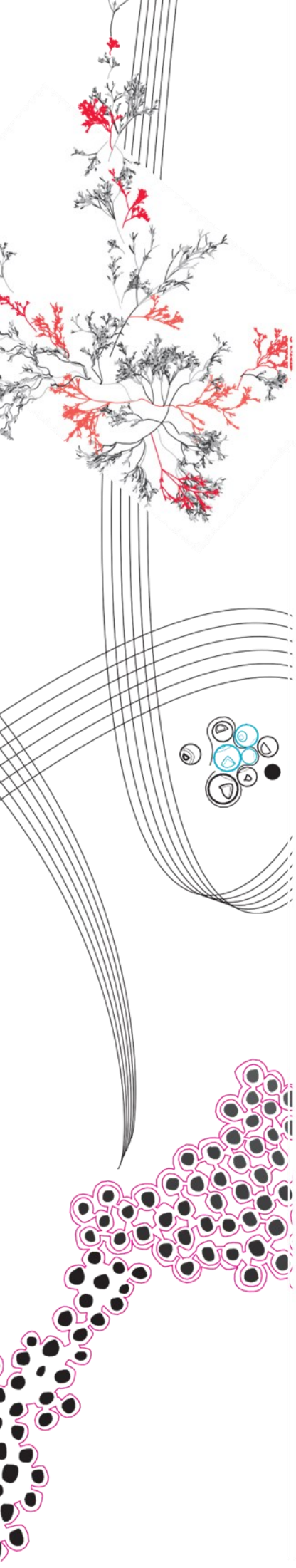

Changing the face of future education

Assessing the policy success of a digital policy at universities in North-Rhine Westphalia

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Abstract

The digital policy “Digitalstrategie” is affecting students at universities in NRW. Studies have shown that students as well as universities must tackle a series of problems to implement those policies. For a policy to be successful, multiple aspects must be met. This research aims at giving practical implications for the implementation of the “Digitalstrategie NRW”, especially concerning the needs of students in the implementation process. Building on the existing theoretical groundwork, a research question has been generated: “How successful is the federalist organized Digitalstrategie NRW, especially concerning the positions of students against the opinions of stakeholders?” Policy success is defined as a spectrum that focusses on the target group.

For the analysis, a triangulation-method was chosen. Based on document analysis, a survey was designed. Interviews were held with students and stakeholders. The results indicate that students want more support at their university, that some aims of the policy are not achievable yet, and that teachers play an important role in the implementation. It is recommended that students receive different support than the policy originally intended. Moreover, the aims of the policy should be continued, and teachers should keep receiving the support to implement digital learning and teaching methods.

Table of Contents

1. Introduction

Now that the Coronavirus holds the world in its clutches, we must rely on digital tools such as Skype and WhatsApp to communicate safely. Universities are now also heavily reliant on these digital tools to be able to continue their teaching online. These educational institutions are part of society and therefore, heavily influenced by societal changes such as the Coronavirus.

But even before the Coronavirus emerged, universities were struggling to catch up with the reality of students being frequently involved in the digital realm, where they use tools such as WhatsApp or Skype to communicate, download literature on Google, or search for lectures online. In 2018, more than 94.9% of students in Germany used the internet multiple times per week. (VuMA, 2018).

To strengthen the digitalization of universities in one of the German "Bundesländer" (federal states), namely North-Rhine-Westphalia (NRW), the policy "Digitalstrategie" (digital strategy) was established by the North-Rhine-Westphalian Government in 2019. Together with ministries, universities, and an implementation agency, the policy aims to digitalize different parts of society (economy, infrastructure, etc.). One of these parts is education. Next to schools, universities are part of the educational sphere. In the sphere of education, the Digitalstrategie mainly aims at improving the structure, administration, and the learning and teaching environment of universities. (Landesregierung NRW, 2019, pp.26-27)

Students are the most influenced stakeholders of this policy because it directly affects their study environment and educational process. However, it remains unclear, whether students concur with this policy.

Even though implications have been made, that students do prefer organizational structures online but still want an analog study environment, the stance of university students towards digitalization of universities has mostly been neglected in current research (Thoring, Rudolph, & Vogl, 2017).

This paper aims to assess to what degree the policy is successful. The degree of success will be measured from the viewpoints of students in comparison to the opinions of different stakeholders. The paper will widen the scientific horizon, as it gives a broader insight into university students' demands concerning the digitalization of universities and especially students' learning environments. It will also give an insight into the different positions of universities, the ministry, the implementation agency, and students, on the policy and the current digitalization. Moreover, the paper will include practical implications for the ongoing policy implementation. The scope of the

paper is focused on universities in NRW and includes research, which was conducted over two months.

Students' perspectives are vital for this research. Therefore, based on their opinions and the ideas of stakeholders the following research question has been developed: "How successful is the federalist organized Digitalstrategie NRW, especially concerning the positions of students against the opinions of stakeholders?"

2. Theory

2.1. Higher Education in a Digital World

Different digitalization processes affect universities in different ways. Traditionally, higher education happens on campus, but new ways of learning have evolved or emerged through digitalization, such as distance education and blended learning (Harting & Erthal, 2005, pp. 36-38). Distance education is the most radical form of education as it removes the physical attendance on campus completely. Distance education, as another form of teaching and learning, has been available since the 1700s. It was not the organized distance education that we know today. Rather, it was correspondence education that relied on postal service. An early example can be found in the Boston "Gazette" where an advertisement for correspondence education was placed. Here, students could receive shorthand lessons by post. (Harting & Erthal, 2005) The process of delivering and receiving material was not as easy as it is in the digital age, where for example, e-mails, are more convenient. Organized distance education, offered by universities, started in the mid-1800s when Oxford and Cambridge began offering an extension service for correspondence instruction. (Harting & Erthal, 2005, p. 36) The goal of distance education, in the past and today, is to make education available to people who cannot move to the campus. (Banas & Emory, 1998, p. 366) When efficient technologies started to emerge and computers became more common, distance universities decided to adapt to the current technology and use it for their advantage. (Harting & Erthal, 2005, p. 37)

Many universities try to advance their standards in digitalization and place a high value on it. As it benefits both the flexibility of the university and the student by blending the digital and analog world, while also offering new possibilities like online lectures or discussions. (Gilch et al., 2019, p. 3)

A less drastic change for universities compared to distance education is the blended learning approach. Blended learning is a concept in which parts of the education are done via technology (video, audio, etc.)while other parts are done in the classroom. Therefore, as opposed to distance learning, there is still a face-to-face interaction with the teacher. (Boelens, De Wever, & Voet, 2017, p. 2) Blended learning consists of two learning environments. The traditional face-to-face environment, which we find at traditional campuses and the emerging computer-mediated environment. While these two environments used to be separated, they overlap in blended learning. There is a variety of definitions of blended learning. While some determine the term as

combining instructional modalities or methods, the definition that will be used in this paper is defining blended learning as the combination of online and face-to-face instruction. (Graham, 2006, p. 4) It will be used in this paper as it emphasizes the combination of teaching and technology which is the focal point of the policy.

