

# Digitalization of Higher Education from an Academic's Point of View

Anne Thoring<sup>1</sup>, Dominik Rudolph<sup>2</sup>, Raimund Vogl<sup>3</sup>

<sup>1</sup>University of Münster, Germany, a.thoring@uni-muenster.de

<sup>2</sup>University of Münster, Germany, d.rudolph@uni-muenster.de

<sup>3</sup>University of Münster, Germany, r.vogl@uni-muenster.de

## Keywords

Digitalization, Qualitative Study, Higher Education, Teaching

## 1. ABSTRACT

It appears to be just a matter of time until the digital transformation fundamentally changes university life - even in Germany, where the higher education (HE) sector seems to be widely unaffected by now. University IT centers will face challenges in all fields of activity. On the one hand, infrastructures and services have to be adapted to fulfill new demands expressed by different stakeholders, including researchers, lecturers, students, and administrative staff. On the other hand, stakeholders have to be informed about existing possibilities opened up by digital tools. Both aspects necessitate an examination of the stakeholders' perspectives on digitalization in HE. Since IT services show great promise particularly for studying and teaching, two explorative studies, focusing on students and academics respectively, were conducted. In this paper, we report on the result of the second of these studies in which we interviewed lecturers to gather information on the status quo of digitalization in teaching and identify room for optimization at Münster University. The lecturers' experiences and suggestions demonstrate that an improvement of the IT infrastructure and equipment is only secondary. Instead, a centralization of information, knowledge and expertise in the field of digital teaching is required. Lecturers wish for a "center for digitalization" which they can contact for information and practical advice on existing IT services, for counseling on digital teaching concepts, and for support in the implementation of new digitalization ideas. From the lecturers' point of view, the university's management has to overcome concerns that digital teaching inevitably results in an entirely virtual university. Rather, the university should go one step further and value lecturers' efforts by creating incentive systems for excellent new forms of teaching.

## 2. BACKGROUND

In view of the future of universities in the digital era, the discussion about the influence of social megatrends such as individualization, globalization, mobility or lifelong learning on teaching gains momentum (Bowen, 2013; Brown-Martin & Tavakolian, 2014; Craig, 2016; Hanna, 2016; Hochschulforum Digitalisierung, 2015). In this context, IT services show great promise: The Internet allows for new types of courses such as MOOCs (Massive Open Online Courses) and SPOCs (Small Private Online Courses) which students can attend online (Fox, 2017; Rieber, 2017). Lecture recordings also remove place and even time constraints (O'Callaghan, Neumann, Jones, & Creed, 2017). Innovative digital teaching concepts that allow for a modulization of content can substantially change university studies because they facilitate differentiation and individualization. In this way, digitalization provides an opportunity to individually adapt the learning pace and, thereby, increase the learning success. Blended Learning, the combination of face-to-face courses and e-learning, emphasizes the lecturer's role as a moderator (Horn & Fisher, 2017; Rodríguez-Triana et al., 2017). New ways of communication between students and lecturers arise and new teaching methods like serious gaming (Barr, 2018; Lameris et al., 2017) or simulation models (Maurer & Engelmann, 2018) enhance the learning experience.

Most scientific studies that broach the issue of digitalization in higher education are either very specific (Delcore, Teniente-Matson, & Mullooly, 2014; Englund, Olofsson, & Price, 2016; McKnight et al., 2016) or they are designed as quantitative surveys which grant an overview but no in-depth insight into the subject (Dahlstrom, 2015; Dahlstrom, Brooks, & Bichsel, 2014). They usually place emphasis on the situation and opinion of students: their needs, expectations, experiences, usage behavior, preconditions, etc. (Conole, Laat, Dillon, & Darby, 2008; Dahlstrom, 2015; Henderson, Selwyn, & Aston, 2015; Selwyn, 2016; Wilms et al., 2017). This emphasis and the thought of a generation of digital natives entering university (Jones & Shao, 2011; Lei, 2009) might lead to the misconception that students were the only driver behind the process of digitalization and an improvement of studying its only objective. But as Cope and Ward (2002) point out, not just the students', but also the lecturers' perspective is important. The discussion and assessment of technical capabilities and innovative ways of teaching should take into account that lecturers are heavily affected from developments in this area, too. A digital transformation in teaching would affect their everyday work and job requirements dramatically.

