Students Envisioning the Future

Thomas Lind,
Åsa Cajander,
Bengt Sandblad &
Mats Daniels
Dept. of IT
Uppsala University
Uppsala, Sweden

Marta Lárusdóttir
School of Computer
Science
Reykjavik University
Reykjavik, Iceland

Roger McDermott
School of Computing
Science and Digital
Media
The Robert Gordon
University
Aberdeen, Scotland

Tony Clear
Faculty of Design &
Creative Technologies
Auckland University of
Technology
Auckland, New Zealand

Abstract—**How can students be included as critical stakeholders in the systems and services provided by a university? To address the whole student experience, we engaged students and employees at a large Swedish university in a vision seminar process to elicit how these groups envisioned an ideal future university, and the necessary changes to technology and organisational structures required to achieve this ideal version. The process entailed six four-hour workshops with four groups consisting of six participants each. A survey instrument was used to follow up on the participants' experiences of participating in the vision seminar process and their thoughts on the future of the university. The results show that the participating students were more positive compared to the university employees. The students envisioned harmonized interdepartmental systems, seamlessly integrating a variety of services into one university-provided solution. The employees envisioned their future work as flexible, enabled by technology providing excellent support without hindering pedagogical and organisational development. Using technological frames, these visions of the future are identified, analysed and discussed in relation to the quality of university education and a holistic view on students' university experience. Finally we discuss the broader implications of the visions on the future of university education.**

Keywords—student experience; vision seminars; futures; participatory design; technological frames; student information systems; student record administration

I. INTRODUCTION

Some argue that the amount of administrative and managerial tasks is increasing throughout all areas of society, leaving virtually all categories of professionals to do more administration than ever before [1-2]. Tertiary education is no exception to this. For students, tangible aspects of study administration includes tasks such as registering at the university, applying and registering for courses, requesting transfers of study records and signing up for exams. This aspect of student life is not often discussed, even though it is becoming an increasingly important part of being a student as we move into an era where services are provided that enable students to handle their study administration online to a greater extent than before. When students increasingly become the administrators of their own studies, this aspect of the wider student experience grows more prominent and thus questions

such as how the students can be included as critical stakeholders in the systems and services provided by a university will warrant more attention. Indeed, definitions of educational quality, in which it is asserted that the whole student experience in tertiary education setting needs to be taken into account, have been around for quite some time [3]. In this paper we report on a study addressing how, as an element of institutional democracy, students can be included as critical stakeholders in the systems and services that a university provides, and how insights from the computing disciplines can inform this discussion.

Study administration is handled to some extent by nearly all university employees involved in teaching, including program coordinators, heads of studies, teachers and teaching assistants. At most of the universities and colleges in Sweden this is done using separate installations of the same Student Information System (SIS), which, in this paper, we will refer to as System L. The development of the next generation of this system is currently ranked as one of the largest IT projects in Sweden, with a software development budget of around 34 million euros. Technology-wise it makes the leap from having one locally installed and managed instance in each university to one centrally installed, nationwide instance catering to all 37 participating universities and colleges, plus a handful of government agencies. From a user perspective there will be changes made in the division of work, where both teachers and students will be expected to do more tasks related to study administration themselves. The size and scope of this transformation qualifies it as a high risk endeavour, and with the planned changes affecting all the students enrolled at these universities and every employee involved in teaching, or the administration thereof, the associated challenges are both numerous and considerable.

Introducing new information systems in organisations is generally considered to be a complex undertaking where the success rate of software development projects of similar size as System L's is historically low [4]. After being launched, information systems frequently turn out to be difficult to use, inefficient and do not deliver the expected benefits (see e.g. DeLone and McLean [5], [6]). In all projects, especially IT projects, one of the major challenges faced by the person in charge is to manage the change process [4], [7]. In this regard,

one of the success factors which characterises more effective decision-making processes with respect to the development of a student management systems like System L, is an ongoing dialogue with affected parties [8].

