

Digitalization of Higher Education from a Student's Point of View

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1. ABSTRACT

The process of digitalization challenges universities worldwide, in particular the universities' IT. Qualitative interviews with students were conducted to gather information on service requirements. Three service categories clearly dominate the students' wishes for IT support: study organization, online literature and software provision. As regards the study organization, a centralized platform granting access to all relevant information and services (e.g. schedule, exam administration, certificates, study progress, contact information) is particularly important. From the students' point of view, IT should enable them to focus on the content of their studies, provide support for organizational problems, and grant easy access to resources, such as literature and software, while at the same time require little effort.

2. BACKGROUND

University IT is challenged by the accelerated process of digitalization in higher education which, among other things, becomes manifest in a pervasive use of information technology for the support of teaching and learning (e.g. time-shifted learning via podcasts, digital materials and annotation or real-time interaction in class) (Brown-Martin & Tavakolian, 2014; Craig, 2016; Hanna, 2016; Hochschulforum Digitalisierung, 2015). This process is often referred to as a revolution (Bischof, Friedrich, Müller, Müller-Eiselt, & Stuckrad; Shark, 2015) or a shift (Biddix, Chung, & Park, 2015). The discussion is partly fueled by companies who, not least in their own interest, see a multitude of possibilities (e.g. Cisco, o.J.). Often the question of costs is focused, because a cost-cutting effect is ascribed to the digitalization at universities (Bowen, 2013). Although there are some studies focusing on the digitalization in the field of higher education, they are either very specific and their results can only be generalized to a very limited extent, or they are designed as a quantitative study and therefore allow only a very general view of the subject. A

good overview of the status of digitalization is provided by the annual ECAR studies by EDUCAUSE, which focus on both the students (50,000 participants) (Dahlstrom, 2015) and the lecturers (13,000 participants) (Brooks, 2015) in the USA. Despite the lecturers' high willingness to use innovative tools in teaching and the ever-increasing technical equipment available to students, the results show that digitalization is only at an early stage of development. Other studies focus on individual subtopics of digitalization, such as the use of mobile devices and online services in university libraries, the use of apps by medical students (Briz-Ponce & Juanes-Méndez, 2015), or the use of online literature and online references for studying (Connaway, Lanclos, & Hood, 2013). An aspect that is highly important but often missed out in the discussion is how students make use of and benefit from an increasingly digitized study environment. Therefore, insights into the needs of students and their view on digitalization are required.

3. RESEARCH DESIGN

In the absence of recent studies on the digitalization at universities from a student's point of view, this study is designed as a pilot study which focuses on the following research question:

From the student's point of view, to what extent is the student lifecycle already digitized and which improvements are needed?

To identify improvement opportunities, we need to find out which university IT services are relevant to the students and how their user experience proves to be. In this context, it is also interesting to know which applications are used for study purposes that are not offered by the university, but by commercial providers. Aside from improvements of existing services, the study also aims to determine which new services the university should provide.

As recommended in the literature (Prickarz & Urbahn, 2002; Schulz, Mack, & Renn, 2012), an interview guideline was developed to structure the focus group interviews with regard to the research question. A guideline from a previous study on students' requirements concerning a web portal was used as a starting point and only content adjustments had to be made. The guideline divided the interviews into three sections: In the first part, the participants had to describe their own experiences with the use of IT during their studies, in order to reveal which aspects are already digitized and which are still processed offline. In this context, used (university or commercial) services as well as usage situations and problems were of particular interest. In addition, the participants had to suggest IT services which the university should offer to simplify their studies. In the second part, the participants had to write down and classify those of the suggested IT services which they attach particular importance to. In the third part, each participant had to prioritize the services by assigning a total of ten points and explain his decisions. A ranking list was formed from the prioritizations.

Students from various departments of Münster University were recruited using flyers, the ZIV's website and Twitter profile, and the university's Facebook group. Vouchers with a value of 25 Euro were used as incentives. Eleven students from various disciplines were selected to participate in the two focus groups. The first group was made up of students from IT-related courses such as information systems, computer sciences and mathematics, while the second group consisted of students from non-technical courses such as psychology, history, politics or chemistry. However, most participants in the second group also considered their technical affinity as above-average. The participants were between 20 and 35 years old and studying between the 1st and 11th semesters. Two participants were female. The targeted equal distribution of both genders could not be achieved due to the self-recruitment procedure. Five participants had previously studied at foreign universities and were able to contribute these experiences to the discussion. One participant was already working and studying part-time. The participants did not know each other.

The focus groups took place in a neutral meeting room on two dates within a week in January 2017. The conversations were recorded and subsequently transcribed by assistants. The transcribed interviews comprise a total of 56 pages (30,300 words). The data were cleansed and structured, and significant statements were extracted and clustered into subject areas. The participants' prioritizations of services were also grouped into thematic areas (Ruddat, 2012).

4. FINDINGS

In the following, the results of the focus group interviews will be presented.