Overall, there is still a lack of studies providing information on the experiences, wishes and opinions of academics regarding the digitalization of university life, which could, amongst other things, be harnessed for university IT. Therefore, this explorative study aims to give first insights into the academics' perspective, and - in terms of a practical purpose - identify opportunities for the improvement of existing IT services and structures at Münster University. In combination with our previous study (Thoring, Rudolph, & Vogl, 2017) which centers students, it also serves as a starting point to describe a full picture of different expectations and needs as well as concerns and obstacles as to the digitalization of teaching and learning.

### 3. RESEARCH METHODOLOGY

In the absence of recent studies describing the digitalization of universities in-depth from the students' and especially the lecturers' point of view, we planned two pilot studies to examine each perspective and compare the results. For our first study (Thoring et al., 2017), focus group interviews with students were conducted in 2017. As the method had proved successful, we only had to make minor adjustments for this follow-up study which focuses on the following question:

*From the lecturer's point of view, to what extent is teaching in higher education already digitized and which improvements are needed?*

To answer this question, it is necessary to clarify how digitized the academic studies already are from the lecturers' point of view. Moreover, it is important to find out how academics evaluate their experiences with university IT services in order to identify improvement opportunities. Eventually, the study also tries to spot necessary modifications which the university should make to stimulate the digitalization process according to its lecturers.

To produce comparable results, an existing interview guideline from our previous study in this field was adapted to the situation of lecturers. The guideline divided the focus group interview into three sections: In the first part, the participants had to describe their experiences with the use of IT at work and for teaching purposes in particular. In the second part, they had to suggest modifications that the university should make to support digital teaching. In the third part, the participants had to prioritize the suggestions and a ranking list was formed based on the prioritizations.

Academics of Münster University were informed about the project using a mailing list, the IT center's website and its Twitter profile. A sample representing the university's departments was desired, but could not be forced due to the self-recruitment procedure. The final sample consisted of eleven academics with teaching experience from six departments, mainly natural and life sciences. The survey included two 1.5-hour guided focus group interviews which took place in December 2017. The conversations were recorded and transcribed. Subsequently, the data were cleansed and structured. Significant statements were extracted and clustered into subject areas.

### 4. FINDINGS

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

## 4.1. Status Quo of Digitalization

According to the participants, the university does not yet communicate a strategy for the digitalization of teaching and there are hardly any practical guidelines in most departments, leaving it up to the academics to find their own concept. In consequence, there is a general uncertainty about what exactly a digitalization of teaching means. Most participants see themselves as pioneers who have entered largely uncharted waters. Getting involved in a new, complex topic like this without much guidance requires motivation and a considerable investment of time and effort. Some lecturers have started to explore progressive forms of teaching on their own (e.g. Just-In-Time-Teaching) or are involved in small digitalization projects. The participants also noted that the majority of their colleagues is more reluctant or even opposed to digitalization, because of nescience, insecurity, ignorance or simply a lack of time. These observations are in line with the findings of Ocak (2011) who identifies eight reasons for a low usage of digital environments among academics: complexity of the instruction, lack of planning and organization, lack of effective communication, need for more time, lack of institutional support, changing roles, difficulty of adoption to new technologies, and lack of electronic means.

The participants agree that the digitalization affects all aspects of teaching, including lectures, material distributions, assessments, course evaluations, and administrative tasks. Nonetheless, the status quo of digitalization is described as heterogeneous, depending on the particular task area, on the one hand, and on the department, the chair and the lecturer, on the other.

Lectures with PowerPoint presentations are still standard, but video content, audience response systems and digital devices have been adopted by many lecturers as well. Some of the participants are testing lecture recordings in the current semester and their opinions are ambivalent: They value that students can choose the time and speed of reception, but doubt that students understand these offers to be supplementary and use them efficiently. While the production of lecture recordings initially means extra effort, they eventually open up time slots for new forms of teaching. One participant, for example, is successfully testing Just-In-Time-Teaching and Flipped Classroom. However, lecturers also notice that not all students are digitally savvy and that some content is not suitable for digital teaching formats. Chalk-and-talk teaching using the blackboard, for instance, is appreciated for knowledge transfer in introductory courses, because it slows down the pace. When it comes to lecture materials, PDFs are an established format for lecture notes and literature which are distributed either via the university's e-learning platform or via the department's website.