It is a common observation that information systems are integrated into both our work and our leisure time in many different ways and affect us almost wherever we go. An information system can, for example, enforce adherence to hierarchies and bureaucracy, affect established work procedures and, by extension, the shaping of professional identities in a workforce (see for example [9]). Moreover, as they have increasingly become an intrinsic part of our work environment [10], information systems are likely to cause unhealthy amounts of stress if they do not support us effectively and enable us to work efficiently. Given this relationship between the environment in which information systems are implemented and the work they are designed to enable and support, it is surprising that many organisations still make the mistake of regarding their development and introduction as primarily an IT project, rather than an organisational change project.

One of the many problems when introducing new IT systems is the lack of a clear vision that links a description of user needs with the requirements these needs impose on the system [11], [12]. The problem caused by the lack of such a vision is, unfortunately, aggravated by the currently dominant systems development process, Scrum [13]. Studies have found that users are only included during the development process for the purpose of giving informal feedback, and they are seldom offered the time and scaffolding needed to successfully express their ideas and needs [14]. As the definition of success when implementing information systems is inherently ambiguous and open for interpretation [15], the importance of understanding who receives the benefits of the system being considered and how different users and stakeholders are taken into account cannot be stressed enough [5], [6]. This is a core concern of the vision seminar process applied in this study, which is designed to support stakeholders in creating this understanding.

There are numerous studies of students' use of both eLearning systems and more general technology as a part of their courses (e.g. Daniels et al. [16] on the use of collaborative technologies in global engineering). However, research from the early 2000's concludes that there are few studies of Student Information Systems or Students Management Information Systems [17], [18], and we find that this is still the case 15 years later. Gemmell and Pagano [17] performed a post-implementation evaluation of a student information system in the UK higher education sector, while Carcary [18] did an post evaluation and review of the implementation of a Student Management Information System at Limerick Institute of Technology. Later, Carcary proposed guidelines on how to address the misalignment between 5 cases of student administration systems and the stakeholders' requirements [8], which stressed that the stakeholders need to be involved. In these cases the stakeholders include senior management responsible for academic policy decisions and the administrative staff who are considered primary users of the system. The student perspective, however, was not taken into account in any of the evaluations covered by these studies.
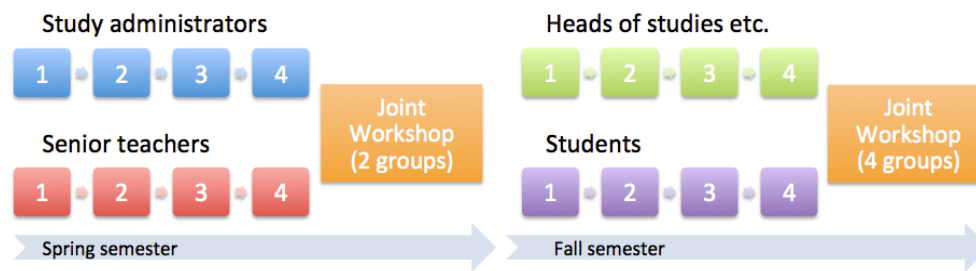
Further, as Rowland and Gieryn [19] discuss, the practical impossibility of producing an exact and complete formalization of stakeholder needs and requirements render the use of traditional up front requirements elicitation approaches problematic at best. To take the students' perspective into account in this context, or the perspective of any stakeholder for that matter, therefore necessarily translates into actively involving them throughout the whole process of technical and organizational transformation.

This paper presents how students and employees at the university envision their future, taken to mean four years hence, if ideally supported by technology and organisational structures. The method used to produce these visions (the vision seminar process) has previously been used in numerous other contexts, such as health care, industrial process control and train traffic control (see, for example, [10-11]), over a period of more than 20 years. One of the outputs of the vision seminar process is a series of documents containing user stories or "scenarios" told by user representatives from different stakeholders. The main contribution of the paper lies in presenting thick descriptions of how students and employees at the university see their future when it comes to study administration, a discussion of how these visions of the future correlate to each other, and an exemplification of the use of such visions for improving education quality by addressing the whole student experience.

