



Requirements, current status and recommendations on the Online Access Act (OZG) at German universities

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Abstract

The German Online Access Act (OZG) legally paves the way for the implementation of the EU regulation "Single Digital Gateway", which provides for digital availability of public services in the EU by January 2024. With this, the EU defines the standard for making public administration faster, more efficient, more user-friendly and consistently digital for citizens.

For the higher education sector, Germany has set up a coordinated implementation management for the so-called "study life situation", although universities are not a focus of OZG. Beyond the OZG, there are model projects in which digitised formats of data exchange are being developed in the national and European context. In addition, HEIs have used digitized solutions for study-related services such as application, admission, enrolment and administration of study and examination processes for quite some time.

An overarching study should now show the relationships between the various activities and at the same time outline what remains to be done to implement the OZG.

The study certifies that digital administrative services for students at higher education institutions can be described as far advanced. However, with regard to networking purposes of HEIs, especially with state agencies, important legal, institutional and technical prerequisites are lacking to allow for implementing the solutions already developed in model projects as extensively as possible. The study provides recommendations for action for decision-makers at federal and state level, universities and IT service providers and is important for a European discussion of the results because it shows the complex structure of the political multi-level system in the implementation of digitisation for the higher education sector. At the same time, it makes clear that

successful results can only be achieved through networking and involvement of all relevant levels and not through centralisation alone.

1 Introduction

The digitization of higher education in Germany has not only become a high priority since the beginning of the Corona pandemic. Whereas in research and teaching this was and is primarily about creating the technical prerequisites for online formats, digital university administration - albeit at a high technical level - is limited so far to "digital assistance for administrative processes as a simple transfer of analogue action routines into a new recording medium" (HENKE/PASTERNAK 2020). The paradigm shift in public administration called for in the European e-government community towards algorithmic decision-making processes, paperless exchange of documents, end-to-end workflows and networking with the state administrative level is only just at the beginning in German universities.

For example, the participation in initiatives for the mutual recognition of European qualifications, which has been promoted by the Federal Ministry of Education and Research (BMBF) in Germany for some time, is limited to a few pilot institutions on the university side. This also applies to participation in digitization projects for the development of formats for data exchange and a related networking of higher education administrations in the European area (cf. activities on ELMO: INIT 2020a).

The BMBF therefore took the entry into force of the nationwide Online Access Act (OZG) in 2017 as an opportunity to examine the prerequisites for implementing the above formats in the digital structure of HEIs as well as the broader challenges of implementing the OZG for the "study life situation" (Lebenslage Studium). In particular, the technical and institutional pre-requisites for interoperability between the universities and the federal states in the portal network should be clarified.

The institutions commissioned with the study - Kienbaum Consultants International (Kienbaum) and the HIS Institute for Higher Education Development (HIS-HE) - presented a comprehensive review of the current situation in mid-2020 as well as an analysis of its potential for further steps towards digitization in German HEIs (RUSCHMEIER 2020). The study provides answers to the content-related and functional requirements for IT infrastructures of HEIs and their interoperability with federal and state administration portals as well as HEIs at the European level.

2 Status of OZG implementation

Regulation (EU) 2018/1724 (SDG) on the establishment of a single digital gateway for access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012 was published on 21.11.2018. It is directly applicable law for the EU member states and the states of the European Economic Area. The regulation is part of the "compliance package", which is intended to make it easier for citizens and companies to carry out their obligations online vis-à-vis the authorities and administrations in their home country or in another of the aforementioned countries. With this initiative, the European Commission responded to the demands of citizens and businesses for an easier access to information, procedures and assistance and problem-solving services.

In Germany, the implementation of the SDG is ensured by the OZG. The OZG stipulates that approximately 600 services from the area of public administration are to be digitised by 2022. With the compilation of a so-called OZG implementation catalogue (LeiKa), administrative services have been bundled in 35 life situations and 17 business situations and grouped into 14 superordinate subject areas. The university-related services can be found in the service catalogue under the "study life situation". It comprises 89 services (as of October 2019), which have been assigned to eight clusters: 1) recognition of educational qualifications, 2) financial support (BAföG), 3) welcome money, 4) library and archive

services, 5) educational loans, 6) university admission, studies, examinations and certificates, 7) allocation of study places and 8) admission to traineeships (IT-PLANUNGSRAT 2021).