E-assessment is of little importance in most disciplines, but has become a standard at the Department of Medicine where exams are usually multiple-choice. Course evaluations, on the other hand, are mostly digitized, using various tools such as EVALuna, EvaSys, Unipark or Qualtrics. The conversion from paper to digital questionnaires does not always run smoothly though, because students seem to feel less obliged to participate in digital surveys and response rates are significantly lower as a result. Moreover, the surveys do not yet reflect the current transition from analogue to digital formats and are often useless in consequence.

Administrative tasks (e.g. exam administration, teaching reports, and room bookings) are performed very reluctantly, because most bureaucratic processes are only partially digitized. Especially the booking of rooms is rated unfavorably, because of various systems and unclear responsibilities. Teaching reports have to be compiled digitally, but cannot be processed digitally which leads to irritation among the participants. Overall, media discontinuities and parallel structures are perceived as an unnecessary burden and give the impression that the university's administration lacks an understanding of IT processes.

In summary, the participants conclude that the digitalization of teaching has not progressed far enough at Münster University, yet. Despite having just entered a testing phase, the participants see themselves as rather progressive which suggests that many lecturers are not yet dealing with the subject of digitalization at all.

## 4.2. User Experiences with University IT Services

Discussing relevant university IT systems and services, the participants primarily mention the e-learning platform Learnweb and the exam registration system QISPOS. Rather new offers such as the cloud storage service sciebo and the audience response system ZIVinteraktiv are discussed as well.

Other university services are of little or no importance in the discussion (e.g. standard software, printing service, e-mail service, communication infrastructure, or websites).

Overall, participants are satisfied with the Learnweb which they primarily use to distribute lecture notes and literature. When it comes to video material, the platform seems to meet its limits, making it questionable if it is suitable for distributing lecture recordings in the current state. However, the participants also note that they are far from exploiting the possibilities of the platform due to a lack of experience and a lack of time to familiarize themselves with its functionalities. While the Learnweb receives a positive evaluation, the exam administration system QISPOS has the greatest potential for improvement from the lecturers' point of view. It is criticized in many ways, described as impossible to use in parts, and cited as an example for complicated administration tools and laborious bureaucratic processes.

The university cloud service sciebo has been adopted by the majority of the participants and generates a high level of satisfaction, but two academics report that other solutions are still common at their departments (ownCloud and Google Docs which is fully integrated into Google Drive). From the lecturers' point of view, cloud storage services generally are more suitable for research than teaching. As regards audience response systems, the participants have tried various applications. The university's app, ZIVinteraktiv, is widely unknown and perceived as limited in its functionalities, but commercial apps (e.g. Kahoot! and TurningPoint) and in-house developments of other universities (e.g. PINGO and ARSnova) were heavily tested. Kahoot! Is perceived as time-consuming in preparation and execution, and PINGO seems to be rather complicated. ARSnova, on the other hand, was not criticized.

When it comes to communication services, lecturers show a significantly different user behavior than the students questioned in our previous study (Thoring et al., 2017): While students need services to coordinate groups and make use of the same commercial networks and communication tools they favor for private purposes (i.e. Facebook, WhatsApp and Skype), the participants completely withdraw from these media in their role as lecturers because they do not want to be permanently available. Instead e-mail and personal communication dominate.

In summary, the discussion about existing university IT systems and services was rather brief but revealed that the users' experiences are ambivalent. To improve the current situation, the participants would highly welcome an elimination of parallel structures and media disruptions as well as a reduction of bureaucracy.

