting status, and questions to be resolved in a mandatory synchronous meeting via Adobe

Connect with the teacher on Fridays to check up progress, discuss questions sent in beforehand, and give support on difficult sections. The ambition is that time and process can keep the course together and constitute the base for peer and teacher interaction (social and teaching presence).

Design Component 2: Agile-inspired mechanisms for pacing. We defined and implemented three mechanisms from agile frameworks:

A. **Time boxes.** The week constituted an agile *time box* or *sprint*, designed as a self-contained project unit with a deliverable demonstrating mastery at the end of the week when the sprint was *done* and the week's learning content could be left, for the time being, concentrating on what was next. For emphasising this, we promised that weekends would be free if the plan was followed.
B. **Time box planning**. We saw the course learning objectives as product backlog items, and broke them down into a week planning; a sprint backlog, so there should be no hesitation on where to start and what to do and how to go on. This was called the *pacing guide* and was reinforced by a customised *checklist* for each day to fill in, and a status report to be sent to the teacher on Thursdays.
C. **Transparency** possibilities between students in parallel work during the time box were important to implement for creating a team feeling, but we did not know exactly how to create this. We were expecting that the LMS discussion forum would show to have a new relevance when students knew that they probably were working on the same thing the same day, and left it with that.

Method

Participants

There were nine participants in the pilot course, of which eight were interviewed; four men and four women. One participant had accepted but postponed interview meetings until too late. The interviewed participants were of ages 19-34, with a median age of 23 years, and had attended upper secondary schools in Southern Sweden (n=2), the Stockholm area in Mid Sweden (n=2), and Northern Sweden (N=4). Upper secondary education was the only education background for four students, two had started but not finished higher vocational educations, one had military university college studies, and one had studied university courses, also distance courses. They were all focusing on qualifying for technical and engineering university programs after the base year, in all from computer game programming to architecture. They had chosen this pilot course of one or two reasons; for increased flexibility as they had to travel to campus (n=2), had small children (n=1), part-time work as a skiing instructor (n=1), wanted to work on their own instead of attending lectures (n=3), wanted more material to work with than in ordinary campus setting (n=2), and wanted more variated asynchronous and multimedia material to work with due to dyslexia (n=1). In the results, the men have the nicknames Karl, Tomas, Erik, and Olle and the women Anna, Siri, Julia, and Maja. Permission from the regional ethical review board was not needed as the participants were adults and the rules from the Swedish Research Council (2011) on informed consent and other relevant ethical demands were followed.

Data Collection and Analysis

First, an agreement was made with the department, teachers, and course management staff. A guide for semi-structured interviews with open-ended questions was prepared and refined in discussion between authors. The focus of the interviews was to acquire data about the students' experiences of the pilot course in general, and especially the time and pacing design elements in the learning process and the experiences of social, cognitive and teaching presence. The participants were informed beforehand about the general aim of the study, their voluntary participation, their right to refuse to answer or leave during the interview and the use and safe storage of the anonymized interview data. After the course modules had been completed, the first author conducted and recorded the eight interviews, which lasted between 23 and 35 minutes. The interviews were transcribed and read through several times for acquiring a broad first understanding. The text was then processed, and meaning-bearing units in the transcripts identified and discussed. Subsequently, the meaning units were abstracted, coded, and sorted into groups with related meanings and abstracted into five subcategories and two main categories, using Mayring's (2014) qualitative content analysis. Subcategories and main categories are presented in Table 1.

Table 1

Subcategories and Categories in the Analysis of the Learners' Experiences of their Learning in the Pilot Course

Subcategories	Categories
Overview of work	Personal control
Work flexibility	
Taking learning control	
Peers on demand	Social tuning
Teacher synchronisation	

Results

All eight participants reported an overall positive experience of the pilot course. This satisfaction varied in strength and underlying reasons.

First, our data shows that a part of the satisfaction relied on the provision and design of asynchronous learning materials on the learning platform, which we not had set out to study per se, but showed to be important for the cognitive presence of the CoI model (Garrison & Vaughan, 2008). Students were satisfied with the short lectures and tutorial-type YouTube films, the direct connection between instruction and application problems to work with, and the customization of the material directly connected to the course objectives, which was reported to be a difference in comparison with the campus setting:

> The [video] clips are short… but if I'm sitting in the lecture hall where we're over a hundred, it's not possible to raise your hand and say, "Excuse me, can you slow down a little so I can take

notes," and [if] you want to listen while taking notes it becomes chaos and you don't see what notes you've made. (Maja)

The students also commented spontaneously on the physical separation from the teacher and fellow students. Two students were clearly ambivalent, although they were satisfied with the work mode during the period. Anna said "I really miss campus a lot" and tried to organise face-to-face study meetings as a complement but gave up since there was little interest. Siri both meant that "it is harder to focus on campus" but still also thought: "but being on campus is a lot more fun."