Of relevance to our study is Orlikowski's concept of Technological Frames [20], as it can be used to analyse different users interpretations of IT and how these guide them to make sense of a situation and take action. In brief, a user's technological frame is a result of the user's underlying assumptions, expectations and knowledge about technology and as such it affects the user's appropriation and use of technology while also having implications for its development and implementation. In this study we find that the university employees share a similar technological frame, based, e.g. on their purpose for using IT, the context, their common knowledge base, power relations, and previous experience of similar systems. This differs from the technological frame shared by the students. Orlikowski also proposed the notion of congruence and incongruence when comparing technological frames. Congruent frames are compatible with each other thanks to their structure and content whereas incongruent technological frames have important differences that can be traced back to the users' expectations, assumptions or knowledge about some key aspects of technology that make these frames incompatible. These concepts will be found to be useful in the following work.

The paper is structured as follows. First System L is presented briefly, followed by a short description of the vision seminar process, a summary of the resulting visions of the future, including a scenario authored by the students. Results from a survey distributed to the vision seminar participants are then presented, followed by a discussion of these results and some reflection upon how the visions of students correlate to those of university employees. Finally we conclude the paper with a discussion on the implications of our study for university education.

FIGURE I   THE GROUPS AND WORKSHOP SESSIONS OF THE VISION SEMINAR PROCESS

II.   SYSTEM L

System L will be deployed at 37 universities and colleges in Sweden and is set to have in excess of 500,000 users by the end of 2018. With this user base and a development budget estimated at over 34 million euro it ranks as one of the largest IT development projects in the country at this time.

The system is intended as a nationwide computer-based administration and documentation system for student information, and was developed and owned by a consortium of Swedish universities. It has been designed to facilitate day-to-day administrative activities such as the monitoring of student attendance and study performance, issued degrees, and institutional compliance with legal requirements. The system can be used by all public universities and aims to support decentralised decision-making.

The heart of System L is a "mutual core", implemented identically on all installations [21], which consists of a repository of student records. Each institution that uses the system decides which parts of the core it wishes to access and which additional services it wishes to integrate with the core at a local level. Due to the size of its consortium, System L has become the industry standard for student record systems in Sweden, and the system is used in nearly all universities and colleges in the country.

In addition to its administrative function, System L is also the main interface for institutional reporting to governmental agencies and bodies such as the Ministry of Education, the Student Loan Authority and Statistics Sweden.

III.   THE VISION SEMINAR PROCESS

During the vision seminar process, student and employee representatives met in a series of seminar events. During these seminars, the representatives were guided through a process that scaffolds creative thinking about the future, based on their current understanding of the present. The aim is to use visualisation to create a shared mutual understanding between participants and to imagine what the future work of different users would look like, including organisational aspects, work processes, communications patterns, as well as the need for new or altered IT systems to support this new work. The outcome then is recorded in a "vision document". The results can then be used to make a significant contribution to the requirements elicitation process during systems development by providing a foundation of user needs and constraints. The vision seminar process builds on traditional values associated with participatory design, such as cooperation, curiosity, creativity, empowerment and reflexivity [22].

In the case of the vision seminars for System L, four groups of six participants participated in the process. The first group contained six study administrators, the second contained six senior teachers, the third contained six students, and the fourth contained a mix of six senior staff with experience serving as head of studies, program coordinator, student advisor or similar. Two researchers were present in each group, one mainly charged with facilitating the process and one with documentation. The seminar process was conducted with two groups running in parallel over the course of the spring semester 2014, with the remaining two during the fall semester. After the first series of four vision seminars in the spring there was a joint workshop where the first and second group met and combined their work into a preliminary vision document. After the second series of seminars in the fall of 2014 there was another joint workshop with all four groups resulting in the complete vision document. Figure I is a visualization of this process. In this paper we have chosen to merge senior teachers, heads of studies and study administrators etc. into one category that we call university employees.