It also depends on the institution as to why they chose the blended learning approach. However, most of the institutions that prefer blended learning, use it because they hope that it offers flexibility as well as efficiency and diversity, while still maintaining the classical class-based approach. However, students need to approve of the blended learning approach. (Sharpe, Benfield, Roberts, & Francis, 2006, p. 3) It is also an individual matter, whether students prefer a blended learning approach but generally positive feedback on blended learning has been found in previous research. (Waha & Davis, 2014, p. 179)

It must be kept in mind that blended learning must be implemented at universities, which can be very problematic. The teaching staff is hardly homogenous. Some bring extraordinary computer skills and are willing to engage in blended learning while others may resign under the strain of change. Moreover, teachers' beliefs also influence their use of technology in teaching. Hence, teachers' beliefs must change, to change technology-use in teaching which is a rather demanding challenge as beliefs do not change easily if at all. (Kim, Kim, Lee, Spector, & DeMeester, 2013, p. 82) Additionally, introducing e-learning strategies at higher education institutions includes costs. Not only the institutional changes are cost-intensive but also permanent maintenance. This includes training of staff, updates, and community management. (Pfeffer, 2011, p. 82) The implementation of digital education needs clear guidelines. The institutions must transform to accommodate both the administrative and structural changes. (Ghemawat, 2017, pp. 72-73)

If online education is implemented at a university it can have several benefits. For example, if designed correctly, online education can even adhere to multiple forms of learning types. (Ghemawat, 2017, p. 57)

One part of online education in a blended learning environment is frequent online assessment. The so-called e-assessment enables students to take responsibility for their learning. Moreover, computer-mediated assessment is independent of a place as opposed to traditional assessment, where students must be present at university. (Appiah & Van Tonder, 2018, p. 1456)

When comparing the implementation of distance education to the implementation of blended-learning, similar obstacles must be considered as the implementation of distance education also

entails a cost-factor. Additionally, technical support is vital and needs to be accessible and user-friendly for both teaching staff and students. Moreover, materials and literature need to be available. However, when implementing distance education, courses also must be promoted, marketed, and implemented. (Schauer, Rockwell, Fritz, & Marx, 2005, pp. 13-14)

As the Digitalstrategie is not only aiming at the teaching and learning aspect but includes several administrative changes, universities will most likely find themselves in a battle for resources. The change of infrastructure at universities in the digital age is demanding as it requires flexibility and adaptability. Additionally, new tools need to be implemented and adapted to already existing structures. (Gafurov, Safiullin, Akhmetschin, Gapsalamov, & Vasilev, 2020, pp. 80-81) Universities must be aware of the demands that the policy makes and place priorities on the different parts of the implementation. Hence, apart from budget issues and infrastructural challenges, external factors such as students and the policy influence the digitalization. Universities should consider different methods of teaching and not blindly connect the two sectors of face-to-face instruction and computer-mediated teaching. (Ghemawat, 2017, p. 75)

In the thesis, blended learning will be used as an example of teaching and learning at university. Even though the Digitalstrategie also aims at transforming the University of Oldenburg into a distance education facility, the paper will be concerned with a blend of traditional and computer-mediated teaching as the analysis of distance education in comparison to the policy is beyond the scope of this paper. The focus here will be to distinguish the different perspectives of stakeholders, universities, and students.

Hence, the first sub-question emerges. *Do students in NRW even prefer a blended learning approach?*

2.2. Students' perception of higher education in a digital world

The potential for using technology in education has been recognized early. Not only did distance learning already adapt technology in the 1980s, but technology in the educational sphere has been discussed by scientists and companies like Apple and IBM as early as the late 1950s and 60s. (Saljo, 2010, p. 54) Even though technology resources were available, it proved difficult to implement them in the already established structures of teaching and learning. Further, success depends on several variables such as student engagement, group participation, frequent interaction, and feedback from mentors, as well as connections to real-world contexts. Today, many skills, that are needed to

engage in the practice of digital teaching and learning are acquired outside the university. The learning process happens via inventing and interacting with the available tools. (Saljo, 2010, p. 55)

The generations, who are growing up acquiring these skills are the so-called digital natives (Saljo, 2010, p. 56), who stand in opposition to digital immigrants, who are the generations that had to learn digital skills in their adult life (Wang, Myers, & Sundaram, 2013, p. 409).

However, the skills that are required for academic work, are not necessarily the ones that are needed for everyday technology, that digital natives use. For example, writing a blog or a fanfiction does not require the same skillset as writing an academic essay. (Bennett & Maton, 2010, p. 325) Therefore, students still must be taught the necessary skills for academic work. To conclude, students today learn differently. Hence, the question remains whether the system is meeting students' needs. (Bennett & Maton, 2010, p. 776)

Most students in Germany are between the ages of 20 and 29. (Statista, 2020) Hence, they are the ones that started to grow up with mobile phones, the internet, and many other tools and websites that are common today. They are already used to communication channels, such as Skype and WhatsApp, and have gotten into contact with Word and PowerPoint in school. But which digital tools would students like and in what way are they able to use them?

There are six categories that digital services can be divided into study organization and management, literature, provision, software provision, learning and communication, minor improvements of existing services, and others (Thoring et al., 2017).

However, students are not always aware of what is possible when it comes to transforming education via digital tools. Many do not want a dramatic change at their university. Students want the already established tools to be enhanced, rather than drastically changing the infrastructure of their university. (Thoring et al., 2017) One might ask why, as students are aware of the possibilities that technology offers. Artificial intelligence in phones or virtual reality in videogames is not a new trend but already established. Margaryan et al. found in their research, that students do not have sufficient knowledge of the tools that they use at university. Hence, their imagination of what could be possible when it comes to the learning process aided by digital tools is restricted. (Margaryan, Littlejohn, & Vojt, 2011, p. 439) Furthermore, students do not quite understand the potential of technology at university because they only use it in limited ways or not at all. When asked which factors prevent the use of technology, they name a lack of digital skills, reluctance to change, and systematic problems such as infrastructure and time. (Margaryan et al., 2011, p. 437)

Nevertheless, students do use digital tools to structure their studies. They use their E-mail accounts and their laptops, but apart from that, the use of tools is restricted. (Bond, Marin, Dolch, Bedenlier, & Zawacki-Richter, 2018, p. 10) When it comes to studying with digital tools, they have a slightly lower impact on the success of students than the analog way. Only if the tools are successfully applicated, an improvement of the learning success can be detected. Thus, it is rather the way that tools are used than whether they are used at all. (Higgins, Xiao, & Katsipataki, 2012, p.3)

There is an abundance of new technologies that can be used to enhance learning and teaching. But what tools can students use? There are tools used for formal and informal digital learning. Informal learning tools are located outside the university course while formal learning tools are used in the courses. (Margaryan et al., 2011, p. 433)

To create an effective environment of digital teaching and learning, a hybrid system consisting of internal and external tools should be implemented. Simply enhancing existing services like the website for study organization is not enough to create a consistent change. (Bond et al., 2018, p. 13).

When using tools, students prefer them to save time and effort. However, practices related to learning are only infrequently used. When using practices related to learning it is mostly reviewing lecture recordings. (Henderson, Selwyn, & Aston, 2017, p. 1570) The tool that is the most important to students is online libraries. Not only do they save time, but they also spare the hustle of fighting over scarce books, that are only available in a limited quantity at the university library. (Henderson et al., 2017, p. 1573)

However, digital tools do not only bring positive changes to a student's schedule and study organization. If a lecture does not manage to attract the student's attention one might rather grab the phone, that is lying there on the table. Facebook, Instagram, and co. can be more coercive than many lectures. (Selwyn, 2016, p. 1011) Furthermore, digital tools can also disrupt the course flow. The smartboard does not turn on, or the internet is down. Not only is that very time-consuming, but it also disrupts the level of concentration that students display. Additionally, students may experience technology as a stress-factor. The typical student is in constant touch with technology. Not only does that lead to an unceasing feeling of missing out, but these tools can also be a form of escape from pressing assignments and deadlines, adding to the experienced pressure. (Çelik & Odacı, 2013, p. 507)

Students also experience difficulties when trying to access websites, or when trying to download and work with software. “Detriment” is also another occurring theme in which technology leads to lower quality provisions and practices. For example, online discussions are not as in-depth and rewarding as they would be in the classroom. Moreover, teachers are not as obliged to interact with students, which can lead to insufficient support impacting students’ performance. (Selwyn, 2016, p. 1010) Students also report an impact on their well-being as eight to ten hours in front of a screen can lead to headaches or other health-related problems. (Selwyn, 2016, p. 1012)

Gathering the information from the literature, the question remains: *Which tools do students use at universities in NRW? Moreover, do they feel any negative effects of these tools either on their mental health or in the classroom and the learning environment?*

2.3. Policy Implementation

The NRW Digitalstrategie aims at the digitalization of universities and is currently implementing several instruments to enhance that process. The government of NRW issued the policy and the implementation agency “Digitale Hochschule NRW” is implementing the policy at Universities. Students and universities in NRW are the target group and affected by the changes. As we have already seen, becoming accustomed to the new education concepts requires a tremendous effort in an institution. However, the progression of a university towards a digital university is in our case not only the responsibility of one university but that of many actors.

