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# Framework for pupil-to-student transition, learning environment and semester start for first-year students.

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**Abstract.** For several years, the Department of Informatics at the University of Oslo has welcomed large student groups: over 450 new students at the start of studies in August, divided into five study programmes. This is a demanding job involving many people and challenges with coordination of information. Over the past three years, we have worked systematically on various measures to promote a good learning environment for students throughout their first year. In this paper, we present a framework that has evolved through several years of work on semester startup and other measures during the first year of study. Using an evaluation form and interviews through several semesters, we have collected data for semester startup. We highlight in what way the measures contribute to 1) increased collaboration among students, 2) improving study progress and 3) reduced drop-out.

**Keywords:** first year student · semester start · learning environment · mentor week · programme seminar · pre-course · pupil-to-student transition.

## 1 Introduction

For many students, the transition from high school to university is challenging. Both in Norway and internationally, there is a great interest in pupil-to-student transition [1, 2], and the first-year experience (FYE). Both the experiences the students have through their first year of study and the experiences they receive from student reception during their first few days are important for academic achievement. The literature describes many challenges, including encountering a new social environment, misunderstandings regarding study requirements and high work pressure [3–6]. The research highlights the importance of a combination of various academic and social activities that support students' dedication to the subject-specific approach to knowledge as well as their preparation for new role as a student in higher education. A holistic approach that supports academic, social and emotional measures is what seems to be beneficial for a good learning environment [7, 8].

Interaction and social belonging are important for learning. [9] claims that the amount of interaction with fellow students has far-reaching effects in almost every aspect of the learning environment, student learning and personal development. [10] conclude that creating space and opportunities for students to be able to interact with the subject teacher and to get to know fellow students is a powerful tool to promote student

affiliation and sense of mastery. [11] emphasise social and cultural factors in student transition, and focus in particular on colloquium groups as an approach that promotes learning while also providing increased motivation for study. [12] show that students who spend too little time studying often find alternative strategies for passing courses with less focus on achieving learning outcomes [13–15]

The learning process includes phases of confusion and disorientation [16] and, accordingly, care should be taken to prevent first-year students from being left alone with their challenges. New students may lack the meta-cognition needed to reflect on their own knowledge, skills and working methods; thus, misunderstanding may potentially hinder further study [17].

For several years, the Department of Informatics at the University of Oslo has welcomed large student groups: over 450 students, organised in five study programmes<sup>1</sup> from 2017 and in four study programmes in previous years. Receiving many students is a demanding task which involves many people and the coordination of much information. Over the past three years, we have worked systematically on various measures to promote a good learning environment for students throughout their first year. We have involved students in this process through collecting data using evaluation forms and interviews. In this paper, we present a framework and a number of measures that are perceived by the students as motivational and learning-enhancing.

This paper is organised as follows: in Section 2 we describe the work process and framework. The method we have used to obtain the results is presented in Section 3. The paper concludes with results and a discussion in Section 4.

## 2 Work process, measures and framework

The work to establish a good learning environment is a continuous process throughout the first year. In recent years, we have worked systematically on various measures through the students' first year of study. Our experiences have been gathered systematically to form a framework for future years. The preparation of this framework has been ongoing work over several years, which has mainly been achieved by utilising data collected through surveys and interviews with students. There are several motivations for having such a framework, especially the need for information flow to all parties involved, which are: departmental management, study administration, academic staff, subject teachers, tutors, students and technical administrative staff. There are up to 750 people to be simultaneously coordinated and provided with information. Such a tool for project planning provides good opportunities for co-writing and sharing across the organisation.

There are several activities that are carried out in relation to the learning environment, but in this paper we will only include the activities that the department arranges. Hence, we will discuss the following work processes:

- The design process

<sup>1</sup> The five study programmes are: (1) design, use and interaction, (2) digital economy and management, (3) programming and system architecture, (4) robotics and intelligent systems and (5) language technology

- Start of studies and student reception
- Pre-course
- Programme seminar

## 2.1 The design process

The framework is highly valuable in the design process. Using a timeline provides valuable coordination of the various tasks. All tasks are based on a model of coordination and mutual dependence, making it easy to keep track of progress. The planning starts in February, when all the key players – the study administration and the tutors – meet for a joint exchange of experiences from previous year. In this meeting, any changes and new actions will also be discussed. After this meeting, all parties have a common outline for this year's plan; especially important are the start of the semester and student reception. We will not go through the framework's 26 parts with sub-items in detail, but will highlight the most important elements in the following sub-sections.