4.1 Status Quo of Digitalization

The participants perceive the degree of digitalization of their studies very differently depending on the particular aspect of student life. When it comes to the provision of lecture materials, they report that the Moodle-based e-learning platform Learnweb is widely used and has a very good reputation. Some lecturers, however, do not use the Learnweb due to a lack of technical competence. About half of the participants still work the traditional way using paper copies which are usually provided by the lecturer in form of a printed reader. While this might seem unprogressive, many participants do not want to change this situation as they prefer reading printed instead of digital copies. Some even expect a higher learning effect by working on paper. However, if documents are provided digitally by the lecturer, they are usually processed digitally as well. One participant even takes the trouble to digitize all handwritten notes and handouts himself. Annotating and taking notes with digital tools is still perceived as complicated or not suitable for all situations, though.

When it comes to literature research, some departments (e.g. theology) still make use of card indices instead of computer workstations. From the student's point of view, especially the online provision of literature (i.e. essays and books, in particular) is still in its infancy. The participants strongly agree that all literature should be available online to avoid that students have to compete for scarce book resources or cannot access required literature in time for seminar papers. One participant who had previously studied in the Netherlands would even pay significant tuition fees for online access.

The administration of courses and examinations is another aspects of studying that is not yet digitized entirely. While registration processes usually take place online and are largely digitized, participants from the humanities report that in their discipline registration lists on paper are still used sporadically. The administration of examination results, on the other hand, is still mainly paperbased. Digital badges are not yet used. As regards attendance and performance records, paperwork is still dominant as well.

Overall, the students have a rather conservative understanding of digitalization which, essentially, includes the online provision of material as well as online registration possibilities. New forms of learning such as MOOCS, interactive classroom systems or even virtual reality are irrelevant, and mobility is not a big issue either. Students still predominantly study at home using a PC or a book. According to the them, this will hardly change in the coming years. Lectures where attendance is expected are also considered appropriate and future-oriented. Infrastructural aspects (e.g. audio-visual equipment in the auditorium, WLAN) were of very little importance in the interviews.

4.2 User Experiences with University IT Services

Discussing relevant university IT systems, participants primarily mention the Learnweb, the exam registration system QISPOS, the cloud storage service sciebo and the library online public access catalog OPAC. In addition, most participants use standard software which is available via terminal servers, the Office 365 software package which is available at a special price to university members, and, to a somewhat lesser extent, the e-mail service perMail. With the exception of the printing service Print&Pay, the students doesn't bring into focus other university IT services or infrastructures (e.g. websites, communication infrastructure, media technology).

While the Learnweb receives an entirely positive evaluation, the exam administration system QISPOS has the greatest potential for improvement from the students' point of view. Almost all participants have heard of or made negative experiences because the system apparently is complicated and generates misunderstandings. They have, for example, not received important examination results and thus had some serious disadvantages in their course of studies. Particularly foreign students seem to have difficulties with the low degree of standardization regarding exam administration procedures which differ greatly depending on the department, course combination, the responsible

examination office and its respective system. Other universities have a different approach where students are registered for exams automatically with an opt-out option. Learnweb and QISPOS are university systems that students do not use in private contexts and, thus, there are little opportunities to draw comparisons. This, however, is different for university services with direct competitors from the commercial sector (e.g. sciebo vs. Dropbox or perMail vs. Google)

Numerous commercial services are used both, privately and for study purposes, mainly to perform communication tasks such as the exchange of information in group works or with lecturers. The real-time communication services of WhatsApp and Facebook are popular tools, for example, while the university's e-mail service perMail is avoided. The service is perceived as old-fashioned and complicated, but the main reason is the medium e-mail itself, which is deemed to be too formal, too slow, too complicated and too little group-based. WhatsApp, Facebook, Skype and Dropbox, on the other hand, offer easy-to-use functions for file sharing, video telephony, chat and status information. If e-mail services are used, it is those of commercial providers like Google or Microsoft which offer an integrated user experience. According to the participants, these services particularly benefit from their high integration with other services and their optimization due to fierce competition. In consequence, they are perceived as better developed and more intuitive. The fact that most students have already used popular commercial services before and will continue to use them after their studies is relevant as well: First, they do not have to learn and configure a new system, and, second, they can expect an already large user base which simplifies collaboration and data sharing considerably. In general, the participants are skeptical about university systems and see no need to replace commercial systems with university solutions. Participants who have studied abroad prefer the commercial solutions implemented there, with Google or Microsoft providing the basic services such as cloud, e-mail and Office software.

Overall, the user experience of university IT systems is rather poor. Students are particularly critical of those university services which they can compare to commercial alternatives from providers like Google, Dropbox or Microsoft. The latter are generally considered superior, as they must prove themselves in a competitive environment. Compared to commercial services, university services do significantly worse in terms of ease of use and look & feel. The participants consider the lack of integration, a feature that they value with services of commercial providers, as a major disadvantage of university systems. Most are not interfaced with each other or with privately used commercial services, so that students need a separate ID for each system. Moreover, media disruptions hinder their use. Thus, a convenient and seamless integration of all services (storage, collaborative work, e-mail, chat, Office applications) plays an important role in the preference for commercial providers. As a matter of principle, university systems have an image problem and some are not even given a try if commercial alternatives exist. The basic

advantage of the university services - a higher data protection - is noticed by the students, but it has virtually no effect on their usage behavior.