In addition to define the subject matter (= OZG administrative services), the organizational framework conditions for implementation had to be established. Compared to other European countries, this is not a simple procedure in Germany, since such a technically and temporally ambitious digitisation project requires leaving behind the traditional departmental responsibilities and processes of a hierarchical administration and establishing cooperation between the different political and administrative levels. Due to its legalistic tradition and administrative culture, as well as its pronounced institutional and organisational fragmentation, the German administration is often late in picking up on international reform trends - if at all - and generally has difficulty with inter-agency coordination (KRIMMER/SCHMIDT 2019). In addition, implementation requires addressability of responsibilities, especially when deciding on premises at the federal and state levels.

In concrete terms, the implementation organisation is based on two digitisation programmes, for which the responsibility lies with the Federal Government or the Länder or municipalities, depending on the legal regulatory and/or implementation competence. Strategic decisions for the digitisation programmes are made by an IT planning council - a body that was created for binding IT coordination of the Federation and the Länder by means of an international treaty. Independently of the participation in the thematic fields, the individual Länder themselves have defined responsibilities for the implementation of the OZG in their governments. (LÜHR 2020)

Since summer 2018, Saxony-Anhalt and the Federal Ministry of Education and Research have been responsible for implementing the OZG with regard to the administrative services of the "study life situation". The tasks include: Accompanying the development of portal solutions, designing standardisation requirements for data exchange in the XHochschule project and testing pilot solutions in so-called digital labs (RUSCHMEIER 2020). The XHochschule project, which is the focus of this activity, was only in the start-up phase at the time the Kienbaum-HIS-HE study was completed in early summer 2020, so that it was not yet possible to report on information technology requirements for a connection to portal networks in the study. However, the project has gained considerable momentum in recent months. In the meantime, a standardisation strategy (INIT 2020a) has been developed and agreed upon. Furthermore, a standardisation requirement (INIT 2020b) has been formulated, submitted to the IT Planning Council and adopted by it as binding.

The term "standardisation" refers to the actual objective of the project, which is to standardise the exchange of student data in the national higher education system, so that the necessary technical and semantic interoperability between the higher education systems can be established for a media-break-free processing of complete digital administrative services in the future. The XHochschule project team has also started a dialogue with HEIs, ministries of science of the Länder, manufacturers of specialised procedures and other stakeholders to jointly develop the requirements for the standardisation of a publicly accessible specification with PDF documentation and machine-processable files (XSD, XML) and to make the results publicly available. At the same time, a connection to system developments in other European countries as well as to parallel project work with similar issues in Germany (PIM, Digital Campus) is being maintained. As a result, a "specification is to be created that will provide universities with information on how cross-university data communication is regulated in the context of digitisation, so that it is no longer the students who move from university to university, but the data" (XHOCHSCHULE 2020a, XHOCHSCHULE 2020b).

As already mentioned, at the time the study was prepared, the XHochschule project had not yet been able to achieve any effectiveness in the public sphere - if one excludes a few pilot universities and strategic actors from the higher education or departmental area of the ministries responsible for higher education. The low level of awareness among HEIs and ministries at first is evidence of this. As a result, it was not least the study that generated this attention and, independently of the XHochschule project, which focuses on questions of technical and semantic interoperability, promoted measures with regard to the legal and organisational framework conditions of an implementation. In particular, the creation

of OZG coordinators financed by the state in the universities of North Rhine-Westphalia or the formation of a cross-university working group in Baden-Württemberg should be mentioned here.

In the view of the study, it is not least the legal, organisational and infrastructural conditions that form the framework for the professional and technical implementation of the OZG with the standardisation of XHochschule. These framework conditions of a political multi-level system with at the same time autonomous HEIs are presumably more complex in Germany than in other European countries and can help explain temporal differences in the speed of implementation of even European requirements (RUSCHMEIER 2020). In detail, the following results can be noted.