Public policy is an action (or non-action) that is performed by the government or the legislature. However, not only the government or legislature can take part in the implementation of a policy. Societal actors also play a role. Some argue that public policy can be a decision made by the government while others expect more involvement. (Knill & Tosun, 2012, p. 5)

What is then the implementation of such a policy? Generally, policy implementation is the process in which a policy output is developed into a policy outcome. (Knill & Tosun, 2012, p. 149) Policy implementation can happen over time and agencies and institutions must work together throughout this process. (DeGroff & Cargo, 2009, p. 48) However, this is a rather straight-forward approach to policy implementation. Some argue that an implementation process always causes tension within society. (Smith, 1973, p. 201) This is also likely for a digitalization policy, as especially a clash between more experienced and confident users of digital tools, and the ones that struggle with the implementation can be expected. Additionally, it is also the target group (in this case

students) that influence the implementation. (Smith, 1973, p. 201) Social, economic, and cultural contextual influences can also have a significant impact on policy "success". (Gray, 2011, p. 224)

In the following, I will introduce a perspective on policy implementation that will be used in the analysis.

In the implementation process, many individual viewpoints will have to be considered. It is important to remember, that some actors are more powerful or influential than others as they have a bigger influence on the policy (implementation). Therefore, they have more power to shape the policy to their liking which in turn might disadvantage other actors. Moreover, when analyzing implementation, it must be kept in mind that relationships between the actors might influence the implementation as different relationships with powerful or less powerful actors influence the power of other actors that are part of the relationship. (DeGroff & Cargo, 2009, pp. 52-53)

2.3.1 Networked Governance and New Public Management

It is not only the circumstances and actors, that influence policy implementation but also how a policy is implemented. Networked governance is the first factor to influence policy implementation.

To understand networked governance, the distinction between network and governance must be made.

Networks develop when links between organizations and/or individuals strengthen. (Keast, Mandell, Brown, & Woolcock, 2004, p. 364) They are cost-saving and allow the actors to create a strong force to solve complicated problems. (Borgatti & Foster, 2003, p. 995) Therefore, especially in a time of rapid change, which is especially the case for digitalization, a policy should be implemented in a rather flexible way. The Digitalstrategie is a policy aiming to adapt to existing and complex structures that have formed at universities over the decades. As technology is rapidly changing, so do the demands of students to improve the digitalization at universities. Hence, the policy needs to be able to react to changes and have long-lasting goals to ensure building an infrastructure that can adapt to the changes.

Governance, in the abstract sense, is a concept in which actors (individuals, companies, states, etc.) organize themselves to achieve decisions and goals. However, looking at it more narrowly, governance is not just a way to coordinate it is more the reliance on the structure of a *network.* Governance in political science initially described the ruling via hierarchies. However, this notion of governance got challenged in the 1980s. Today, governance describes interaction (formal and

informal) between public and private actors that go through a well-coordinated decision-making process to create policies with a democratic ideal, that have a realistic account when governing society and the economy. To form a clear differentiation between non-hierarchical forms of governance, the term n*etworked governance* emerged. (Hollstein, Matiaske, Schnapp, & Schnegg, 2017, pp. 250-251)

It describes how policy implementation needs to be managed between multiple actors, including political, administrative actors as well as so-called implementers. These actors all influence the implementation of a policy. Political actors can be ministers that bring up the idea of a policy, while administrative actors can be the ones creating the policy paper and the so-called implementers are the ones that implement the policy. Those can be agencies tasked to do so (in this case the Digitale Hochschule NRW) and the institutions that the policy is implemented in (universities). All these actors must cooperate to achieve the goals that the policy has set. If actors do not agree on the goals tensions may arise and the implementation of policy can become rather problematic. The networks of political, administrative actors and implementers can differ widely in size, structure, and/or complexity. Through a diverse structure, implementation can be decentralized, and strategies can be coordinated by the agents. A diverse structure is the use of partnerships not only with governmental service providers but also with private entities such as private advisory companies. (DeGroff & Cargo, 2009, pp. 51-52)

Next to Networked Governance, New Public Management is also a way to assess and enhance policy implementation. New Public Management is a way of management and is opposed to Traditional Public Management.

New Public Management is focused on consumers and aims at service provision. A part of New Public Management is the principal-agent theory. (O'Flynn, 2007, p. 354) However, there is also a third and newer management approach, which is Public Value Management. Here, the manager is an active leader, who is trying to steer the network of actors towards goals. In addition to that, the public is more included in the process. (Stoker, 2006, p. 45)

The role of managers, that are responsible for the implementation of policies in new public management, is based on the outcomes rather than the output of a policy. Its goal is to assess management and policy effectiveness and means of accountability. (DeGroff & Cargo, 2009, p. 55)

Hence, another sub-question for the paper emerges: *Which management approach is influencing the Digitalstrategie?*

2.3.2. Measuring policy success

Policy success is a widely used term that has not attained a universal definition yet. When people hear the word (policy)success they automatically assume good consequences. (Begley et al., 2019, p. 188) But what is policy success? Even though the term success implies an overall favorable outcome, success, especially policy success, is rather a spectrum.

Some have come up with a more defined definition of policy success. McConnell argues that policy success happens when the goals, that are set to achieve, are not criticized but rather supported. (McConnell, 2010, p. 357) Compton and Hart have chosen another approach for policy success. They claim that a policy is successful if it solves the problem that it was created for and creates social value. (Compton & Hart, 2019, p. 4) Nevertheless, policy success is always up for interpretation as the term has many values and beliefs attached to it. Creating a coherent and universal definition of success is therefore rather complicated. (Gray, 2011, p. 223)

When talking about policy success, policy failure is inherent. Policy failure occurs, when a policy does not achieve the goals it was supposed to, or the policy gains great opposition and no support. (McConnell, 2010, p. 357) However, policy failure can already happen, when the policy is not successful in fundamental aspects and only shows success in some of the goals it was set out to achieve. (Dunlop, 2017, p. 5)

There is always a positive outlook to be gained from failure as well. Even if a policy has failed, policymakers can gain information from that failure, essentially leading to policy learning. The learning process is more likely to lead to a change of values and beliefs which will then in turn, influence future policies and possible success. (Dunlop, 2017, p. 5)