Personal control, our first main category, comprises meaning-bearing units related to the individual experience of increasingly taking more personal control over the learning process. The students seem to be used to the situation of not knowing how much work there is, or is left to do, and also that not previously announced work can suddenly show up in a course, even late. Also, the uniform pace of lectures and the time and place demands around them are contrasted to experiences of working with content in the pilot course.

Overview of work (subcategory) was reported as being different in the pilot course compared to campus studies; students experienced better control over their own study work situation just by overviewing it better and being able to plan it better. What Siri and Julia say about starting difficulties due to limited overview is interesting.

> It was really easy to understand and very comprehensive. If I have a clear picture of how much it is, then it is easier to take oneself through it as well. It's a big step to start if you don't know how much there is. (Siri)

> The difference is probably that I feel freer to work on my own and can work when I feel like it. I don't feel that I must wait for the next lecture and don't know what I have to do any longer. Or feeling it's too much or not knowing what it is I need to do. (Julia)

Concerning the subcategory *work flexibility*, students reported having been able to work when they had time, or could save time, and also appreciated the weekly repetitive rhythm as a support structure. They did not seem to think the quite detailed daily and weekly design had limited the flexibility so much, but rather helped them along. Olle told that "when I had time, I could sit down and study...exactly (emphasised) when I had time for it." Tomas saw possibilities to work to earn his living:

> If it all were like this, I would have been able to work too if I wanted. These studies cost me a lot of money, study loans and all that, and I have not been able to work that much. (Tomas)

Karl saw the time savings with not having to travel: "If I had been able to do the whole year at home, I would have saved two hours a day. More time. One more hour to sleep and one hour more studying." For Anna, the increased flexibility combined with weekly rhythm meant better personal life-puzzle control:

It's good to be more in control of what to do and when. It has been chaotic to come back to campus. Just having [assignment] submissions every Thursday, it's good having it [routines] like that. (Anna)

During the period, students developed their work habits during this period; they were in some respects gradually *taking learning control* (subcategory). One student, however, procrastinated more and more, but said he wanted to do it, he did not do anything special on weekends anyway, and he had still the control he wanted (Karl). For the other, the course design seems to have been of some help not to procrastinate, but it took time to detect the personal affordances within the general design of the course.

At first, I didn't work as flexibly as it essentially was [set up to be], I just worked through everything in one sitting, as much as I could. Then I discovered what I had problems with, and focused more on that. (Olle)

The checklist had been a good help for some of the students; other did not use it:

Great reward system…it has been the biggest carrot to want to do it during the right day, and check off those [boxes]. Which I miss now when I'm back in the traditional [class], it is hard to know what to do this day; then one has to plan something oneself…but when I know I have until next week, it becomes a little like, well…but now it really was Yes! Now I do this today! I wanted to check the boxes, and it felt really good (laughter). (Maja)

Three students reported the course as being likely a start of studying in a slightly different way in campus courses as well, while other found it hard to transfer their experiences to campus studies. Two students proposed a campus version of this kind of setup as in the pilot course, to have alternatives in learning: "After this was over, it was hard to bring this way of thinking when I only went to lectures" (Maja);

After this [experience], I actually skipped some lectures and relied on YouTube instead. Mostly, this [skipping strategy] works really well. Not only in Physics, but also in Math and Chemistry… Chemistry especially since it's hard to understand the lecturer. (Anna)

Social tuning is our second main category constructed by the categorisation of meaning-bearing units (see Table 1). With this is meant both the establishment of peer learning between students when studying which we as subcategories called *Peers-on-demand* and *Teacher synchronisation*, relating to the weekly meeting on Fridays in an Adobe Connect meeting when the week was concluded. Technology-enabled courses are often regarded as lonely learning processes, but our students seem to frequently have used some of the tools provided for interaction when they needed help from peers.

The *Peers-on-demand* experience was facilitated by knowing that other students were studying the same content at the same time. It seemed easier to ask for help under such circumstances; it felt more like teamwork even if the students were not sitting together. A mutual feeling of presence seems to be supplied by the synchronisation of work, which enabled peer interaction.

> If you're on campus [in the ordinary course], it's easy to get lost in daydreams, and those who know more help only themselves and I myself feel a little inferior then, and then I don´t dare ask for help. Although here [in the pilot course]…I only had to write [on the forum] and so it became more anonymous, but we knew who we were …and those who had time replied…[in this situation] you don't feel so much like you're a burden (Maja)

One week the nine students wrote 129 comments to one another in the forum, and it was continued in Skype and on cell phones, but not in the reserved rooms on Adobe Connect. Olle describes his experience: "I wrote in the forum if anyone understands this and I got back that I need to look at it [the problem] this way instead."