The participants were volunteers from different departments at the university, and were not personally reimbursed in any way with the exception of the student group who received cinema ticket vouchers. The process itself was planned and organized by three researchers who, in different configurations of two, conducted the seminars. Each seminar session was either preceded or followed by lunch for the participants and researchers.

Operationally, the vision seminar process consist of the following steps:

1) *Preparation*
2) *Assembling the Work Group(s)*
3) *Seminar Planning*
4) *Realization of the Vision Seminar Process*
5) *Creating Additional Input from Stakeholders through Distribution of the Vision*
6) *Anchor the Results in the Organization through Marketing and Meetings*
7) *Documentation*

During the seminar process the vision of the future work developed in steps. Each group started by identifying problems and limitations with their present work. For the student group "work" was replaced by activities meant to support their learning. The groups then moved on to identifying positive aspects and things found important to keep also in the future. They then worked towards a vision of a future incorporating the positive aspects of today and solving the experienced problems. During the sessions the groups used tools such as affinity diagrams to support their work, an example of which can be seen in Figure II. Over the duration of each group's four seminars the vision grew more and more mature. The time between the seminars, two to three weeks, was important as it gave the participants time to reflect and come up with new ideas and the researchers time to document and analyse the evolving material.

For a full account of how the vision seminar process generally works in practice, see Hardenborg et al. [11]. For further readings about the scientific foundation and contribution of the vision seminar process, see Hardenborg [23].

IV. Visions of The Future

The vision seminar process resulted in the development of a set of needs for the future system as well as some scenarios presenting how students and university employees see the operation of the system on a hypothetically typical day in the year 2018. Below we describe some of the future visions from the participants. We start off by presenting some general views that are shared by all participants before moving on to some of the needs described by the student group. We have also included a short scenario describing the student perspective. Finally we present a summary of the university employee groups' needs and visions of the future.

A. Shared Views

All the participants in the vision seminar process want a completely paperless process, i.e. a digitized workflow. A crucial point is that they do not want any unnecessary steps in the process. Both students and university employees want to remove all routine tasks that are irrelevant for the quality of the education, and they want to lower the amount of administration overall. The participants pointed out that it is crucial that the system supports them while working with student record administration, but does not control them. They want to have the feeling of a "flow", so that they will be able to follow a hypothetical case described from start to finish. All groups want to be able to see clearly where their case is in the overall process, and who is expected to do what. This is necessary to enable the user to see the holistic view and implement functionality such as alerts and reminders.

Common to all groups was an emphasis on the need for a single IT system capable of supporting the various parts of students' educational journeys that would be perceived as a single integrated system. As users they strongly dislike having a large number of different systems. Recent studies of work at the university have shown that many administrators are required to use 15-25 separate computer systems which have

not been properly integrated nor designed to work in unison, leading to a significant reduction in efficiency. The university employees did not want to have to log in and out of different systems, as happens at the moment. This need is echoed by the student group who stressed the importance of a single login process.

B. Important Needs from the Students

From the students' perspective, "study administration" is an almost alien concept as the functions that support this are not distinguished from other study related activities. Students believe that the term "study administration" refers to everything that supports them in being a student. For example, the process of registering for an exam is not seen as something different from uploading a written assignment or access lecture notes. In their scenarios the students did not merely present the study administration duties, but described their life as students. For example students wanted the system to wake them up, so they would have sufficient time to go to the lectures; on the way to the lecture hall students wanted to get information about where to go and after the lecture they wanted to be able to chat with the teacher individually. The system should also include information on housing, so it could tell the students when they can apply for a nice, cheap apartment nearby. Additionally students want the system to tell them about job opportunities when finishing their studies. The student group stated the critical importance of mobile connectivity with a need to integrate the system with other applications such as calendar, email, etc.