## 2.2 Start of studies and student reception

The most important action is the programme for the semester start, which consists of a number of activities to facilitate a good learning environment. The focus is the first week in the autumn semester – one week prior to the first lectures. Previously, this week has been called the tutor week, but the name has been changed to reflect the fact that the week contains more than just tutor activities. It is important to promote the academic content of the week and the interaction with social events. In order to create a good synergy and collaboration between the different stakeholders, the first week is carefully planned in terms of both the social events, which are organised by the tutors, and the academic events, which are organised by the department. Student reception at the start of the week involves all new students attending an opening ceremony (35 minutes). In order to strengthen the affiliation to the department, it is important to have an auditorium that is large enough to accommodate all students, but at the same time it is important to organise it so that local affiliation for each study programme is achieved. Figure 1 shows an example where the students are organised into different seating areas for each programme.

In the opening ceremony, the department's management and the leader of the tutors welcome the students, which also reinforces the connection between academic and social aspects of both the study start week and the rest of the semester. Next, the students get a professional presentation on what informatics is; this is done in order to reinforce the students' awareness and confirmation of what they will study in the next few years. A brief presentation of some important deadlines from the administration team helps to emphasise the students' responsibility for their own learning. The ceremony concludes with a pep-talk which gives students confirmation that they have made the right choice and initiates the process of helping increase students' pride in their study.

After the opening ceremony, the students follow the programme council leader for the study they are admitted to. To strengthen the social aspect, we have chosen to include the tutors as early as possible. Already when the students leave the auditorium, all the tutors are ready to mingle with the students in the respective study programmes.

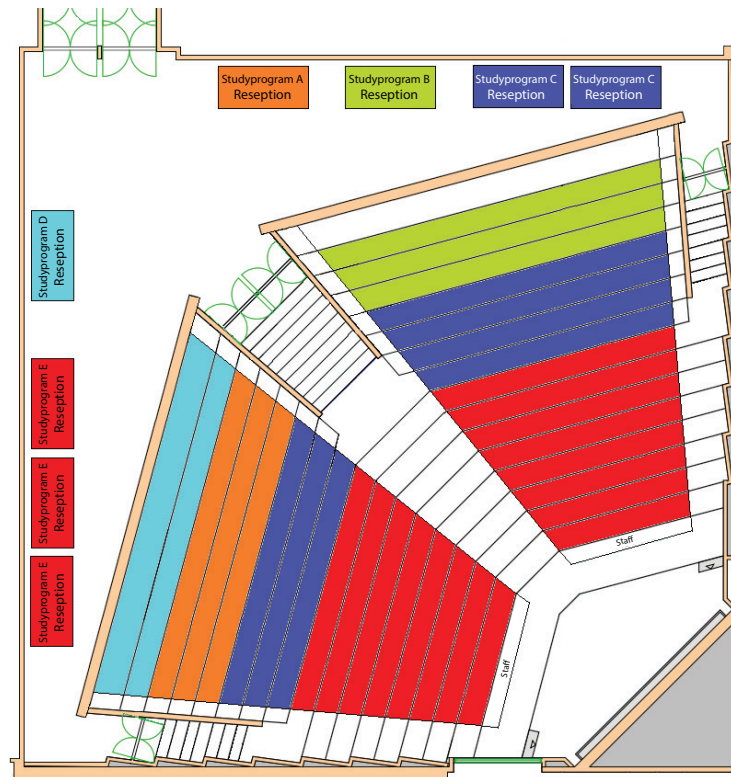


Fig. 1: The distribution and the collection of students in the auditorium for the respective study programmes.

Figure 2 illustrates how the tutors stand in a column and merge with the students as they exit the auditorium; it is very important that this is organised specifically so that all actors are informed – especially since there are over 100 tutors. A tutor meeting is held one week in advance, where this is clarified and the details shown in Figure 2 are reviewed. The next part of the agenda involves programme-specific events that mainly give the students more detailed information and motivation for the study programme they have chosen. Here, there will also be information from more experienced students in the programme including their recommendations for obtaining good study habits. Before lunch, the students will receive a challenge: they should greet each other while sorting themselves alphabetically by name. It is a simple kind of team-building method, and in addition to approaching each other, they get a practical experience of a sorting algorithm. This algorithm is reinforced and used in the lectures during the programming topics. Once the students are sorted by name, they are personally handed a citizen certificate from the programme council leader. This citizen's certificate is proof that they have been admitted to the study programme with the university's seal, which also helps to strengthen the sense of pride and identity.

