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THE FIRST YEAR EXPERIENCE AS THE CONTEXT OF USE

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ABSTRACT

The Technical University of Denmark (DTU) is implementing a new Learning Management System (LMS). Successful scaffolding via an LMS requires in-depth knowledge about how students perceive and use the content and the system.

According to the *Situated Action*-approach, however, human activity and thinking is based on a "swarm of contingencies". Thus, nothing can be understood without first understanding its context (Button & Sharrock, 2009, p. 78).

This implies that careful design of content and flows in the LMS will fall short of supporting student learning, if teachers fail to understand the contingencies surrounding the students' use of the LMS, which might impair their focus and understanding.

In order to increase our knowledge of students' use of the LMS an initial qualitative study was carried out. In particular, the aim was to start exploring *the context of use*: The first year experience, motivation, work pressure, and coherence in order to see which aspects might influence the students' use of the LMS and their learning process.

This preliminary study did reveal that the students experience a significant amount of confusion and stress. Especially the overwhelming transition from being a high-school student to the more independent life of a university student seemed to take a toll on the students. This paper presents and discusses these findings and suggests how they will influence our further study and use of the LMS.

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1 INTRODUCTION

The Technical University of Denmark (DTU) is implementing a new Learning Management System (LMS). The chosen platform is Brightspace (D2L). The new LMS offers teachers many new possibilities. At the same time, it is a challenge to utilize these possibilities, since the teachers are not familiar with – and to some extent overwhelmed by – many of those new functions and possibilities.

The motivation for the study presented and discussed in this paper was a question of how best to scaffold the students' learning process via the LMS. There was a sense that not all students did access the course materials as intended. If the scaffolding provided via the content in the LMS does not actually reach the students there is a risk that student learning may be impaired. Hence, there was a desire to know more about how the students interact with the LMS and the content in order to understand the student experience.

The informants of this study is a cohort of first year students in the *Process and Innovation* bachelor of engineering programme at DTU. The new LMS is being used in most of the first year courses. One of the authors of this paper (K. From) teaches one of the courses, *Design, users, and ethics* (5 credits), in which the teaching method is primarily flipped classroom, hence increasing the importance of students using the course material as intended.

The initial study, however, did not focus specifically on the students' interaction with the LMS. Instead, the study took a more explorative approach in order to answer the following questions: Which *contingencies* influence the students' *first year experience* and use of the LMS and how do the students define the *context of use*?

One of these contingencies was assumed to be a heavy workload. In the fall of 2019 a total of 62 students were enrolled in the *Process and Innovation* bachelor of engineering programme at DTU. Only 33 respectively 28 students passed the exams in mathematics respectively physics at the end of their first term. In other words, only a bit above (53%) respectively a bit below (45%) half of the enrolled students passed the courses in mathematics and physics. The study was expected to shed some light on whether the workload was the cause of these low numbers.

2 METHODOLOGY

As mentioned above the focus for this study is the *contingencies* that influence the students' experience and the *context of use*. However, it is also a premise in this study that motivation is important to students' use of an LMS; the system is new to first year students and they have to learn how to use it – along with everything else they have to learn. Hence, Professor Vincent Tinto's model (explained below) of motivation and persistence (Tinto, 2017) is applied in the analysis in order to make an overall categorization and identify the relevant contingencies.

2.1 Situated action the context of use

The authors take inspiration from the field of *workplace studies* and the *situated action* approach (Button & Sharrock, 2009). Button & Sharrock argue that all work is *situated*. That is, it takes place within a *swarm of contingencies* (Button & Sharrock, 2009, p. 76). How people work is, in part, constituted in how they are handling these contingencies. According to Button and Sharrock, the nature of the context can be seen from how people are doing their work, and just how they are invoking context. In this study, we are exploring how the students in this way define the relevant context and the contingencies that influence the students' thinking and action.

2.2 Vincent Tinto's model of motivation and persistence

Professor Vincent Tinto (Tinto, 2017, p. 254-255) argues that universities should take the student perspective in order to understand what makes student persist and complete their studies – as opposed to dropout or retention, which usually is the focus of institutions.

According to Tinto, the key to persistence is motivation, which, in this context, can be strengthened or weakened by the three elements of *self-efficacy*, *sense of belonging* and *perception of curriculum* – as illustrated in Figure 1.