Students also want to have some degree of responsibility for their administrative work, and to be in control of the process. This requires systems that are both robust and clear, from which they can receive help when necessary. A key concern is that study administrators must be able to have access

to all relevant information in an integrated manner in order to help students in the best possible way. The students want to be able to receive adequate and correct help.

The students describe the entrance to student life as a critical phase where it is easy to become confused by the variety of educational and administrative demands. New concepts are numerous, and it is easy to become bewildered by, and lose oneself in, the various stages of application, acceptance, admission, registration, account creation, permissions, etc. As our students stated during one of the vision seminar sessions:

"It is the start at the university that is heavy. ... It's always the same questions on the basic courses, no one understands what they are going to do. ... If it is hard for us, it must be almost impossible for someone who is not used to computers."

One reason for this confusion is that processes and IT systems often differ between departments, and to some extent even within departments. The students said that as a new student they wanted to avoid using the study administration systems and instead rely on peers to stay updated. The lack of uniformity applies to almost all the steps in student administration for all the different student groups. Information about what applies in a particular department, or for a specific course, is in many cases inadequate or difficult to find. Teachers can develop their own procedures to administer lectures or provide course materials. This results in an absurd situation where students repeatedly have to learn new ways of finding the course material throughout their program of studies. Nevertheless, there are also examples of good practice, where departments make information available in a clear manner and where teachers coordinate their practices to a reasonable extent. However, this makes the lack of such provision from other departments even more frustrating and incomprehensible to students.

To summarise, students want an easy to use student administration system that they can use for various tasks ranging from getting information about new opportunities for student housing to making sure they are registered for an exam. They also want everything to be digitized and free of extra steps to do their tasks.

C. A Scenario from the Students

One example of how the students described their needs is given below. This is a scenario that the participants worked on together to describe the study administration in 2018. What they refer to as the Student Portal is the university's learning management system and CSN is the acronym of the Swedish student loan authority.

Shortly after breakfast, Lina's mobile phone alerts her to a new notification with a dedicated tune. The sound makes her jump and she immediately recognize what it signifies: there is a new message on the Student Portal. She looks at the notification that reads "New results have been received." The exam has been graded! Nervously she clicks on the Student Portal app. At the top of the page, it says "New Message". She opens the message. Passed! What a relief. Lina ticks the "Send by mail" checkbox and verifies that the pre-filled address is

correct. Hopefully she will have her exam result in the mailbox by tomorrow. She considers clicking "Accept results" right away, but decides that it is best to look at the exam first to see if there are any reasons to ask for a reassessment of the result. That means it will take a few extra days before the results are reported to the CSN, but it does not matter since this is handled quite quickly anyway.

I wonder how the others in the study group did? Lina clicks to enter the study group's dedicated page on the Student Portal. It is located within the course unit, Spanish A, and is easy to access. She writes a message to the others to ask them how they did on the exam.

Lina thinks that the next step is to forward the good news to her mentor. She writes an email from the Student Portal's own webmail page, which she uses because it is easier and better looking than her usual email account accessed via Gmail. She remembers that only a few years ago this was not the case and it was a pain to send emails this way.

In her email to her mentor, she writes "Hooray, exam passed!" and thanks her for all her help during the semester. Without the help of the mentor, this semester would have been much harder. At first Lina was hesitant to apply for a mentor as she had heard that the procedure used to be quite complicated, but when she looked it up she realised that it had become much easier in recent years. Previously, the responsibility had been on the student to get in touch with the student coordinator for disabilities. But when Lina had applied to the university last spring, she simply clicked on the box "Interested in extra support" in the online application form. When she was admitted, she received an email asking what kind of support she was interested in and allowed her to reply through a set of checkbox options. When she answered, she was put in touch with a mentor, a senior student, who was further ahead in Spanish and was good at structuring study time. Together, they planned Lina's course of study and set milestones. Lina remembered how difficult it was to get through high school with ADHD. She had agonised over going to university, but was reassured when she looked at the common website for all universities and realised that it was easy to apply for additional support.