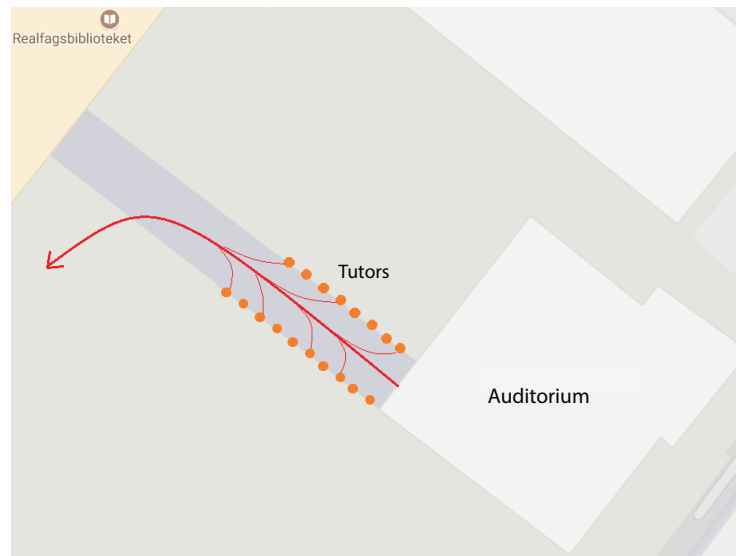


Fig. 2: The tutors (mentors) are located in a column outside the auditorium that all the new students attend after the ceremony. The tutors will continuously mix with the student group and help to promote interaction among the students.

*'It is wonderful to get a citizenship letter.'*

(Student #nor18-2-15)

Q: 1

The department serves lunch to all new students, tutors and teachers with the objective of creating a space for socialisation. The tutors gather their participants in groups during lunch, and the tutors have their own activities for socialising during the lunchtime. After lunch, students meet in their respective study programmes and receive a review of expectations to confirm and/or reject their own expectations. The first day ends with a joint departure to the official welcome ceremony of the university arranged by the university management.

During the following days there are various activities that are organised by both the tutors and the administration. Figure 3 shows a concrete overview of how the first week of the year is organised.

### 2.3 Pre-course

The first pre-course at the department was given in 1997. At the end of the 1990s, many started the computer science programme without any prior experience of using a computer, and this was especially true of the girls. The purpose of the course was therefore to give inexperienced students, both boys and girls, practical experience in using

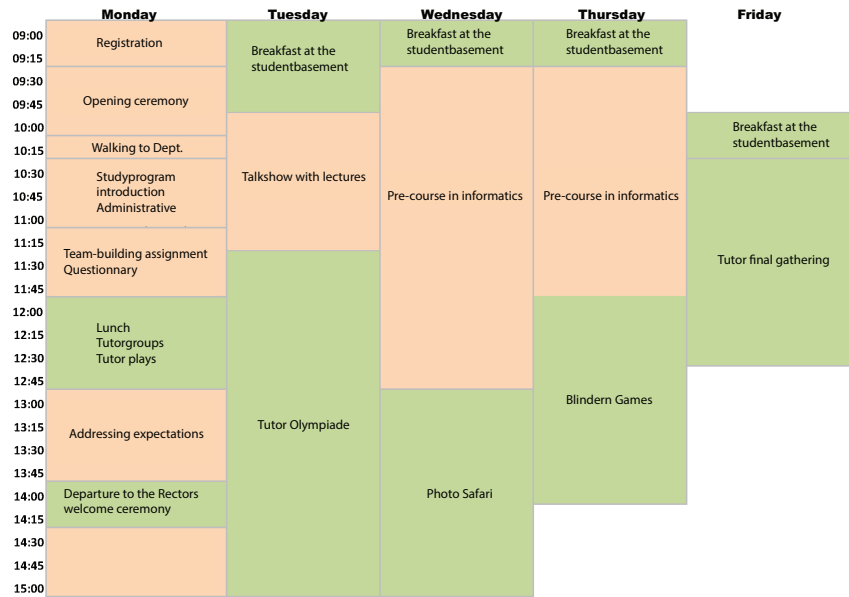


Fig. 3: Time schedule for the study start. The orange blocks represent the department's 'ownership', and the green ones are run by the tutors. .

computers. A teacher talked about how to use computers and the student association provided practical training by creating tasks and providing guidance. The course was a great success and has been given every year since.