When assessing policy success, it is much more beneficial to analyze separate categories to determine exactly what has or has not failed. (Newman, 2014, p. 193) A policy is usually defined by the process dimension, the programmatic dimension, and the political dimension. While the process dimension is concerned with the legitimacy, political sustainability, and innovation, the programmatic dimension is concerned whether the policy was implemented according to its original objectives, whether it achieved the intended outcomes and if the implementation benefitted a specific target group. Moreover, it is also concerned with the use of resources. The political dimension is concerned with government popularity. All those dimensions are entwined but can be analyzed separately. In this paper, the focus will be set on the programmatic dimension, mostly focused on the target group. (Marsh & McConnell, 2010, p. 571) Opposed to that, other approaches

have been emphasized when assessing a policy. Newman argues that a policy should be divided into four separate areas instead of three dimensions. The process area, in which certain goals and statements are transformed into instruments. The goal attainment area, like the programmatic dimension. The distributional outcome, which analyses the policy benefits or who is losing possible benefits. The fourth area is policy political consequences, meaning the public opinion as well as electoral outcomes. (Newman, 2014, p. 192) The distributional outcomes will be a focal point of this study. The indicator of success in this category is whether certain groups benefit and in how far they benefit from the policy. (Newman, 2014, p. 197)

A policy is always restricted by its circumstances, including the actors, which are affecting its outcome (locals institutions, partisan politics,…) (Newman, 2014, p. 193) Nevertheless, assessing a policy is vital for agents as well as politics. In this research, circumstances, as well as actors, will have to be closely analyzed to identify factors, that influence the outcome and even the initial structure of the policy. Success and failure cannot be clearly defined. Hence, the terms are more likely to be found on a spectrum. McConnell has developed such a spectrum. From success to failure there is program success, resilient success, conflicted success, precarious success, and program failure. (See Appendix E) This paper will mostly focus on whether the achievement of desired outcomes and the benefit for a target group match. (McConnell, 2010, p. 354)

Therefore, the term “success” is rather undefined in this research. However, in this research, the term “success” will be closely related to whether the policy benefits students as the target group.

To conclude, for the assessment of the Digitalstrategie the analysis must pay a stronger interest in the circumstances that affect the implementation of the policy. These circumstances can be the infrastructure at the university or even the differences between universities that make the goals of the policy unachievable for one university while others have already implemented it. Additionally, as this paper focusses on students, one must identify whether they approve the goals of the policy. Furthermore, when assessing the success of the policy, it was made clear that it is not a simple yes or no question but rather a very complex term that is influenced by multiple values. In this research, one will use the spectrum introduced by McConnell to apply the policy on the spectrum of success. The focus will be on whether the policy benefits the target group (*students,* universities).

To be able to answer these questions, sub-questions were determined:

Is the policy successful, in terms of meeting the expectations and demands of students? (Or: Does the policy benefit the target group?)

3. Methods

The research is done via a mixed-method approach. Qualitative interviews, as well as a document analysis, were conducted. Additionally, a quantitative survey amongst university students was done. Essentially, making it a triangulation approach. This approach enables a broader data collection and reduces possible data bias as well as investigator bias. (Oppermann, 2000, pp. 142-143)

3.1 Interviews

The conducted interviews were semi-structured. The interviews were held with four students, with two employees of the ministry of economy, digitalization, and innovation as well as the responsible employee for digitalization at a university in NRW and an employee of the implementation agency "Digitale Hochschule NRW".

As the study aims at students' perceptions of digitalization, most of the interviews were focused on them. Participants were studying at different universities in NRW to gain a broader understanding across universities. Moreover, students were in different years and across the fields of economy, language studies, public governance as well as biology to capture a broader insight into the different standards of digitalization across disciplines. The interview was structured into four parts. The first part was designed to get to know the student and whether they think that their university and their professors are well equipped in terms of digitalization. The second part was designed to gain an insight into the tools that students use and whether they receive any support from their university when using these tools. The third part was designed to compare the aims of the policy with the perspective of university students. General questions were included: "Would you like more digitalization in your studies?" to" Are you satisfied with the online library of your university?" The fourth part was concerned with problems that students encounter with digitalization and whether it has a negative direct effect on them or the teaching environment at their university.

The interview with the employee at the University was mainly conducted to assess the quality of learning and studying being influenced by digitalization. This includes problems that are experienced in the digitalization process. The interview was structured into three parts: The first part was concerned with the positive and negative effects that digitalization has on universities and the tools that they are currently using. The second part was concerned with the aims of the policy and whether the university deems them as realistic. The third examined the differences between universities and the future of universities.

The interview with the ministry was conducted as they were responsible for overseeing the implementation progress as well as the policy's status. An interview with the ministry of culture, which is responsible for the implementation and oversight of universities specifically, was declined by the responsible contact. An inquiry for another contact was also declined. The interview with the ministry of economics, digitalization, and innovation was structured in four different sections. Questions about the starting point concerning digitalization in NRW, the policy process, students' concerns at universities in NRW as well as questions that were based on the document analysis.

The interview with the implementation agency was conducted to gain a broader understanding of the policy process as well as the digitalization of teaching and learning at universities. Which troubles did universities encounter? Does the policy meet its target? Moreover, the interview was structured into three parts: the current status of the implementation, questions concerning the aims of the policy, and questions that were gathered from previous interviews with students such as how they plan to support teachers that are not as open to the digitalization process.

Seven interviews were conducted and will be referred to in the following as such:

Table 1 *Interviews*

Interview	Interviewee
Interview 1	Student 1
Interview 2	Student 2
Interview 3	Student 3
Interview 4	Student 4
Interview 5	Employee at university
Interview 6	Digitale Hochschule NRW
Interview 7	Ministry of economy, innovation, digitalization, and energy NRW

3.2 Survey

The survey aimed at students at a university in NRW. In total, 74 answers were collected. Therefore, no statistical inference can be drawn from the survey. Nevertheless, it enables a broader insight and supports the interviews. Students had to be enrolled at the university to participate in the survey. Before the survey launched, a pretesting with three outside reviewers was done. This enabled the survey to be adjusted to the reviewer's user experience. (Sue & Ritter, 2012, p. 23) The survey was distributed via various social media platforms. These include WhatsApp, Facebook, Instagram.

Especially Facebook was useful, as the students were already organized into groups and could be contacted directly.

The survey was designed to take around three minutes to minimize opt-outs. Students were asked to answer which digital tools they were using at their university, as well as the frequency that they use them. Additionally, participants were asked to estimate whether their university was ready for a digitalization change. Lastly, students were asked about the measures that the policy has planned and whether they deem them necessary or helpful. This structure was chosen to assess the current status quo, gain an understanding of whether students think that enhanced digitalization is possible, and if the policy's measures are welcomed. The survey was designed to support the interviews that were previously taken.

3.3 Document analysis

For the document analysis, the policy paper was used and compared with the digitalization policies of three universities in NRW. Additionally, the statement paper of the Digitale Hochschule was used to compare their stance with the goals of the policy.

Firstly, the policy paper was analyzed to gain a more thorough understanding of the aims and goals, as well as the parts of the policy that were not as clearly defined as others. When analyzing the other documents, reoccurring themes were identified (see table 2) and compared to the policy document of the Digitalstrategie.

3.4 Data analysis

The interviews were analyzed by finding patterns and themes in the answers. The survey data was imported from Qualtrics, where the survey took place and then analyzed with SPSS. As the answers from multiple-choice questions were imported as separate variables, multiple response datasets were coded. The data was then analyzed with frequency analysis. One question in the survey concerned the importance of platforms to university students. The importance could be set on a scale from 0 to 100. <50 being not important <80 being important and >80 being very important.

4. Results

In the following, I will present the results of the document analysis and the survey. Hereby, the interviews will be used to gain a broader understanding of the context. The interview of the university will be used to explain the survey, as well as the interviews of the students. The interview of the ministry and the implementation agency will be used to understand their documents.