Lina's mobile plays another tune. She picks it up and finds a message from Hakim in her study group, shown as a comment on her own message. He has also passed the exam and suggests lunch at a restaurant by the university to celebrate. Lina replies "Absolutamente amigo!"

In this scenario the students emphasize that the administration of their studies is easy, everything seems to be "one click away" and their vision is that they are using more or less one system for the whole administration process. Similar to this scenario, the use of mobile devices is a dominant and recurring feature in the students' visions of the future, e.g. using their smartphone to do the study administration while eating breakfast or en route to class.

D. Visions from University Employees

The results on the university employees' vision seminar work provide visions from three groups of users: study administrators, educational leaders and teachers.

All participants in the employee groups agreed that study administrators need to have wide-ranging access to the system and the ability to amend data input by other users. Study administrators must also be able to manage and add data for other users. This is especially important in situations where students or teachers need help, for example, if they are inexperienced, visiting or temporarily employed teachers, international students etc.

The study administrators have an important service role and their current function could be compared to that of a spider in its web. Both the group with teachers and the one with educational leaders emphasised that this role must be maintained and strengthened. Since it was clear that the study administrators often provide support to both students and teachers, and were required to answer questions on a wide range of issues, they need significant access to and control over the involved systems and processes.

Study administration must be legally secure and quality assured. An integrated workflow reduces the risk that issues fall between the cracks or that information disappears. Such an integrated workflow would simultaneously create conditions for higher quality work and provide better support for both overview of the process and division of labour. The ability to obtain this kind of system overview of the study administrative process was deemed to be important.

One should note that both the educational leaders and the teachers reacted negatively to the idea of having a new system built upon the concept of "self-service" (user autonomy). Both groups wanted to be able to focus on their professional responsibility, and did not wish to have their workload increased.

V. Evaluation of the Vision Seminar Process

A survey was sent to all participants in the vision seminar groups to gather their opinions on both the process and the resulting vision created by using the method. The survey consisted of 14 statements and asked the participants to indicate to what extent they agreed with the statement. Answers were given on a five point Likert scale with the alternatives "Totally agree" (5), "Highly agree" (4), "Agree partially" (3), "Somewhat disagree" (2) and "Don't agree at all" (1). The participants also had the option not to provide an answer.

Five students and 15 university employees responded, giving a response rate of 83% in both groups. It should be noted that no valid calculations on statistical differences can be conducted on the material since there were insufficient numbers of participants in the groups, but we choose to show the standard deviation to give an indication of the variation in the answers of the participants.

Table 1 show how the students and university employees indicated their agreement with whether the vision seminars helped them view their activities in a wider context, whether it helped them discover new things and whether they believe it will result in tangible improvements.

The results show that the students generally indicated a higher agreement with the statements than the university employees, especially regarding whether the vision seminars could result in tangible improvements. All the students indicated that they highly agreed to the statement that the vision seminars helped them discover how students can be better supported, with no variation in the answers. This trend continued in all the other statements in the survey, the students were on average more positive both to the process of the vision seminars and the vision document outcome compared to the university employees.

VI. Discussion

In this section of the paper we will first discuss the differences and similarities between the visions of the students and those of the university employees. We also discuss the vision of System L in relation to administrative workload and the methods used for answering our research questions, including the limitations and implications of this evaluation of the process. Finally, we widen this discussion to cover the implications of including students as stakeholders in this way and what it may bring in terms of the quality of tertiary education.