4.3 Service Requirements of Students

As already mentioned, the students' pictures of a digitized university are less visionary, but rather pragmatic. Although most of the participants had an above-average technical background knowledge according to their self-assessment, there are hardly any suggestions that go beyond the improvement of existing services. However, the big issue outshining everything else is an integration and standardization of these services.

The service improvements and new services identified by the students can be divided into six categories: study organization & management, literature provision, software provision, learning and communication, minor improvements of existing services, and others. Overall, 19 services were proposed. Most fell into the category of study organization, followed by minor improvements of existing services such as a more stable WLAN or more favorable prices for printing. The three most important services were a centralized platform where all services are integrated (23 of 110 points, quoted by 7 of 11 participants), the online provision of literature (15 points / 7 quotations) and a standardized exam administration system (12 points / 5 quotations). All other services received less than 10 points and a maximum of two quotations. Seven out of 19 services received points from only one person, usually the proposer.

The centralized service platform stands out as a clear favorite - especially, since a dedicated university app with quite similar functionalities received another 8 points. In concrete terms, the students expect a portal in form of a website or an app, which requires only one login and merges the most important status messages, information and a transcript of records. The displayed information should be highly personalized and match their specific subject of study and their study objective (examination regulations, schedule, information about lecture rooms). Ideally, this application would be complemented by intelligent features, which - similar to GoogleNow - take over a counseling function. These features should, for example, display suitable course modules based on examination regulations and previously completed courses, calculate the overall average score or show the next appointment including relevant location plans.

5. DISCUSSION & PRACTICAL IMPLICATIONS

Although this pilot study can only give limited insights due to the small, non-representative sample and the specific situation at the University of Münster, it provides a lot of valuable information, especially for those responsible for university IT. A larger sample and quantitative methods would allow to test the validity of the results, support them in a representative way and transfer them to other universities. From a practitioner's point of view, the good news is that students - in contrast to the stereotype of the digital native and in line

with the findings of previous studies (e.g. Bennett & Maton, 2010; Jones, Ramanao, Cross, & Healing, 2010; Kolikant, 2010; Lei, 2009; Margaryan, Littlejohn, & Vojt, 2011) - have a much more grounded and pragmatic view on the development in the next few years than company representatives suggest. In fact, the students understand digitalization primarily as the digital provision of lecture notes and online interaction possibilities with the university (i.e. registration for exams, communication with lecturers and fellow students). They do not demand a digital revolution in teaching or a fundamental reform of the academic studies (e.g. in form of mandatory online lectures). New learning formats such as lecture recordings or interactive elements are generally welcomed as additional possibilities, but they are not claimed for insistently. Nonetheless, students would appreciate a significantly stronger degree of digitalization, essentially in form of minor improvements of the core university IT services.

Three service categories clearly dominate the students' wishes for IT support: study organization, online literature and software provision. Great potential inheres in the creation of a centralized access to all relevant information and existing services (e.g. schedule, exam administration, certificates, study progress, contact information). But unlike most university apps which merely summarize general information with a cafeteria meal plan and a map, the students wish for a personalized solution that simplifies their study organization. From the students' point of view, IT should enable them to focus on the content of their studies, provide support for organizational problems, and grant easy access to resources, such as literature and software, while at the same time require little effort.

Against this background, a major problem of university IT could arise from the fact that users are affected by commercial services of large providers such as Google, Microsoft, Facebook and Dropbox. They expect the same integration of services they are accustomed to as well as an intuitive and simple way of use. But university systems are usually developed over many years due to historic reasons and operated decentrally. Thus, numerous unconnected systems co-exist (e.g. university library, data center platforms, university administration platforms, exam registration systems of various departments, various e-learning systems), making it necessary for students to use several IDs and understand different system logics. Furthermore, universities rarely invest in the design of their services, but focus on security aspects which are usually associated with a lower usage comfort. Students, in contrast, consider university systems as old-fashioned, complicated and less intuitive, and value security aspects rhetorically at most. In particular, the lack of integration of different services (and the accompanying need for different IDs for each system) is a major disadvantage. As the interviews indicate, most of the university services are no longer in the comfortable situation that they have to be used due to lack of competition, no matter how bad the user experience is. Commercial services from the private sphere are adopted in the university sphere as well, provided they seem suitable. In consequence, students argue for cooperations between universities and commercial providers such as

Google or Microsoft instead of university in-house developments, although there generally are diffuse concerns about data protection. Further research should examine in more detail the question which services the university itself should offer and which it should outsource to private providers (either completely or in form of a cooperation). Even though it is difficult to reconcile the desired user friendliness with the security requirements for university IT systems (which are particularly high in Germany), the results show that universities have to find a tradeoff. Above all, they are well advised to develop and implement digitalization strategies in order to actively shape this change.

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