4.1 Document analysis

For the document analysis, several papers were analyzed. Firstly, the policy paper of the Digitalstrategie was analyzed to gain a broader understanding of the policy. Moreover, the statement paper of the implementation agency. In addition to these papers, the aims, and targets of three universities in NRW were used. Ruhr-Universität Bochum, Universität Duisburg-Essen, and Heinrich-Heine-Universität Düsseldorf. The universities will not be treated as one actor. Rather, their policies will be compared, and similarities and differences will be analyzed (see table 2). The analysis of the policy of the implementation agency will be investigated separately from the universities. To conclude the document analysis, the standpoints of the different actors will be compared to the Digitalstrategie.

Table 2 Themes of the policy documents of universities

Theme	*f*
Flexibility	3
Being present at university (“Präsenzuniversität”)	3
E-Assessment	3
Supporting teachers	3
Open educational resources	1
Open Access	3

4.1.2 Position of the Digitalstrategie NRW

The document analysis focusses on how the starting situation is described in the policy, the goals that the policy document sets, and the measures that the policy aims to achieve these goals.

The Digitalstrategie is divided into several “Handlungsfelder” best translated to fields of action. One of these “Handlungsfelder” is education. Education is then divided into several stages of education, with one of these stages being digitalization at universities. (Landesregierung NRW, 2019, p. 26)

Universities were included in the policy as NRW has many universities that inherit the potential to bring the "Bundesland" forward. "There really is a very high density of […] Universities in NRW. […] there, great things are happening." (Interview 7, ll.43-37)

The goals, that the policy has set for universities, are to install active learning via digital tools, new ways to access education as well as to enhance competence and service in the universities' teaching, learning, infrastructure, and administration.

A reoccurring theme in the policy document is "competence". It is used as the basis of using those digital tools: "Competencies are crucial for participation in knowledge and communication" (Landesregierung NRW, 2019, p. 22)

Moreover, higher education institutes also must teach competences. "Institutes have to teach digital competences for the use of digital tools […]" (Landesregierung NRW, 2019, p. 22)

Additionally, an online portal for e-learning will be established. To ensure competency, a data literacy education will take place and 120 fellowships for digital education will be established. These digital fellowships will be implemented until 2021 and are supposed to support new ways of teaching and learning methods. Moreover, teaching and learning as well as e-assessment formats will be tested. Students will be supported by universities to use new tools. To do that a data literacy program will be established. (Landesregierung NRW, 2019, p. 27)

Another reoccurring theme is open-educational resources. These open-resources are crucial for good online services as well as ensuring a wide-use of those sources. Additionally, the Digitalstrategie mentions the use of open access. Until 2021, a strategy to support open access and open science will be established with the Digitale Hochschule. (Landesregierung NRW, 2019, p. 27)

The policy aims at fulfilling these goals by investing 50 million Euros per year while reducing it to 35 million per year starting in 2022. The goal is to influence teaching, learning, infrastructure, and administration. However, no clear plans as to how the investments are made are mentioned.

The policy document does not explicitly state the starting point at which the policy plans to intervene. It states, that digitalization is more of a vision and *more* measures need to be taken to ensure more growth, wealth, and inclusion. (Landesregierung NRW, 2019, p. 3)

Overall, the policy document mostly aims at creating platforms for teaching and learning as well as developing competence to create the infrastructure that is needed to implement digitalization in a

university. The question remains how open sources are supposed to grow and whether those measures taken will lead to easier access.

The policy rather resembles an agenda because it lacks a clear plan and measures.

4.1.3 Position of the Digitale Hochschule NRW

The Digitale Hochschule NRW is responsible for the implementation of the policy. It is partly funded by the government and the universities that are part of the cooperation and the implementation agency. It will be active until the end of 2021, after which the board will decide whether it will remain active. The paper defines three spheres that the implementation agency is responsible for. The sphere of studying and teaching, administration, and digital infrastructure. Their overall strategy is to create strategies, cooperation, and projects to enhance innovation and create long-lasting effects of digitalization at universities. (Frommer, Klapper, & Stegemerten, 2018, pp. 2-3)

“Together we are stronger, innovation via cooperation.” (Interview 6, ll.14-17)

In the sphere of studying and teaching, flexible access to study material is desired. The skills that students acquire in this process of digitalization are supposed to enhance their chances at the job market and increase responsibility. It is not further defined what responsibility means here. (Frommer et al., 2018, p. 4)

The implementation agency aims at technical support for teachers. Moreover, the support of peers and help in matters of legal questions is planned. (Frommer et al., 2018, p. 4)

Especially for older teachers, competence-development is enhanced.

“[…] the problem that especially the older generation is not as digitally advanced, is already known. […] here we try to support them with competence-development […] you can look for experienced peers that can help you.” (Interview 6, ll.119-124)

Based on these aims, several measures are mentioned. First, a general website with central and decentralized elements, such as an already established Studiport and new systems such as a streaming platform, is planned. (Frommer et al., 2018, p. 4)

This website is supposed to help students find offers for teaching and learning. Moreover, it is designed to bundle up activities of all universities in NRW. However, there are technical as well as communicative and logistic challenges to be tackled. (Interview 6, ll.208-215)

One of these challenges are the differences between universities. “There are different approaches and the subject cultures are sometimes very different.” (Interview 6, ll. 165-166)

The interviewee also mentions that students need to be equipped with terminal devices to be able to use the new services. Therefore, structures to lend laptops, tablets, and so on must be established first. (Interview 6, ll.326-330)

The most important project for this paper is the OER-Platform, which is supposed to enable a university-wide sharing of open educational resources. Moreover, the assessment of students, which is supposed to be implemented via the project e-assessment. (Frommer et al., 2018, p. 5) Open educational resources are a rather complicated question. Libraries of different universities must work together (Interview 6, ll.273-274). Which the interviewee deems difficult as universities are very different in their evolvement of digitalization (Interview 6, ll.168-171). If open access and open resources are to be implemented, several copyright questions have to be answered first and review-structures must be implemented. (Interview 6, ll.283-291)

In the sphere of administration, the paper defines the process as challenging because many “Vorarbeiten” best translated to preparatory work must be done to be able to implement the aims. (Frommer et al., 2018, p. 6)

4.1.4 Position of the Ruhr-Universität Bochum

The Ruhr-Universität Bochum has a separate digitalization policy on the administration and one on the digitalization of teaching.

In the digitalization policy for the administration, the university states that digitalization for them is not a goal. It is rather an instrument for making the university ready for the future. (Ruhr-Universität Bochum, 2019, p. 1) The policy aims to use the digitalization to make their services flexible to be independent of time or place (Ruhr-Universität Bochum, 2019, p. 1)

In the policy for teaching, the university mentions the flexibility of studying again. The policy aims towards flexibility to make studying family-friendly and more heterogenic in terms of learning supply. Moreover, they also claim that digitalization brings new teaching concepts. (Ruhr-Universität Bochum, p. 1) Their main goal is to be competent to be able to use digital tools and media to enhance their studying. However, it should be used in the context of combining presence at university and digital support. (Ruhr-Universität Bochum, p. 1) Additionally, the university wants to integrate e-assessment to help inform students about their learning progress and for teachers to

develop their teaching strategy. The overall goal of e-assessment is to accompany a high degree of individualization and reduce outlay. The goals of the university are inclusion as well as internationalization, to allow entrance to international teaching and learning formats. Lastly, the university aims at improving the digital infrastructure. However, it is not a priority and will only be improved if it will enhance the quality for teachers and students. (Ruhr-Universität Bochum, p. 1)