A. The Visions from the Students' Perspective

Students want the University's systems to incorporate and take responsibility for all aspects of student life, which is a kind of technological frame that sees technology and life as intertwined and completely connected. They also want to be supported in all the different phases of being a student, starting before actually commencing their studies, during their studies and after their studies. In their visions, the system helped them with questions about housing before they came to Uppsala, scholarships and other funding issues, as well as career advice

TABLE I.   STUDENTS' AND UNIVERSITY EMPLOYEES' OPINION RATINGS

	Students			University employees		
	Statement	Mean (N)	St. Dev.	Statement	Mean (N)	St. Dev.
Holistic view	The vision seminars allowed me to put my studies into a wider context	3,8 (5)	0,48	The vision seminars allowed me to put my work into a wider context	3,6 (15)	1,06
Discovering	The vision seminars helped me discover how students can be better supported	4,0 (5)	0,00	The vision seminars helped me discover a new and better way to do my work	3,0 (13)	1,29
Tangible improvements	The vision seminars can result in tangible improvements of the situation for both new and current students	4,6 (5)	0,55	The vision seminars can result in tangible improvements of my work	3,1 (14)	1,21

when about to finish their studies. It was evident that when arriving at the university they needed much more support than they believe they currently receive. They all perceived the process of becoming a student, and actually being a student, to be utterly confusing experiences aggravated by the administrative systems. This view of the university as a universal provider of services was not brought up by the university employees, and while they saw the need for improving the support for existing services they did not voice any need for a wider range of services for newcomers at the university. The student way of interpreting the role of technology can be seen as a technological frame [20] that is incongruent with that of the university employees that only saw System L as a tool for work.

One noticeable congruence in the technological frames of the university employees and those of students was the extensive use of technology. Notably, the technology discussed was not some work of science fiction but rather existing technology such as digital signing of documents and smartphone apps. Students naturally described these apps as a part of their future visions of being a student, whereas the professionals described them as a way of communicating with the students through text messaging and other communication apps. Students also described their use of social media and chat services as a way of communicating with the university, but this was not mentioned in the university employees' group. It is noteworthy that the students' envisioned a future where the university employees are continuously accessible through text messaging and chat services, and, through this availability, provide a first line support function for the students. This technological frame was not at all a part of the university employees' technological frame.

B. The Visions from the University Employees' Perspective

The professionals' aspect of the vision mainly concerns flexibility; the system must provide excellent support for study administration without forcing or controlling it. The system needs to allow different approaches within an agreed set of limits. Here the technological frame of the technology is that the system must allow freedom, professionalism and flexibility. Moreover, the professionals want to be able to see most of their work with student records as processes, to be able to easily identify the context of the current task. This would facilitate the understanding of the involved student management processes and where the professionals' tasks fit into a certain process. It would also support collaboration within and between professions, meeting hard process deadlines and contributing to higher educational quality with greater levels of service for the students. However, it is also evident that the university employees wanted to protect the level of variation in their current practices of handling administrative information to students, and there is a strong resistance to any form of conformity to a certain specific process. Here there is a clear conflict between the students' need for consistent and uniform practices over the whole university, and the university employees' need to have a very flexible system that supports the current level of variation. This incongruence between the participants' technological frames is likely to create difficulties and conflicts in the future.

C. The Visions in Regards to System L Usage

One of the implications of System L is a change in workload when some of the duties currently performed by study administrators will be reassigned to faculty. Both administrators and faculty are worried about this change and its implications for their work and the quality of teaching. When System L is introduced, faculty will still be expected to perform their teaching duties within the same time frame, but with new administrative tasks added to their workload. However, in the vision of the future, all university employees agreed that the role of student administrators should be that of "God", with the ability to provide expert assistance and service tailored to the needs of faculty, whether it be new or temporary teachers or experienced teachers used to taking care of their own administration. They envisioned a future where they can work much more efficiently, but where the same amount of administrative duties are performed. At the same time we could also see that the university employees envisioned a future where System L enabled them to perform quality revisions, efficiently assure legal compliance, created a more holistic picture thanks to the availability of more information about students, and extracted statistics that most probably will increase the amount of administration even more, resulting in less time for educational development etc.