Legal framing

The analysis of legal regulations has shown that the OZG (or IT-related laws) - as used as a basis in the XHochschule project - cannot be used as sole the fundament when looking at the requirements for services in the "study life situation", for which the HEIs are responsible for implementation. Thus, higher education law provides the technical framework for almost all services relevant to higher education and also highlights the special responsibility and regulatory competence of the Länder level. Administrative procedural law, with its regulatory horizon, is also to be consulted when it comes to the operational implementation of administrative services in the higher education sector, especially with regard to aspects of written form and examination requirements. Finally, the question also arises as to whether HEIs are part of the e-government legislation of the Länder, especially since this is currently handled differently in the individual Länder. Universities are confronted with a complex network of legal requirements, especially at state level. This leads to uncertainty and increased caution on the part of HEIs when designing administrative processes. Up to now, there has been a lack of information for HEIs, especially on the part of the Länder, about the different legal requirements for the services to be provided digitally in accordance with the implementation of the OZG (RUSCHMEIER 2020).

Organizational framing

The Länder have generally created very different structural prerequisites for the digitization of the administration in the form of organizational units, which initially act separately from the specialized departments. The analysis in the study has shown that the German states with their specialized ministries are the main contact partners and actors for the universities, either because in the field of education/universities the sovereignty lies with the states, or because they are responsible for the establishment of state portals, to which the universities are supposed to dock. In this context, the federal government's role for the HEIs is more indirect and only project-related. In order to realize the requirements for OZG implementation in a timely manner and in accordance with the requirements, it is critical that the state department responsible for digitization or OZG implementation strives to cooperate with the respective state department responsible for HEIs in order to raise awareness and ensure that the further development of the interoperability of the state portals also takes the HEIs into account. The Kienbaum-HIS-HE study recommends actively involving the HEIs in the interest of a practice-oriented and timely solution development and building on existing IT solutions (RUSCHMEIER 2020). Currently, an increase in participation activities can be observed in the Länder - even if not yet across the board. In some cases, they are launching pilot projects to promote corresponding governance structures.

Infrastructural and IT-related framing

The professional and technological requirements for interoperability to be applied for the implementation of the OZG at HEIs were very generally defined at the time of the study, but have been concretised in the meantime through the standardisation activities in the XHochschule project. The connectivity for the concepts in the German HEIs is good, as the existing digital infrastructure offers good conditions. Almost all universities have a campus management system (CMS) for their student administration that supports the automation of administrative processes in the context of entry, exit and

examination organisation of students. In terms of data exchange between universities, pilot projects (PIM) and successful standards at the European level offer good opportunities to provide attractive solutions that universities could voluntarily adopt on a broad scale. Basically - according to the Kienbaum-HIS-HE study - universities and inter-university institutions are characterised by openness and willingness to change for digital concepts. When discussing the infrastructural requirements in HEIs in Germany, it has to be considered that in addition to CMS providers, universities are supported by other portals and cross-university IT systems with OZG relevance: Dialogue-Oriented Service Procedure (DoSV) of the Foundation for University Admission (SfH), German Research Network (DFN), Recognition and Assessment of Foreign Educational Qualifications (anabin) of the KMK as well as the association uni-assist e. V. (RUSCHMEIER 2020). Despite the good pre-conditions in the higher education sector, the following aspects need to be considered for further implementation of the OZG, which are summarised below as pitfalls or potentials.