4.1.5. Position of the Universität Duisburg-Essen

The university defines digitalization as a chance to innovate. Moreover, the process goes beyond e-learning. New technologies are supposed to create innovation, flexibility, and develop a connection between different actors. Students are the focus group of the digitalization process to prepare them for the demands of the job market, which include the use of digital tools and social competences. There is no mention of the tools that will be used to meet those goals. (Universität Duisburg-Essen, 2017, p. 2)

The university defines two more challenges and goals to support teaching and learning. The first one is to enhance the e-learning environment by reworking the existing teaching concepts. Teachers ought to be supported by service-, support-, and qualification offers. The second challenge is to provide frequent feedback while acquainting a rising number of students. (Universität Duisburg-Essen, 2017, p. 2)

Moreover, the university has defined two overarching goals. Firstly, the university should open itself to more diverse teaching and learning approaches to accompany different living situations and make studying more flexible for students with jobs or family responsibilities. Secondly, the curriculum should be developed to minimize study delays. Digitalization is thereby an instrument to identify new teaching and learning approaches. (Universität Duisburg-Essen, 2017, p. 3)

Next to service provision, e-assessment, and new curricula, open educational resources are desired to enable easy access to useful material. However, the copyright must be managed first. (Universität Duisburg-Essen, 2017, pp. 4-6)

4.1.6 Position of the Heinrich-Heine-Universität Düsseldorf

The Heinrich-Heine-Universität wants to use digitalization to make teaching more flexible. By using digital teaching and learning opportunities, new target groups can be acquired. Further, digitalization offers non-typical students the opportunity to combine studying with their family and job. Additionally, student mobility and internationalization can be enhanced by using digital tools.

(Heinrich-Heine-Universität, 2018, p. 2) By using digitalization, students shall be prepared for the job market (Heinrich-Heine-Universität, 2018, p. 5).

The university insists that students should still be present at the campus and improvement of digitalization should only happen when it benefits the university. Digitalization is a tool to reach goals. In the administrative sector, the university sees the chance to automatize processes. (Heinrich-Heine-Universität, 2018, p. 5)

To adjust the digitalization process to students' demands, several measures, including e-assessment will be taken. (Heinrich-Heine-Universität, 2018, p. 7)

The university defines three main plans for studying and teaching. Firstly, eOnboarding, which is the provision of access to materials to enable students to have the same chances when learning and studying. This also refers to open educational resources. Secondly, the eLearning aspect, which supports the teaching and learning process. To support teachers in e-learning, already successful teachers will function as multiplicators, sharing their knowledge with their peers. Thirdly, e-assessment to control the individual learning progress. (Heinrich-Heine-Universität, 2018)

As digitalization offers new possibilities for literature research and analysis, the university wants to start the "digital education library" project. (Heinrich-Heine-Universität, 2018, p. 10)

4.1.7. Comparison of the positions with the Digitalstrategie

The implementation agency Digitale Hochschule NRW aims to make studying more flexible, meaning that it is not dependent on a specific place or timeframe. (Frommer et al., 2018) The policy paper does not state flexibility clearly. However, it mentions that structures should be "bedarfsgerecht" which loosely translates to needs-based. (Landesregierung NRW, 2019, p. 26) All the other three universities explicitly name flexibility. The Universität Duisburg-Essen wants flexibility for students, so they can combine their studies with their jobs. (Universität Duisburg-Essen, 2017, p. 7) However, what the policy document does not mention, is the importance of presence. All university documents pledge for the so-called "Präsenzuniversität" (being present at university). Another aspect that does not gain as much attention in the policy document as it does for universities, is the e-assessment. Via e-assessment, students can check their progress and receive valued feedback which can significantly improve their grades. (Heinrich-Heine Universität, 2018, p. 9) All universities mention e-assessment. Therefore, the topic seems to be a focal point in the digitalization process. However, the policy paper does not explicitly pay attention to that. What should be done to preserve a "Präsenzuniversität" and not risking it to become a distance university?

Nevertheless, not all universities extensively mention the digitalization of teaching and the support that teachers need to implement new digital teaching strategies. What the policy paper calls “digital fellowships” (Landesregierung NRW, 2019, p. 27) the “Digitale Hochschule” defines as technical support as well as support from other teachers for other teachers (Frommer et al., 2018, p. 4). The Heinrich-Heine Universität wants to create incentives for teachers to include more digital tools in their lectures. Moreover, they aim to use teachers that already use digital tools in their lectures as multiplicators. (Heinrich-Heine Universität, 2018, p. 9)

Another important aspect are open educational resources. The policy document names them last, but all universities want these resources to expand. The Ruhr-Universität Bochum aims at creating a “Bildungskooperation” where multiple actors come together to share information and material. (Ruhr Universität Bochum, p. 1) The Universität Duisburg-Essen aims at creating open education resources (Universität Duisburg-Essen, 2017, p. 7) and the Heinrich-Heine Universität aims at creating a digital education library (Heinrich-Heine Universität, 2018, p. 10).

4.2 Survey results

The survey results are given context by the interviews with students and the university. The following section is structured to show the perception of digitalization, students’ use of tools, their skills, and their perception of a federal-wide online platform for universities.

4.2.1 Students perception of digitalization at university

According to the survey, the majority of students think that their university is not prepared for the digitalization (see table 3).

Table 3 *Students perception of digitalization*

Do you think that your university is prepared for the digitalization?

		Frequency	Valid Percent
Valid	Yes	23	33,3
	No	32	46,4
	Maybe	14	20,3
	Total	69	100,0
Missing	System	5	
Total		74	

Opposed to this, in the interviews, students mostly thought that their university was prepared for the digitalization. One student mentioned that their university is not prepared as they still use "old-fashioned" teaching methods.

"Most [teachers] still work with overhead projectors. […] More is possible." (Interview 1, l.11)

Another student also mentions that it depends on the faculty, whether the digitalization process is going well. (Interview 2, l.8)

The differences within a university are also mentioned in the interview with the university.

"The best example is mathematicians and chalkboards. It is oftentimes hard to […] convince people for the alternatives […]. On the other hand, at the faculty of law, the topic lecture recording is already established. […]." (Interview 5, ll.451-456)

When asked about their teachers, most students say that they are generally happy. However, some teachers are unwilling or unable to implement digitalization in their teaching methods.

"I have some teachers that do it because they have to. […] It always depends on the lecturer." (Interview 2, ll.29-37)

"I have a professor that […] that does not even connect the laptop himself. […] I think that younger ones [teachers] would do better." (Interview 1, ll.38-51)

"[…] and he [teacher] wrote his lectures on an overhead transparency and we hat to copy it. […] nothing was uploaded. But I had professors that uploaded everything as well." (Interview 4, ll.23-26)

"And they sometimes do not know how it works. We had a lecturer […] who did not even know how to share data via Airdrop." (Interview 3, ll.113-117)

4.2.2 Use of tools

Of the survey participants, most use platforms for study organization, and literature. Only 12,7% use them for exams and e-assessment. (See Appendix B)

In the interview two students used e-assessment. For them, the e-assessment is helpful as they can collect points for the exam. (Interview 3, ll.245-250. Interview 1, ll.58-61)

One student had to fill out a questionnaire online as part of an online module, that falls into the category of e-assessment, that the student was not happy with.

“But I could have gotten the overview [that they got in the assessment] by googling once.” (Interview 2, ll.327-328)

In terms of platform use, students value the platform for study organization most. However, they also prefer websites for communication and they also frequently consult Google (see table 4).