The content of the course has changed over the years. Today, all new students are somewhat experienced computer users, but very few have knowledge of, for example, the Linux operating system, which is widely used at the department and throughout the study programme. The focus of the course is therefore to prepare the students for the challenges they will meet in the coming semester: computers with both Windows and Linux, suitable software to use their own computer, connection to the university's computer network, practical problems around user accounts, use of e-mail, course information, etc. The student organisation at the department is responsible for the preparation and revision of the exercises and tasks used in the course.

## 2.4 Programme seminar

A few weeks into the semester, the department, in collaboration with the faculty, arranges a programme seminar for all new Bachelor students in computer science. This programme seminar is organised in collaboration with a suitable conference hotel. The programme seminar serves as a continuation of the study programme, with a focus on both professional and social well-being. The new students get the opportunity to get to



know their fellow students better, through a practical exercise, the *Diversity Icebreaker*<sup>2</sup> where they learn more about themselves and their preferences and get inspiration for the study programme they attend. Study technique, motivation and clarification of expectations are central topics at the seminar, and through exercises the students gain deeper knowledge in these aspects. The programme seminar is not compulsory but highly recommended, and all costs are covered by the department; the seminar is alcohol-free. It is organised so that the ordinary lectures that the students should have attended on these two days are either postponed or moved to the conference hotel. In practice, joint transport for both students and subject teachers laid on by the faculty, which organises, coordinates and manages the programme seminars.

### 3 Method

In order to evaluate the actions, in this paper we consider students admitted to the Department of Informatics for autumn 2017, where a total of 499 students attended the first day of study. Figure 4 shows an overview of students and gender for the five study programmes.

During the first week of study, 40 of the students were selected at random and interviewed by a student assistant employed by the department. However, many of the aspects of interest, e.g. well-being or drop-out, require implementation in several semesters before major results can be generated. We therefore supplement the analysis of the 2017 students with a result from the well-being and learning environment survey conducted in the spring of 2017 for the students who started in the autumn of 2016.

A well-being and learning environment survey was carried out in 2017 for the first time. The survey was published after the Easter holiday. The response rate was 18% (n = 87) of the 462 students who were invited to respond to the survey. The students responded to the survey in one of two ways: anonymously (n = 40) or as part of a continuous research study where we follow students throughout the entire study period and into working life (n = 47). The questions dealt with students' degree of participation in the programme seminar, the study start and whether they considered themselves an active student or non-active student. They were also asked about general well-being aspects in addition to several questions from the larger and periodically conducted national surveys such as Vilje-con-valg [18], the Shot survey [19] and the Studiebarometeret<sup>3</sup>.

During the autumn semester of 2017, 40 qualitative interviews were conducted with the students. The interviews were conducted by the same person throughout the first week, and the main purpose was to examine in more detail the results from the survey conducted from last year's student group.

### 4 Results and discussion

Participation in the study start programme could be answered as 'no' (n = 11), 'yes, partly' (n = 28) or 'yes' (n = 47). Significant differences between the groups showed that

<sup>2</sup> <https://diversityicebreaker.com/>

<sup>3</sup> <https://www.nokut.no/studiebarometeret/>

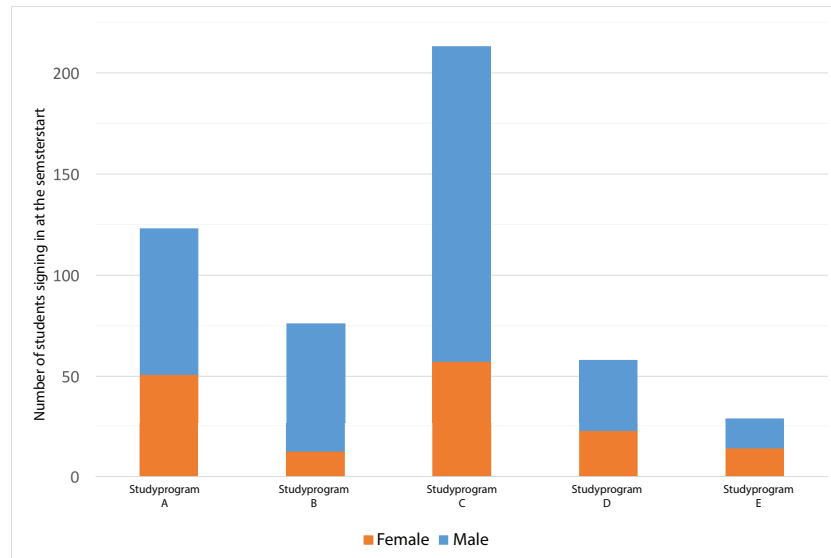


Fig. 4: Overview of the number of students who attended the first day of study, and distribution over the associated study programmes broken down by gender.

those who did not attend the study startup reported a higher percentage of study time spent outside the department (42%) than the other groups, while those who participated ('yes') had a higher proportion of time spent on self-study at the department (22%). Students who spend too little time and effort studying often find alternative strategies to pass topics other than achieving learning outcomes [12]. Those who participated in the study start programme also participated in the programme seminar to a greater extent. Many students commented on having a high degree of satisfaction with the programme seminar and on seeing its importance.