### 4.3. Improvement Opportunities

The lecturers' suggestions for improvement can be divided into six categories: university strategy, information policy, lecture content, lecture administration, equipment and infrastructure, and others. To foster the digitalization of teaching, lecturers primarily need technical and didactic support in creating digital content (34 of 110 points). Moreover, they require centralized information on existing IT tools and services (23 of 110 points) because currently there is no overview of existing possibilities in digital teaching. Both tasks, information and practical support, should be performed by a central support office: a "center for digital teaching". Interestingly, none of the participant mentioned the ZHLdigital, the university's center for digital teaching, which was reconstituted recently and is supposed to exactly fulfill those tasks. Information and communication need to be intensified considerably to establish such an institution.

From the lecturers' point of view, the university's management also has to overcome concerns that digital forms of teaching would supersede classroom teaching and inevitably lead to a virtual university. The participants, on the contrary, expect an enhancement of classroom teaching beyond basic knowledge transfer by means of an increased interaction and discussion. Therefore, the university should even go one step further and value lecturers' efforts by creating incentive systems for excellent new forms of teaching similar to those existing for excellent research.

In summary, a digitized university is not equivalent to a virtual university but definitely implicates significant changes in teaching, according to the participants. These changes should be reflected in the university's strategy and structure in form of incentives and a central point of contact, information and practical support. These expectations already go beyond the students' picture of a digitized university which is rather pragmatic (Thoring et al., 2017): Students do not ask for a

fundamental change of teaching and studying, but prioritize an integration and standardization of existing IT services.

## 5. CONCLUSION

This explorative study was designed to gain first insights into the digitalization of teaching from an academic's point of view. These insights are subjective assessments which have to be evaluated in relation to the specific situation at Münster University. Nonetheless, we are convinced that the study complements our examination of the students' perspective (Thoring et al., 2017) in a meaningful way and provides valuable information for those involved in university management, administration and IT. We are aware that additional focus groups with lecturers from the humanities and social sciences are necessary to complete the picture and subsequent quantitative surveys would allow testing the validity of the results.

Lecturers describe the status quo of digitalization at Münster University as very heterogeneous, depending not only on the department, the chair and the individual lecturer, but also on the task area - an observation which is generally in line with the students' experiences (Thoring et al., 2017). The participants understand their current situation as a testing or orientation phase. Simple digital tools such as audience response systems are increasingly used to diversify lectures and create interaction, but lecture recordings and new lecture designs are exceptions. Students do not mention any experiences with video content or recordings and even though they would welcome such elements as additional possibilities, they do not claim them insistently. Academics, on the other hand, are more eager to experiment with new forms of teaching and learning. As regards lecture materials, academics usually provide lecture notes and literature in PDF format and distribute them via e-learning platforms. In contrast, students report that digital formats and the Learnweb indeed gain in importance, but printed scripts are still very common. E-assessment is of little importance in most disciplines, but course evaluations are mostly digitized. When performing administrative tasks, lecturers are confronted with parallel structures, because relevant processes are only partially digitized. Students also recognize this inconsistency, stating that the registration for exams is largely digitized, while the administration of the results is largely paper-based. The participants do not discuss the quality of existing university IT services extensively, but have quite clear opinions: The university's e-learning platform and cloud storage service are looked upon favorably, while the exam administration tool is criticized for being complicated and laborious. In this context, lecturers recommend an elimination of parallel structures and media disruptions.

When comparing the lecturers' with the students' focus group interviews (Thoring et al., 2017), it is evident that the discussions differed considerably: Students have a rather conservative opinion as to a digital university and understand digitalization primarily as the digital provision of lecture notes, the digital organization of their studies, and online interaction possibilities. Since these basics already exist, their discussion of improvement opportunities centered on the optimization and technical integration of existing IT services. They do not expect a digital revolution of teaching and studying but a smooth digital evolution. Due to their comparatively progressive attitude, the questioned academics, on the other hand, discussed strategical and structural changes that would facilitate a digitalization of teaching and enable new teaching formats. Their vision is much closer to a reformation of university teaching. In consequence, they do not primarily request an improvement of the IT infrastructure and equipment, but a clear direction of the university and a centralization of information, knowledge and expertise in the field of digital teaching. A "center for digitalization" could bring together relevant players, including IT professionals and didactics experts.