Self-Efficacy

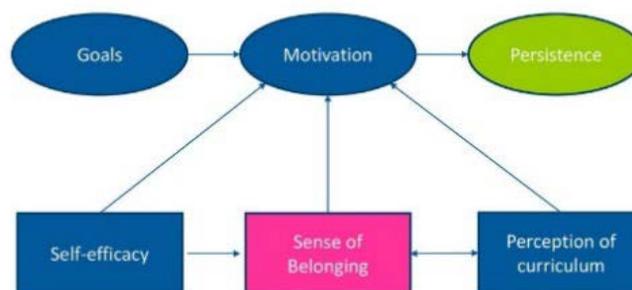
Self-efficacy can be defined as a person's belief in own ability to succeed in a specific situation or at a specific task. "Sense of self-efficacy

influences, in turn, how a person addresses goals, tasks, and challenges. A strong sense of self-efficacy promotes goal attainment. Persons with high self-efficacy will engage more readily in a task, expend more effort, and persist longer in the completion of that task and do so even when they encounter difficulties. Conversely, a weak sense of self-efficacy tends to undermine achievement." (Tinto, 2017, p. 257).

Sense of belonging

Students' sense of belonging is shaped by the campus climate and the perceptions of belonging students form by their continuous interactions with fellow students, faculty, staff, and administrators on campus. "Students who perceive themselves as belonging are more likely to persist.[...] (Tinto, 2017, p. 258). By contrast, a student's sense of not belonging, of being out of place, leads to withdrawal from contact that further undermines motivation to persist." (Tinto, 2017, p. 258).

A theory of motivation and persistence



A model of student motivation and persistence (Tinto 2015)

Figure 1: Vincent Tinto's model of motivation and persistence

Perception of curriculum

Students' perception of the value and relevance of their studies also influence their motivation. Students' perceptions of the quality of the curriculum and its relevance are of key importance for student motivation. "Perceptions of the quality and relevance of the curriculum reflect a complex interplay among a variety of issues including faculty teaching methods, perceived institutional quality, and student learning style preferences and values." (Tinto, 2017, p. 259) Students must perceive that the material to be learned is of sufficient quality for them to spend their time and effort on. The learning tasks must make sense and be meaningful. Only then will students be motivated to engage in the learning tasks and persist. If students perceive the curriculum and/or learning tasks as unrewarding, irrelevant, or of low quality, their motivation will be weakened (Tinto, 2017, p. 259, Illeris, 1999, p. 174).

2.3 Method and research design

Two focus group interviews were carried out. One group with four students and another group with five students. The focus group is a qualitative method that allows researchers to produce data about the interpretations, interactions and norms of social groups in discussions facilitated by a moderator (Halkier, 2016, s.13).

This method does not produce results that are representative, but that is not the point either. In this study the aim was to begin to form an understanding of the student experience and to learn which questions would be relevant to ask in the next part of the study.

The themes students were interviewed about were:

- 1) Their study behavior, challenges, and habits
- 2) Their learning process and outcome and
- 3) Their use of resources (e.g., textbooks, video tutorials, lectures, group work, and material on the LMS) when studying

The recorded interviews were transcribed, anonymized and analyzed in accordance with Tinto's three categories of self-efficacy, sense of belonging, and perception of curriculum. Inspired by the aforementioned situated action approach, we furthermore analyzed how the participants oriented themselves toward their context. As the participants are enrolled in courses that one of the authors (K. From) is currently teaching, From did not participate in the focus group interviews as this might prevent the participants from speaking their mind about these courses. From did, however, participate in the analysis of the anonymized transcripts of the interviews.

3 RESULTS

3.1 Key findings

Our most significant empirical findings are:

- In general, the students' *self-efficacy* seems to be under pressure: Especially the workload and the difficulties of balancing work and life seem to be stressful for the students.

- The student seem to have a strong *sense of belonging*.
- The students' *perception of curriculum* seems to be negatively influenced by confusion about the meaning of several courses and how the courses in their programme are interconnected.
- For these first year students *the context of use* and relevant *contingencies* seems to include the aforementioned stress and confusion related to workload and studying. However, the transition from being a high school student living at home with mum and dad to being a university student living alone is stressful and difficult to handle. Workload, social life, cooking and doing the dishes – that is, *student life* in its whole, seems to be included in the *context of use*.

The findings are presented in more detail below. All quotes are translated from Danish.

3.2 Key findings: Self-efficacy

A general trend in the two groups are that the students are overwhelmed by the workload:

"It was a lot of things. There was the weekly mathematics home assignment, the weekly reflective report. There was a lot of theory to read in some of the courses. I had a really hard time structuring [everything]" (P1, #1 p. 8)

The following student has postponed a course:

"[...] I did for example choose to postpone the mathematics course until next semester, because I didn't feel I had the time to do everything [...] otherwise I would not make it to the end of the semester." (P4, #1 p. 11)

One of the students is feeling the need for some advice:

"I would like to have someone teach me how to organize my time outside of class, because there's a huge difference between living at home and going to high school and living in a dorm and now having to cook, and study and do assignments, and then also having a social life" (P4, #1 p. 10)

Another student also talks about balancing studying and housework:

"When you finally have some time off you really want to relax but you can't, because you haven't done the dishes for a week, because you haven't had the time. It's your time off, but you are washing up, and then you need to sleep, because tomorrow you have to start all over again." (P4, #2 p. 3)