Other students thought it was easier to get help on campus, especially just short explanations:

> When I have a problem I do not need to solve [it] at once, but if it is something I haven´t understood, and the day after or similar when I am in school I can talk with my friends there and learn from them….that is a thing I miss a little with this distance version. (Karl)

Teacher synchronisation as a subcategory relates to the synchronous meeting with the teacher in Adobe Connect on Fridays and was also meant to provide a clear rhythm in the studies. Students had on Thursday turned in assignments for the week, written a short status report how they had managed the studies and sent in questions or request for help on something difficult or unclear. The students seem to have appreciated this synchronous design feature; they were "seen" by the teacher, but also somewhat confirmed as members in the course by other students. It also worked well as a closure mechanism; it was "done" in the agile meaning: "We felt that the teacher knew we were there, asking how things are going and such…that feels good" (Olle); "It was not perhaps anything special I was thinking of before the Friday meeting, but when I came there….exactly, precisely, yes boy this….this is good. We must have that" (Julia); "We got kind of a closure of the study week and could get to know if others than I thought it was difficult – that it probably wasn't fun for them either" (Anna); and "I wanted to be done and say that I have done this (emphasis)**,** so I could be free during the weekend" (Julia).

Discussion

This was a small design experiment. The participating students had chosen the pilot course as an alternative to conventional campus studies, and they each had their reasons to do so. On the other hand, they had something as a reference; their parallel campus-based studies. The students on the preparatory year are in general, quite focused; their studies do not have much of meaning if they cannot finalise them and be admitted to an engineering or natural science program. They can be expected to concentrate exactly on what to learn to pass the test because these studies are mainly instrumental in getting them where they want. Not all courses can be designed as concretely as these kinds of courses, planned day-to-day and week-to-week, in high detail by teachers and instructional designers.

The students seemed to have acquired good control over the increased flexibility with the time-related project tools and structures we provided, and not reacted too negatively against the detailed day-to-day design. We do not, however, know anything about how this could have been further developed in the long run, for broader groups and as a mandatory structure.

Both the Social and Teaching presence in the CoI model (Garrison & Vaughan, 2008) seem both to be reinforced by the synchronous design in the meaning that the students worked side-by-side, physically separated but in interaction, and by the regularity of synchronous sessions with the teacher, which also marked phases in the study work. For enabling the cognitive presence in the CoI model, the use of well-structured OER seems to have been important. The balance between the three types of CoI presence seems to have worked out.

The pilot course was considered promising but did not lead directly to a development of an extended flexible version of the preparatory year and did thus not enable direct iteration for further design-based research. The involved department at the LTU continues to look at course design from a time perspective, with shifts between synchronous and asynchronous modes. The time boxes are kept in the learning platform. Most appreciated by the students was the detailed study plan, the *pacing guide*, so that was introduced to ordinary campus courses, as a way to help students avoid procrastination. The students also appreciated that the material was so well organised and easy to find, with all different parts being segmented into short, discrete sections. This can also serve to increase the critical through flow in the basic courses in mathematics and physics, and plans are to introduce the concept gradually in these courses where many students experience problems. The final goal is to have the concept introduced into a majority of basic courses in STEM subjects. For more advanced courses the agile framework can still be used, but the students should be more involved in the sprint planning where the backlog items are determined. The continuation of the project also involves educating the teachers in the way of working with agile course design, and that task should not be underestimated.

A Swedish university can today have offerings of the same course in several distribution formats: traditional campus format, decentralised but in classrooms, synchronous video conference and asynchronous online, and many combinations thereof. This demands different teachers, varying student recruitment strategies, and varying technology. We can imagine a reduction to only two basic forms of course offerings that are: a) time-blended, and b) asynchronous, so the number of forms is reduced. The blended form can then fill many of the distance needs of today, just by being able to include both full-time campus students and students with different limitations concerning time and place in one and the same form. This could be a basis of a new education logistics for widening participation.

Conclusions

To work with time perspectives in the design of a course is both old and new. Every teacher knows critical issues connected to the time available in the planning of a course. However, ICTs have so far been understood more as place-modifying and transporting technologies in education. From this experiment,

we conclude that a time and process perspective is useful for the improvement of courses in different respects, and these courses can, at the same time, be designed to include students with time and place obstacles to face-to-face participation in classrooms. In a world when communication possibilities constantly improve, and people become accommodated to the communication tools, time factors are likely to gain interest (Norberg, 2017, p. 52). Further research is needed both on a larger sample of students over a longer period and on other course content, but also on a broader spectrum of time issues in education, interacting with place.

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