The study administrators see themselves as providers of service to the students, and it is important for them to do a good job. As a part of this, the study administrators would like to access as much information as possible about the students in order to help them. This information includes study records from other universities with detailed information about the courses the students have taken. It also includes information about what different parts of a given course the student has passed, and what parts are missing. However, despite the good intentions of this suggestion there are privacy laws that regulates the use of information in this way, and it will not be possible to get this holistic overview of all information related to a student in System L without a change in legislation.

D. Limitations and Implications

The methods used to answer the research questions in this study consist of vision seminars and a survey sent out to the participants. One can, of course, discuss how realistic the resulting vision of the future is, and how much it actually reflects the future needs of the students and the university employees. One aspect not covered by the vision seminars in their current form is the needs and vision aspects of minority groups. Even though there were some minority and disability representatives in the study, this area is a weak spot in the vision seminar method. This resonates with a study by Franke and von Hippel's [24], where they found that software developers only provide a few variants of their software systems to address the average needs of users. When user needs vary significantly between the different user groups, this approach could leave many seriously dissatisfied.

The evaluation of the vision seminars show that all four participating groups are very positive about the work and the resulting visions. In their offline comments the participants felt that they are being heard and had developed confidence in the new system. This conforms with research conducted by

Bagozzi and Dholakia [25], where they state that one managerial implication of their studies on user groups shows that engaging different user groups in stating their needs is an important conduit for fostering loyalty and engagement with the software among new and existing users. Their advice to project organizers is to devote significant attention to organizing and facilitating a network of user groups organized around their particular software to take advantage of these effects.

We learned that the group of students was generally more positive than the university employees. This is similar to the findings of Matthing et al. [26], who observed that newer members usually had a stronger motivation to participate in user groups, often driven by some specific personal motive, such as wanting to solve a problem they had encountered when using a piece of software. Our own hypothesis regarding this difference in attitude is that it might be based on the fact that the students did not have previous negative experiences from administrative IT systems. Moreover, they were not accustomed to being asked their opinion and listened to in a structured process such as in this case, and they were indeed very happy about the possibility to participate in the vision seminar process. Another hypothesis regarding the university employees' comparatively negative attitudes is that they to some extent have come to associate the introduction of new IT systems with their potential of enabling additional tasks and responsibilities that are not perceived as core to their role. This can be seen as akin to a managerial "colonisation of the lifeworld of academics" (cf. Myers and Young [27]), and thus as an apt response to the complex reality of the situation faced by the employees.

In assessing and improving education quality, Corder et al. [3] conclude that to achieve enhancement of learning it is important, among other things, to "emphasise the place of feedback from students on their whole environment", "recognise and reward innovation", and to "include regular internal cycles of self-review across all areas of the institute that relate to learning and the total experience of students." We find that the application of a vision seminar process such as the one described in the present case can benefit education quality through its potential to significantly contribute to the improvement of the total student experience. While the students' vision may be considerably different from that of the employees, or, at least, difficult to reconcile for other reasons, it is nonetheless important input to the university's effort to improve education quality.

VII. CONCLUSIONS

To conclude this paper we here summarise the implications of the presented visions for university curricula, teaching and learning at the university and for improving the work situation of university employees as areas in need of further attention:

- There needs to be a discussion about study administration and how we can make it a **more unified process towards the students**.

- There needs to be **better support for new students**, and the administrative systems used need to be adapted

to the fact that most new students do not know how the university systems work when entering the university world.

- There is a need for a discussion and a **process description in terms of work processes, skills, and concepts** for university employees.

- It is necessary to discuss **the amount of administrative work** done by university employees in relation to the quality of education.

- The students' expressed need for university services to be available 24/7 implies that the **university should aim at providing eServices to a higher degree.**

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