- While entry and exit procedures of the student in the usual administrative form of the application in the CMS are already practiced consistently as online procedures, there is a lack of digital proof both on the input side of the processes, e.g. for the Abitur (A-Level) certificates, internship certificates, and on the output side, e.g.: university degree certificate, matriculation notification, proof for health insurance and pension insurance. The printed form is still necessary.
- Authentication in the application procedure is done in writing and with a personal signature. On the one hand, the written form requirement needs to be reviewed, and on the other hand, electronic authentication procedures such as those being tested or considered with the eID, the AiD and an identification number in accordance with the Register Modernization Act. (bwUni.digital 2021).
- The storage of (or access to) a nationally accessible user account is conceptually possible. However, realization is not yet being tested in relation to the higher education sector, even in pilot projects. (BLUNK 2020).
- The use of artificial intelligence methods (Hochschule für öffentliche Verwaltung und Finanzen Ludwigsburg 2018) in the above-mentioned online procedures for the recognition of certificates or the selection of students is being tested in pilot projects as a support function (e.g. PIM). (LACH/RADENBACH 2020)

3 Case studies

Both the clustering and the OZG administrative services of the "study life situation" in the OZG-LeiKa lack the usual systematics familiar to higher education law and also higher education administrative practice. They are rather constructed in a case-by-case manner. The Kienbaum-HIS-HE study found it necessary to restructure the services for the communication of the OZG in the universities and to place them in a holistic framework. The study selected services that can be assigned to the student life cycle and cover the period from the student's application for a HEI or a degree programme to the student's departure from the HEI (= graduation and/or exmatriculation). In detail, these were: Access to higher education for German applicants with and without higher education entrance qualification (1a); Access to higher education for applicants from EU countries (1b); Access to higher education for applicants from non-EU countries (2a); Assessment/recognition of certificates of foreign higher education qualifications (2b); Allocation of study places by the individual HEI (3a); Central allocation of study places by the Foundation for Higher Education Admission (3b); Matriculation (4a); Exmatriculation (4b); Recognition of periods of study and academic achievements (5a); Recognition of periods of study and academic achievements in medical studies (5b). In simplified form, Figure 1 can clarify the combination and allocation of the achievements (see numbering) in the "student life cycle".

The system mentioned was also used in the study as a basis for the requirement specifications for the service descriptions and for the selection and description of the case studies. In the meantime, the XHochschule project has also developed a so-called "university journey", which puts the LeiKa services of the "student life cycle" into university context (INIT 2020a, Appendix D).

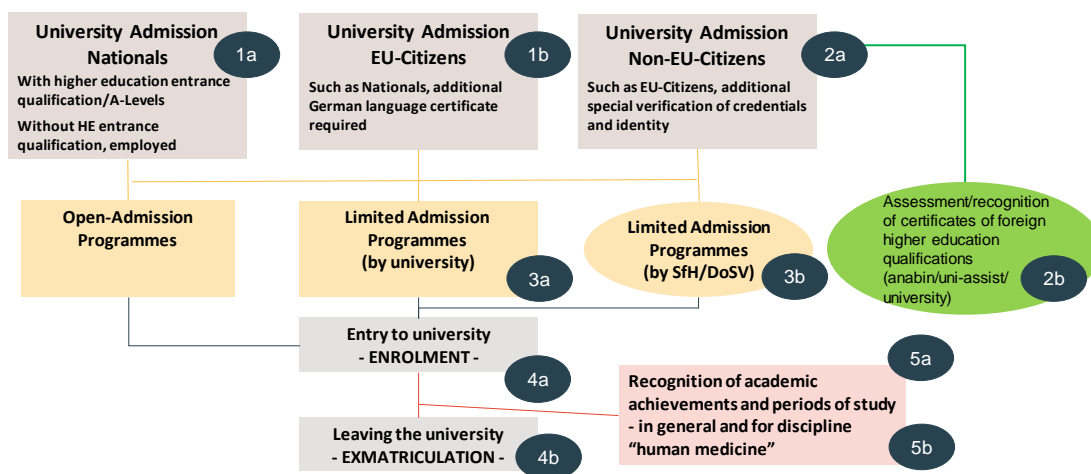


Figure 1: Overview of the selected service processes of the "study life situation"

1) Germany

University of Göttingen was selected as a German case study because it was possible to show the interplay of the various OZG services related to higher education and because U Göttingen is a pioneer in the digitization of student-related higher education processes in Germany. U Göttingen is also involved in the cross-university pilot projects PIM, XHochschule, digital certificates and digitalised data exchange between universities and health insurance companies.