Table 4 *Importance of websites for students*

Statistics

		Google	Website for Study organization	Communication Website	Online library
N	Valid	67	65	59	61
	Missing	7	9	15	13
Mean		76,0299	85,1538	74,8983	65,6230

Importance of websites on a scale of 0-100

The online library is still important for students. However, it only comes in fourth place. In the interview, one student mentions that their online access is too complicated, therefore they rather go to the library to lend the book.

“[…] I have always done the [literature] research and then drove to the library because I do not want to do this shit. [online access to library].

There is only a limited resource of books online and different apps must be downloaded. Moreover, not every resource is available via a VPN. (Interview 2, ll.202-247)

Two other students are satisfied with their online library. However, they would like more books, especially older ones, to be available. (Interview 1, ll.147-154. Interview 4, ll.226-232)

When students are asked about online lectures, the fact that they can go back and learn at their speed is what they liked the most.

“Because it is a lot better when you watch a video, and you can see what you have to do. Instead of reading a protocol that you do not understand […]” (Interview 4, ll.436-440)

“It is very handy […] that I can listen to things [lectures] three times and always go back [until] I understand it.” (Interview 1, ll.258-261)

“You could have the audio synchronized to the lecture. That was amazing […] or for the preparation of an essay.” (Interview 2, ll.90-95)

However, students also prefer the classroom. They want it to be more interactive (Interview 1, ll.278-279) and like the discussion with the teacher and their fellow students (Interview 2, ll. 546-556).

The interview with the university reveals that even though, they support digitalization, some parts are harder if not impossible to digitalize.

"You can digitalize knowledge transfer […] well. The […] real discourse cannot be easily digitalized." (Interview 5, ll.44-47)

4.2.3. Students perception of a federal-wide online portal

Table 5 *Perception of the federal wide online portal*

Would you find a federal-wide online portal useful? (Video courses, online lectures, online learning material)

		Frequency	Valid Percent
Valid	Very Helpful	23	32,9
	Helpful	36	51,4
	Less helpful	11	15,7
	Total	70	100,0
Missing	System	4	
Total		74	

84,3% of participants said that a federal-wide online portal would be *helpful* or very *helpful* for them. In the interview students also generally approved of the idea (see table 5).

However, one student mentions the problem of sharing learning and teaching material as there might be differences between the topics that they are taught. (Interview 1, ll.189-204)

On the other hand, another student even wants it to be nation-wide.

"I would think it is good to make a nation-wide pool for the exercises." (Interview 3, ll.564-565)

4.2.4. Students perception of their skills

When asked whether students think that they are well prepared for the digitalization of their university, they say that they can accommodate any changes rather quickly and efficiently.

"[…] I would have to work with it. But we belong to the generation that has taught themselves [to work with digital tools] anyways." (Interview 1, ll.135-137)

However, the interviewee also mentions a problem concerning the hardware.

"At university, I would say that every student has a laptop […] but that has to be checked […] so that everybody can use it." (Interview 1, ll.301-304)

In the survey, most participants wanted more support from their university to use the platforms that are available instead of learning it only by themselves (see table 6).

Table 6 *Support to use platforms*

Would you like more support from your university to use the platforms?

		Frequency	Valid Percent
Valid	Yes	36	51,4
	No	26	37,1
	Different	8	11,4
	Total	70	100,0
Missing	System	4	
Total		74	

When asked about support from the university in the interviews, students are rather uninformed and skeptical as these are time-consuming and happen on campus.

While one student did not know which courses were available. (Interview 4, ll.161-163)

Another student complained that the courses cost money and are very inflexible in terms of time and place (Interview 2, ll.145-148)

"I never used them [the courses] because they cost money and the time that they start at is very complicated if you do not live close-by." (Interview 2, ll.145-148)

When asked about the negative effects that digitalization has on the lecture and the quality of teaching, most students think that digitalization does not have a negative impact on lectures (see table 7).

Table 7 *Platforms in lectures*

Do you think that the platforms can have negative consequences in the lectures? (Disruption, problems with equipment, worse teaching)

		Frequency	Valid Percent
Valid	Yes	18	25,4
	No	40	56,3
	I don't know	13	18,3
	Total	71	100,0
Missing	System	3	
Total		74	

However, when asked specifically, in the interviews, students mention some problems with their teachers, as we have already discussed in an earlier section.
An additional problem that is mentioned by one student is the frequent switch between offline and online tools used in the lecture, which creates a disruption of concentration in the classroom.
"[…] that was this lecturer who constantly switched between different things. […] and you noticed that the concentration was lacking in the room." (Interview 4, ll.450-457)

Even though the data implies that students do not think that these platforms have a negative influence on the lectures, they do think that it can have negative consequences on their concentration (see table 8).

Table 8 Negative effects

Do these platforms have negative consequences on your concentration?

		Frequency	Valid Percent
Valid	Yes	35	49,3
	No	27	38,0
	I don't know	9	12,7
	Total	71	100,0
Missing	System	3	
Total		74	

When asked about negative consequences for themselves, students mention pressure from always being available (Interview 2, ll. 587-595) and having the feeling of missing out (Interview 2, ll. 567-577).

Moreover, an interviewee mentions being distracted. However, they also add that that makes no difference in studying on paper, where you also get distracted (Interview 1, ll.316-323).

5. Discussion

The most interesting result is that teachers influence the implementation of digitalization heavily. The data indicate that even though structures exist if teachers do not use them, they will not be passed down to the student. If that happens, the policy fails, as most services will not be used by students (e-assessment, online lectures, support structures, etc.). This adds to the findings of Kim et al. (2013) that teacher's beliefs influence their use of technology. Hence, it is in the interest of a successful policy to support teachers via the digital fellowships and other support systems to change their beliefs and enable technology to be implemented in the classroom. It remains debatable whether these support systems can truly change the beliefs of teachers as the results indicate that it is not easy to change teachers who do not feel that change is necessary.

Even though the documents indicate that flexibility is an important factor in the digitalization of universities, students do not mention it once. However, the results indicate that universities want flexibility for students to be able to combine family and job life. Hence, they are also aiming at a specific group of students. Therefore, it is for future researchers to investigate the group of students that want to combine their studies with their family and jobs and whether they mention flexibility as an important factor in their study.

Furthermore, the results indicate that digitalization is not a goal but a tool to achieve more services that are in line with students' demands. Therefore, it remains debatable, whether digitalization generates flexibility or if tools make studying and teaching more flexible. if they do, it must be found out, in how far the different tools make studying flexible.

The results show that students like e-assessment, especially if it helps them with their results in exams. However, online assessments need to be informative and grant more than a Google search can. This is in line with Higgins et al. (2012) who argue that it depends on how the tools are implemented and used. Tools only have a successful application if they are useful to students.
Do students prefer a blended learning approach? Students like that they can use e-assessment and they also prefer online lectures to improve their studying. However, students also value being at university and engaging in discussion. This is also in line with universities' wish to preserve the so-called Präsenzuniversität. However, it should be carefully assessed, which parts of the teaching and learning are to be digitalized. As it has been indicated in the interviews, that some parts, such as the discourse, are not as easily digitalized as others. This is also in line with Selwyn's (2016) findings, that technology can lead to lower quality of teaching, the so-called detriment. Moreover, it is also

in line with Ghemawat (2017) that the two spheres of digital and face-to-face education should be carefully assessed and not just be “mashed” together. To conclude, the blended learning approach of universities and the Digitalstrategie is efficient in serving student’s needs, but it should be in line with the quality provision of teaching.