*'The seminar at Sundvollen (ed. Programme seminar) was very good for linking social ties – just as good, if not better, than semester start.'*  
(Student #sh12-9-3)

Q: 2

Participants were asked whether they had a positive or negative experience of the reception ( $n = 79$ ). Only 5% ( $n = 4$ ) responded negatively ('no'), but common for these students was that they also reported significantly lower degree of general well-being, study progress this semester, satisfaction with the tutor scheme and satisfaction with the social student environment. None of those who answered 'no' used quiet reading rooms, which would also substantiate that they did not participate in the learning environment. The tutors play a central role in the students' experience of the first day, especially in the coordination of academic and social aspects. The student quotes below emphasise the tutor's contributions.

*'The study start week was very helpful for me to get to know other students, and I was well received.'* Q: 3  
(Student #sh12-8-5)

*'The tutors were very kind and willing to answer questions about studies and help if needed.'* Q: 4  
(Student #sh12-9-1)

*'Good tutors who influenced how well you got to know the other new students.'* Q: 5  
(Student #sh12-8-2)

As a consequence of not feeling well received, students may choose not to participate in the environment of the study programme, which in turn leads to the fact that they spend more time outside the department during the following semester.

A total of 79% of the students reported that they participated in the programme seminar. In addition to reporting that they had more friends and better study progression in this and the previous semester, they also reported a higher proportion of time spent on lectures and group lessons (30%) than those who responded 'no' or 'yes, partial' (20%) on this question (n = 17). Lecturers in the first-semester courses experience a significant change in student participation before and after the programme seminar. They reported higher levels of student activity and engagement in both lectures and group teaching. As the student statement below expresses, it is important to organise students into student groups for a good learning environment.

*'The programme seminar really helped to get friends and people you could work with.'* Q: 6  
(Student #sh12-10-2)

The level of satisfaction was investigated using eight aspects from the Study Barometer<sup>4</sup>. Satisfaction was examined on a specific scale where the endpoints 'not satisfied' and 'very satisfied' are coded as 1 and 5, respectively. By using numbers from Computer Education for 2016 as a comparison, it appears that overall satisfaction was about the same as for the Study Barometer for social student environment, environment between academic staff and students, academic environment among students, equipment and aids in teaching, and administration. However, somewhat higher satisfaction than in the Study Barometer was reported for premises for teaching and study work, library and ICT services.

The overall results show that experiencing pleasure in studying computer science and a high degree of security in this choice are significant factors for well-being. Social conditions, such as satisfaction with the student environment and many friends at the

<sup>4</sup> <https://www.nokut.no/studiebarometeret/>

study centre, also seem to help increase overall satisfaction. Unclear expectations of the individual student appear to be the main reason for lower well-being.

Overall, there is also an indication that some students reported a higher degree of expected satisfaction from completing the programme combined with a higher degree of anxiety of failing to perform on the programme, compared to other computer science programmes. Such concerns, and similar factors such as unclear expectations, seem to be present to a greater extent for those who answered anonymously on the survey. Further work will therefore be needed to compare the performance of those participating in the continuous study with those who did not participate to reveal whether or not the strongest students are generally over-represented on such studies.

In this paper, we have presented the main features of a framework for a good study commencement, which can be exploited to facilitate an engaging and inclusive learning environment for first-year students at the Department of Informatics at the University of Oslo. This project will be continued, and more qualitative studies will be provided to support the preliminary results. Cooperation and exchange of experience at local and national level is also desirable.

The underlying research methodology is based on both quantitative and qualitative methods, however the sampling rate and the number of participants are relatively low related to the total number of students ( $n > 500$ ) eligible. Generally, it is quite difficult to obtain high  $n$  when it comes to involve students and to get their responses. The qualitative interviews are conducted with structured questions and are based on the quantitative results from previous years. One might argue that the sample size is small, but to our defence the qualitative interviews have been quite unanimous on several topics.

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