Ultimately, however, the lecturers' perspective is differentiated: Even though the participants are eager to experiment with digital approaches, a digitalization of teaching is not seen per se as the future of teaching, but rather as a means to an end. To them the basic question is: What is the best way to teach our students in the future? They agree that concepts are crucial - whether they are digital or not. At this point, academics expect the university to develop and implement a future-oriented and visionary teaching strategy that also values extraordinary commitment and excellence in teaching.

## 6. References

- Barr, M. (2018). Student attitudes to games-based skills development: Learning from video games in higher education. *Computers in Human Behavior, 80*, 283-294.
- Bowen, W. G. (2013). *Higher education in the digital age*. Princeton, N.J.: Princeton University Press.
- Brown-Martin, G., & Tavakolian, N. (2014). *Learning {re}imagined: How the connected society is transforming learning*. London, UK, New York, NY, USA: Bloomsbury Academic, an imprint of Bloomsbury Publishing Plc.
- Conole, G., Laat, M. de, Dillon, T., & Darby, J. (2008). 'Disruptive technologies', 'pedagogical innovation': What's new? Findings from an in-depth study of students' use and perception of technology. *Computers & Education, 50*(2), 511-524. <https://doi.org/10.1016/j.compedu.2007.09.009>
- Cope, C., & Ward, P. (2002). Integrating learning technology into classrooms: The importance of teachers' perceptions. *Educational Technology & Society, 5*(1), 67-74.
- Craig, R. (2016, June 28). The technology of higher education. *TechCrunch*. Retrieved from <https://techcrunch.com/2016/06/28/the-technology-of-higher-education/>
- Dahlstrom, E. (2015). *ECAR Study of Undergraduate Students and Information Technology, 2015*. Retrieved from <http://net.educause.edu/ir/library/pdf/ss15/ers1510ss.pdf>
- Dahlstrom, E., Brooks, C., & Bichsel, J. (2014). *The Current Ecosystem of Learning Management Systems in Higher Education: Student, Faculty, and IT Perspectives*. Louisville, CO. Retrieved from ECAR website: <https://net.educause.edu/ir/library/pdf/ers1414.pdf>
- Delcore, H., Teniente-Matson, C., & Mullooly, J. (2014). The Continuum of Student IT Use in Campus Spaces: A Qualitative Study. Retrieved from <https://er.educause.edu/articles/2014/8/the-continuum-of-student-it-use-in-campus-spaces-a-qualitative-study>
- Englund, C., Olofsson, A. D., & Price, L. (2016). Teaching with technology in higher education: Understanding conceptual change and development in practice. *Higher Education Research & Development, 36*(1), 73-87. <https://doi.org/10.1080/07294360.2016.1171300>
- Fox, A. (2017). Can MOOCs and SPOCs Help Scale Residential Education While Maintaining High Quality? *MOOCs and Their Afterlives: Experiments in Scale and Access in Higher Education, 37*.
- Hanna, N. (2016). *Mastering digital transformation: Towards a smarter society, economy, city and nation* (First edition). *Innovation, technology, and education for growth*. Bingley: Emerald Publishing.
- Henderson, M., Selwyn, N., & Aston, R. (2015). What works and why? Student perceptions of 'useful' digital technology in university teaching and learning. *Studies in Higher Education, 42*(8), 1567-1579. <https://doi.org/10.1080/03075079.2015.1007946>
- Hochschulforum Digitalisierung. (2015). *Diskussionspapier: 20 Thesen zur Digitalisierung der Hochschulbildung*. Berlin. Retrieved from Hochschulforum Digitalisierung website: [https://hochschulforumdigitalisierung.de/sites/default/files/dateien/HFD%20AP%20Nr%2014\\_Diskussionspapier.pdf](https://hochschulforumdigitalisierung.de/sites/default/files/dateien/HFD%20AP%20Nr%2014_Diskussionspapier.pdf)
- Horn, M. B., & Fisher, J. F. (2017). New Faces of Blended Learning. *Educational Leadership, 74*(6), 59-63.
- Jones, C., & Shao, B. (2011). *The net generation and digital natives: implications for higher education*. York. Retrieved from Higher Education Academy website: <http://oro.open.ac.uk/30014/>
- Lameras, P., Arnab, S., Dunwell, I., Stewart, C., Clarke, S., & Petridis, P. (2017). Essential features of serious games design in higher education: Linking learning attributes to game mechanics. *British Journal of Educational Technology, 48*(4), 972-994.
- Lei, J. (2009). Digital Natives As Preservice Teachers. *Journal of Computing in Teacher Education, 25*(3), 87-97. <https://doi.org/10.1080/10402454.2009.10784615>
- Maurer, H., & Engelmann, C. (2018). Aktives Lernen durch EU Simulationen: Eine kritische Auseinandersetzung mit Erfahrungen an der Universität Maastricht. In *Europa spielerisch erlernen* (pp. 181-202). Springer.