Moreover, the results show that students want more support in using the tools that are given to them. The results from the interviews indicate that students want these offers to be easily accessible, this can be a short video or a quick written tutorial. These tutorials serve as an aid for students to mostly get to know the tools themselves. This is in line with Saljo (2010), who stated that students are used to technology and able to teach it themselves. Support for students is included in the Digitalstrategie. But universities are supposed to support students in this matter. However, if the teachers do not support digital teaching, it will be complicated to implement these support structures. Moreover, students want support to be easily accessible and fast. Hence, support structures need to be assessed to these wishes. The provision of terminal devices, which was mentioned in the interviews, is not included in the Digitalstrategie.

The results also show that students use their study organization frequently and it is important to them. The results line up with Thoring et al. (2017), who claim that study organization is amongst the most valued services. Hence, the study organization should be a vital focus of the Digitalstrategie.

The data confirms that online libraries are important for students. They want as much online literature access as possible. This is also in line with the findings of Thoring et al. (2017), who state that literature provision is among the highest valued services for students. In terms of open access, which would enhance the literature provision of an online library, the topic is more diverse as it seems at first. It will be problematic to significantly widen open access as it is not only a budgetary issue, but it also demands negotiation with publishers. The sub-question: Which tools do students use at university? can be answered with, mostly tools for study organization, communication tools, Google, and their online library. However, these tools need to be easily accessible, as too many obstacles lead to students rather not using the tools at all.

Students also experience negative effects, mostly concerning issues with their concentration. This result builds on the existing evidence of Selwyn (2016), that students experience negative effects on their concentration that can even influence their grades. Hence, students need support in dealing with the changes in the learning environment that supports them also in these psychological

matters. A topic that is not entirely covered by the Digitalstrategie. Another sub-question: Do students feel any negative effects? Is also answered. Yes, students do feel negative effects, mostly on their concentration and the pressure from always being available, however when it comes to studying online, they do not feel any difference from the analog way of studying.

The analysis confirms that students would appreciate a federal-wide platform. Students expect a range of open educational resources as well as lectures. However, the remaining differences within and between universities are problematic to achieve a well-developed platform. The results show that universities must align their work to be able to provide services together.

Is the policy successful in meeting students' demands? It is successful, as it has included tools (such as the federal-wide platform) and is aiming at more literature, which the data has indicated students want. Additionally, teachers receive the support that they need so that the tools can effectively be implemented. However, the Digitalstrategie lacks in the planned implementation of support structures for students. It is also not clear on how to make open access possible. Additionally, even though open educational resources are desired, how will universities overcome significant differences in their structure and their process, and how can legal questions be answered? Universities are very different in their internal structures (courses, infrastructure, teachers) and their progress of digitalization. This is also affecting policy implementation. The results show that universities are powerful actors as they are part of the implementation agency. However, as they are still very different in their process of digitalization, they cannot become a stronger actor. This influences the aims of the policy such as open access and open educational resources, which can only be implemented if universities are a strong actor and if their digital infrastructures resemble each other. This is in line with DeGroff and Cargo (2009) who argue that stronger actors in the implementation process are more likely to influence the policy to a greater extent.

Where are the students in this? As the results show, students are the ones receiving the services that will be provided. They are the customers and the Digitalstrategie as well as the positions of the other actors, indicate that service provision for students is the goal. Moreover, as the Digitalstrategie mostly consists of universities and the policy resembles an agenda, which makes it weaker, universities have the most power in this network. They are part of the implementation agency and hence, not only influence the policy to a great extent but also its implementation. However, the complexity of the network also allows to implement as many standpoints as possible

which is in accordance with the findings of DeGroff and Cargo (2009), that through these networks, tasks can be decentralized.

Therefore, to answer the sub-question: Which management approach influences the implementation of the Digitalstrategie? It is not a straightforward answer that can be given here. Students are the consumers of services, such as the federal-wide platform, which is in line with the findings of Stoker (2006), who states that service provision is a crucial part of new public management. However, there is a complex relation between the universities, the government, teachers, and students. Where are teachers in this? On the one hand, they are recipients of the services that the policy provides. But on the other hand, they are also responsible for the implementation of a policy. The same goes for universities as they are not only implementing the policy, they are also part of its design. Moreover, as New Public Management also entails the principal-agent theory, which assumes that the contract between the principal and the agent will end at some point, it is important to remember that even though, the policy will end at some point, the government will be in constant touch with universities and cannot simply end the “contract”. Therefore, even though the policy implementation is leaning towards New Public Management, it cannot be clearly defined.

6.Conclusion

The main arguments that this paper has made are the findings that teachers are important multiplicators that influence the implementation process greatly. Moreover, students want more support to use tools and these should be easily accessible and self-explanatory. Lastly, I argue that the policy is an agenda-setter and universities are the actors with the most power. However, universities have to work on their differences to become a stronger actor that can implement their goals more efficiently.

Now that we are coming to the end of the paper, we should look at the overarching research question: How successful is the federalist organized Digitalstrategie NRW, especially concerning the positions of students against the opinions of stakeholders?

The Digitalstrategie does meet students' demands in so far that it plans to implement tools that will make it easier for students to access material and lectures. However, there is a gap between the policy and the students' demands. Moreover, it is difficult to combine the different standpoints of the actors. The government can only set the context as an agenda-setter, but universities must work together. Goals like open access and open educational resources can only be realized if universities become more similar in their digitalization progress to be able to provide uniform services such as the federal-wide online platform. When going back to McConnell's (2010) policy as a program spectrum, the policy success can be found in resilient success where some shortfalls are evident but the target group (students) mostly benefits (see Appendix E).

As this study had a small sample size, results cannot be generalized. However, they do give an insight into students' positions. Additionally, along with the interviews, the survey results still gave an insight into the context and the reasons why students like or dislike certain aspects of digitalization at their university.

Due to the Coronavirus, it was hard to find interview partners from universities as they were busy with the speedy digitalization that they had to implement to make an online-semester possible. Additionally, the decline of an interview request from the ministry of culture was problematic as they are the ones responsible for the digitalization at universities. The ministry of economics, digitalization, and innovation is responsible for the general oversight of the policy but could not give a broader insight into the digitalization at universities.

This paper gives practical implications for policymakers to establish stronger support structures for students that are easily accessible so that students can teach it themselves. Moreover, it implicates that teachers should keep getting the support to implement digital teaching and learning methods, especially those teachers that feel challenged by the ongoing digitalization. Moreover, the policy should include an agenda that aims to identify parts of teaching that should better not be digitalized to preserve the “Präsenzuniversität” that is desired by both universities and students.

Future research should emphasize the influence that teachers have on the implementation of digital tools. Preferably also with a bigger sample size of students and universities. Additionally, students needs need to be investigated closely to create better practical implications for universities, so that students can have better experiences with the digitalization at their university.
As a side note, it would also be interesting to analyze, whether the need for digitalization due to the Coronavirus has significantly improved the digitalization at North-Rhine Westphalian universities and if teachers and students continue to use the digital teaching and learning methods after coming back to university.

7. Reference list

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Appendix A

Documents

1. Position paper of the Digitale Hochschule NRW

Frommer, A., Klapper, F., & Stegemerten, B. (2018). Positionspapier der Digitalen Hochschule NRW zu den Handlungsfeldern Studium und Lehre sowie Administration und Infrastruktur Retrieved from https://www.dh.nrw/akteure/ueber-uns

2. Heinrich-Heine-Universität

Heinrich-Heine-Universität. (2018). Digitalisierungsstrategie der Heinrich-Heine-Universität Düsseldorf Retrieved from https://www.uni-duesseldorf.de/home/fileadmin/redaktion/Oeffentliche_Medien/Presse/Pressemeldungen/Dokumente/HHU_Digital_20181129.pdf

3. Policy paper, Digitalstrategie

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4. Ruhr-Universität Bochum

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