Some of the students seemed to be very much affected by the amount of pressure:

"I was falling into a black whole [mentally] because of the amount of work. It's like you're bombarded from five different courses and social events, and you have to make it all work." (P5, #1 p. 11)

Another student made a similar statement:

"I had a mental breakdown over the winter holiday, and when I had to go back, I thought 'phew!'" (P2, #2 p. 22)

One student talks about the whole experience of the first year as being demotivating:

“I just think it’s a shame that the first year is so demotivating. I’ve talked to others that feel the same way. They feel demotivated by several courses because they can’t keep up with everything. Maybe I’m lucky that I can force myself through things” (P4, #2 s. 4)

Notably, this student concludes that the whole of the first year is demotivating because of the workload.

3.3 Key findings: Sense of belonging

The participants in both focus groups seemed to have a strong sense of belonging. This student explain what it means to them:

“It is super motivating to be part of a group of students so we don’t have to study alone all the time. Taking classes with people you know make you more motivated and you have more friends to see”. (P1, #1, p. 26)

Similar, another student said:

“ [...] I don’t know how I would get through university without a social network. It comforts me when I sit alone and read a text that I don’t want to read, that someone else probably thinks it even worse than I do. And then I can go on reading for a bit longer”. (P4, #1 p. 29)

3.4 Key findings: Perception of curriculum

In general, the students expressed confusion and doubt about the meaning of some of their first term courses. Furthermore, the students found it difficult to understand how the first term courses are connected to the other courses in their educational programme:

“And I think it’s the same with mathematics, when we graduate we are done with mathematics”. (P1, #1, p. 17)

One of the students have learnt from an older student that part of the curriculum only is relevant to some engineering students in a different programme than theirs:

“And he did actually say that things like complex numbers is something that electrical engineers use, but he had never needed it himself. [...] That was demotivating, because that means I have to struggle with complex numbers and I’ll never use them. That is just such a mega waste of time”. (P1, #2, p.13)

This story seems to be indeed very demotivating for the students.

4 SUMMARY

The context and contingencies which the interviewed students orient themselves towards seem to include a heavy workload and severe difficulties balancing work and social life. For some students this leads to a “mental breakdown”, falling “into a black hole”, or the pressure makes them postpone one or more courses and exams. Furthermore, the pressure is a severe threat to their *self-efficacy*. In general, the interviewed students seems to be somewhat confused about the relevance of some of

their first term courses. Thus, the relevance of the mathematics course and specific – more theoretical and academic – topics seem to affect their *perception of curriculum* in a negative and demotivating way.

However, the students seem to have a very strong *sense of belonging* because of the social network they formed in their first year. This strong sense of belonging seems to motivate them and help them carry on and, hopefully, persist.

Although Vincent Tinto's model of motivation does not include the whole of student life – the interviewed students seem to orient and concern themselves towards cooking, doing dishes, and social activities in their spare time. Thus, it is necessary to consider these activities as part of the *context of use*, because these activities, and, in a broader sense, the transition from being a high-school student living at home with mum and dad to living alone and being a higher education student, seems to be of great importance for the students and for their (new) life.

5 FURTHER RESEARCH

It is important to consider the context of use in the next part of the study which will have a more narrow focus on the students' use of the LMS and the LMS' scaffolding nature with respect to student motivation and learning. It is well-known that stress can affect cognitive performance including memory (Sandi, 2013, 245) and a lack of motivation is also likely to affect the time and effort students will spend learning to use the LMS. If, however, there is a strong sense of belonging among these students, this may prove to be a resource that teachers can tap into – perhaps by enhancing social aspects of scaffolding via the LMS.

Obviously, two focus group interviews with a total of nine students cannot tell us if our results are, in fact, general trends. This was, however, never the point. Merely, the point was to identify relevant themes to investigate further in the next part of the study, and which relevant contingencies can be observed to influence the students' use of the LMS.

Thus, the following questions need to be explored further:

- Is it a general trend that the students in this educational programme feel overwhelmed and stressed about the workload?
- Is it a general trend that students in this educational programme have a negative perception of the meaning of parts of the curriculum?
- Is it a general trend that students in this educational programme have a strong sense of belonging?
- Is it a general trend that the *context of use* includes aspects of student life as a whole?
- If so, how do these trends influence the students' use of the LMS, and could a sense of belonging be a resource for teachers?

As well as the main question:

- In which ways does the LMS and the content scaffold the students' learning process?

The starting point for this study was a desire to use the new learning management system at DTU to scaffold and enhance student learning. This study has shown that students indeed seem to face a number of challenges as first year students in an educational programme at DTU. These observations will be valuable in further research on the learning of engineering students in order to develop the educational programme and the use of the LMS for scaffolding and support of the students in their transition from high-school pupils to students at DTU.

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