- McKnight, K., O'Malley, K., Ruzic, R., Horsley, M. K., Franey, J. J., & Bassett, K. (2016). Teaching in a Digital Age: How Educators Use Technology to Improve Student Learning. *Journal of Research on Technology in Education*, 48(3), 194-211. <https://doi.org/10.1080/15391523.2016.1175856>
- O'Callaghan, F. V., Neumann, D. L., Jones, L., & Creed, P. A. (2017). The use of lecture recordings in higher education: A review of institutional, student, and lecturer issues. *Education and Information Technologies*, 22(1), 399-415.
- Ocak, M. A. (2011). Why are faculty members not teaching blended courses? Insights from faculty members. *Computers & Education*, 56(3), 689-699.
- Rieber, L. P. (2017). Participation patterns in a massive open online course (MOOC) about statistics. *British Journal of Educational Technology*, 48(6), 1295-1304.
- Rodríguez-Triana, M. J., Prieto, L. P., Vozniuk, A., Boroujeni, M. S., Schwendimann, B. A., Holzer, A., & Gillet, D. (2017). Monitoring, awareness and reflection in blended technology enhanced learning: A systematic review. *International Journal of Technology Enhanced Learning*, 9(2-3), 126-150.
- Selwyn, N. (2016). Digital downsides: Exploring university students' negative engagements with digital technology. *Teaching in Higher Education*, 21(8), 1006-1021. <https://doi.org/10.1080/13562517.2016.1213229>
- Thoring, A., Rudolph, D., & Vogl, R. (2017). Digitalization of Higher Education from a Student's Point of View. In *EUNIS 2017 - Shaping the Digital Future of Universities* (pp. 279-288). Münster: European University Information Systems Organization.
- Wilms, K. L., Meske, C., Stieglitz, S., Decker, H., Froehlich, L., Jendrosch, N., . . . Rudolph, D. (2017). Digital Transformation in Higher Education: New Cohorts, New Requirements? In *Proceedings of the 23rd Americas Conference on Information Systems (AMCIS)*.

## 7. AUTHORS' BIOGRAPHIES

**Anne Thoring** is a research assistant for public relations and marketing at the IT center (Zentrum für Informationsverarbeitung, ZIV) of the University of Münster (Germany). She graduated from University College London (UK) and the University of Münster with degrees in communication sciences, publishing, and strategic communication. Her research focuses on strategies and tools of corporate communications and digitalization processes in higher education.

More Info: <https://www.uni-muenster.de/forschungaz/person/17026?lang=en>

**Dr. Dominik Rudolph** is managing director of the IT center (Zentrum für Informationsverarbeitung, ZIV) of the University of Münster (Germany). He received his PhD from the University of Münster, where he also studied communication sciences, economics and modern history. His graduate thesis has been appraised as one of the best dissertations in 2014 (German Thesis Award). His research focuses on the diffusion of innovations, the management of research data, and digitalization processes in higher education.

More Info: <https://www.uni-muenster.de/forschungaz/person/7445?lang=en>

**Dr. Raimund Vogl** is director of IT for the University of Münster (Germany). He holds a PhD in elementary particle physics from the University of Innsbruck (Austria). After completing his PhD studies in 1995, he joined Innsbruck University Hospital as IT manager for medical image data solutions and moved on to be deputy head of IT. He is president of EUNIS (European University Information Systems Organization) and a member of GMDS, EuSoMII and AIS and represents Münster University in DFN, ZKI, DINI and ARNW. His research currently focuses on the management of complex information systems and information infrastructures.

More Info: <http://www.uni-muenster.de/forschungaz/person/10774?lang=en>