At the centre of the processes is the online application and enrolment portal, which is used for enrolment. The application portal is preceded by an interactive query on the website (application check), which forwards the user to the relevant IT system. In general, the application, admission and enrolment process is usually done without the use of paper documents. Applicants must only provide proof in the form of scanned documents uploaded into the system. With the introduction of this completely digital online enrolment process, U Göttingen has dispensed with the submission and verification of originals and certified copies in paper form. According to U Göttingen, this procedure is compatible with the requirements of Lower Saxony higher education legislation. In any case, a manual authenticity check could not be carried out with ultimate consistency even for paper documents. In the case of fraud, enrolment can be withdrawn at any time. To establish their identity, students must come to U Göttingen once in person after enrolment to pick up their chip card upon presentation of their identity card. Notifications from the university to the applicants/students are provided via their accounts. They will be notified by e-mail that a download is available from the portal. The pdf-confirmation contains valid instructions on how to appeal (see RUSCHMEIER 2020 for a detailed case study).

If one compares the current state of development with a scenario based on the OZG standard, the following further developments can be forecast for the future:

- A connection to external portals is made possible if the data exchange is oriented towards the nationwide standard XHochschule. U Göttingen is involved in this.
- The application portal of the universities is networked with other university portals (Länder portals).

- The application check is expandable and contains a variety of query options about the university and the degree programmes (e.g. rankings, performance indicators of the university, profiles of known university teachers, etc.) and is optionally linked to a study orientation test.
- With the identification number entered by the applicant (e.g. tax ID according to the Register Modernization Act), his/her personal master data is automatically requested from external offices (e.g. registration data at the Residents' Registration Office) and read in. The data can be authenticated by the university after release by the applicant.
- With the introduction of a completely digital online enrolment procedure, the university does not require the applicant to submit and check originals and certified copies in paper form or as pdf documents. The necessary documents and certificates can be read in and "imported" immediately, as they are stored externally (e.g. central certificate register, central storage in a cloud) in machine-readable form and can in turn be requested and authenticated by the university after release by the applicant.
- All student data is stored in the electronic student file and can be accessed by the university or the student at any time.
- The university does not need to establish the applicant's identity in person, as the electronic authentication is unique.

2) Norway

Norway with UNIT and its governance model for cross-university digitization was used as a case study from other European countries. UNIT is a Norwegian government agency that bundles services for the higher education sector in the realisation of the current strategic goals for digital research and higher education. This includes, in particular, national coordination and overall responsibility for the departmental ministry with regard to ICT management, development and management of a common ICT architecture based on market solutions and in-house developments, and provision of services to HEIs. UNIT was significantly involved in the development of EMREX, which, based on the ELMO standard, allows the digital exchange of student data, including performance data, between HEIs, but also between HEIs and other institutions (schools, employers).

Student-related services in Norway can be handled completely digitally via a common CMS. The once-only principle is implemented for certificates. Users log into the central portal with their student ID (with eID when registering for the first time). Then they can access various services of their university and, if data exchange is required, initiate it themselves. Files are automatically read and their authenticity is digitally verified. Notifications, etc. are stored at the universities, but can be processed digitally and can be accessed by the students.

With EMREX as the data exchange format, students or graduates are given sovereignty over their data and are fully responsible for the data exchange. They can give permission to the target institutions to access their data, e.g. a digital transcript. This permission can be granted on a temporary or permanent basis. To date, EMREX is used at universities from eight countries. In Scandinavian countries (Norway, Sweden, Finland) and in the Netherlands, EMREX covers almost 100% of higher education. From UNIT's point of view, the establishment of common standards in Europe would be absolutely necessary, not only do they promote the culture of cooperation between countries and universities, but they also spread the costs of infrastructure services over many shoulders (cf. on the case study in detail: RUSCHMEIER 2020).

3) The Netherlands

The Netherlands should be mentioned here as another case study (even if only touched on). Even more than Norway, the Netherlands already offers a holistic solution with which "digital solutions are available nationwide for all HEIs and the administrative process of student mobility" (IIT 2018). This

includes not only cross-university centralised governance with the DUO (Dienst Uitvoering Onderwijs) institution and the Studielink online platform, but also the links between both and digital public administration via the DigID digital identity card.

DUO is responsible for the central registration of students on behalf of the Dutch Ministry of Education. In addition, it is responsible for the administration of Dutch student financing, the development and provision of the aforementioned platform "Studielink" and the maintenance of an online portal for diploma registers, on which school and university certificates acquired in the Netherlands can be retrieved via DigID. Last but not least, DUO was a key initiator of the Groningen Declaration on Digital Student Data of 16 April 2012, in which representatives of various countries declared their support for a worldwide exchange of digital student data. The already mentioned EMREX project can also be located in the context of the Groningen Declaration.

However, DUO is only indirectly responsible for enrolment. Prospective students in the Netherlands apply for most degree programmes directly at the universities via the "Studielink" platform. Almost all Dutch universities are involved in this procedure. The online platform guides you through the application process and provides information about missing documents. As a rule, applicants for a Bachelor's or Master's degree programme simply submit proof of the required degree and the necessary language skills (exceptions for degree programmes with restricted admission). They also provide their DigID when registering so that DUO can compare and verify the data with the Dutch population register and the "General Register for Student Numbers". After that, the application to the desired university is virtually activated (IIT 2018).

In the Netherlands, the objective of the "Once Only Principle" envisaged by the OZG has thus been largely realised for administrative procedures in the context of students' entry into higher education.

4) Estonia

Although not part of the Kienbaum-HIS-HE-study, in a comparative European perspective, reference can currently be made to a study by BHATTARAI (2019), which looks at the implementation of the SDG regulation in Estonia on the admission process of universities for students from other European countries. The focus is on the administrative process involved in the entry of a European student into an Estonian university, using existing domestic digitisation practices.

Estonia has structured and well-established digital services on a national platform. For the Estonian students, this means that the tasks that students have to complete for entry into a HEI, namely the application process, proof of accommodation (tenancy agreement) process, registration at the Residents' Registration Office, Estonian ID card and bank account are available or linked in digital form or can be created in a digital way if necessary. Once information has been requested from citizens, it can be stored and reused by public administrations. Through the use of X-Road, information is exchanged between institutions, allowing faster and easier access to information and reducing the administrative burden also from the point of view of the administration. This means that the number of official contacts is limited to a few enquiries by mail. Physical presence can be dispensed with.

The situation is different for European students coming to Estonia. The desired cross-border interoperability does not yet exist, as the EU member states do not yet have a similar data exchange platform, compatible systems and digital services, and thus the required data cannot be verified digitally. For the students, this means frequent communication with the university and/or public institutions despite online access and online assistance (e.g. registering in residents' register, applying for free transport card). On the one hand, this concerns the entire registration procedures with monetary transactions, and on the other hand, physical presences at the residents' registration office as well as the police/border guards in order to be able to process the sensitive documents on site - albeit digitally.

Estonia hopes that the implementation of the SDG in the other European countries will bring it into line with its own standard and at the same time adopt this standard for all European students who want to study temporarily or permanently in Estonia.

4 Recommendations

For the implementation of the OZG in the German higher education system, the institutional preconditions of the political multi-level system must be considered. The action potentials are distributed differently: Federal Government: OZG framework competence, project funding, communication; Länder: legal prerequisites (higher education law, administrative procedural law), funding, portals; universities/ inter-university service institutions: operational implementation of the OZG with campus management systems. Cooperation between state authorities and HEIs requires confidence-building activities to address concerns of losing university autonomy through standardisation and cross-linking. Looking to Europe can positively promote this process: on the one hand, because European legal requirements and model projects demand comprehensive implementation (EUROPEAN COMMISSION 2018), and on the other hand, because digital networks already implemented in various European countries could serve as a necessary competitive incentive for German universities.

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