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'Give and Take' – higher education teachers using open educational resources

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Open educational resource (OER) as free teaching and learning materials can contribute to the collaborative design and development of teaching. To support higher education teachers in their work with teaching in general and OER in particular and to encourage their use of OER, it is necessary to pay attention to their needs and requirements. This paper presents the results of a research project, identifying the usage behaviour of German-speaking higher education teachers. In an interview study, they were asked about their experience with OER to get detailed insights into their practices concerning their 'use' and 'revise' of materials. From this, four user types were derived according to different OER activities, such as creating, reusing, editing, and publishing OER, and their scope. Finally, these user types are transferred to considerations when designing OER infrastructures and establishing support options. These are aligned with the specifics of each user type, making the research findings a complementary contribution for application in higher education.

Keywords: open educational resources; higher education; usage; practices; reusing

Introduction

Open educational resources (OER) provide access to and allow the exchange of digital teaching and learning materials. In addition, OER also enables access to open material and gives educators the opportunity to network within a community. They can create learning materials with feedback and input from all over the world and thereby improve their teaching professionalism. Therefore, OER have great potential to make teaching and learning more efficient and more collaborative in open and distributed environments. One challenge here is to establish a culture of *Give and Take* among educators so that communities can emerge to create and edit OER. Therefore, detailed insights into teachers' practices when working with OER are necessary to further develop support structures and technical infrastructures.

This paper presents the results of a research project that explores OER usage behaviour by higher education teachers as well as their needs and requirements concerning OER. For this purpose, an interview study was conducted with OER

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experienced higher education teachers about their practical usage with OER. However, barriers that are common among non-users of OER, such as licensing, or technology acceptance, are not considered in this study. After presenting theoretical concepts and usage studies that resulted in the methodological approach, basic results are described. From this, four user types according to different OER activities and their scope were derived. Finally, these findings are discussed in the current discourse and the user types are transferred to considerations when developing and establishing support.

Background

Concepts of OER usage

The idea of OER can be presented in the context of open education (Zawacki-Richter *et al*. 2020) and can be seen as part of the concept of open educational practices (OEP), which describes the creation and use of OER related to the application of open teaching methods and collaborative practices (Cronin 2017; Ehlers 2011). In addition, learners can benefit from open practices by developing open materials and shaping their learning process. According to Wiley and Hilton (2018), this *OER-enabled pedagogy* is made possible by the 5Rs.

The concept of 5Rs according to Wiley (2014) illustrates the possibilities of open licenses when dealing with educational materials. The access to materials and the permission to own materials as a personal copy (*retain*) are the prerequisites for the further rights to use, edit and share OER. Thus, materials with open licenses can be reused by using and integrating them into one's own materials (*reuse*), edited by making changes and adaptations (*revise*), mixed by combining different contents (*remix*), and shared publicly (*redistribute*). These usage rights can be reflected in different OER lifecycles (Beaven 2018; Fulantelli *et al*. 2008; Pawlowski 2012) to illustrate how practitioners create learning and teaching materials. These lifecycles have in common that they include the elements *search, design, use, edit* and *share* which reflect the phases of working with OER.

These approaches systemize the usage possibilities and behaviour regarding OER so that these are summarized for the theoretical classification of the research interest of this study. Based on the elements of OER lifecycles and the 5Rs, four activities as central part of the OER concept (Gurell and Wiley 2008) can be mapped in the practical usage of OER in the context of *creating*, *reusing*, *editing* and *publishing* open materials (see Table 1). In the production of OER, external open content can be used (reuse) and, if necessary, inserted into own materials with modifications and adaptations (edit). In distinction to the integration of external

Table 1. OER activities related to OER cycle and 5Rs.

OER activity	OER cycle	5R
Create	Design	
Reuse	Use	Reuse
Edit	Edit	Revise, Remix
Publish	Share	Redistribute

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OER, own materials can also serve as a basis for the development of OER (create). Finally, compiled OER are publicly shared and disseminated under an open license (publish).

Usage studies of OER

The application of each element of the 5Rs and the OER cycle has been explored in various studies in higher education contexts presented below. Educators seem to engage in various OER activities in their practice by searching, merging, modifying and using OER (Beaven 2018). Integrating external OER into one's own materials occurs with and without modifications (Rodés *et al*. 2019). External materials are adapted for individual contexts, usually by adapting or changing their content (Cardoso, Morgado, and Teixeira 2019). Different practices could be observed for different types of materials. While videos and images are reused without modifications, instructors often make adaptations for course units. Presentations and assignments are material types that are predominantly self-created and not reused by others (Baas and Schuwer 2020).

By reusing OER, instructors aim to improve the quality of their teaching, but they want to avoid too much effort for adaptations and remixing (Baas, Admiraal, and van den Berg 2019). It is an open question how and to what extent remix activities are applied (Wiley, Bliss, and McEwen 2014). It could be found that teachers rarely publish OER in repositories, but instead share their materials with students and colleagues in informal settings (Beaven 2018). This provided evidence of *dark reuse* (Wiley 2009), as use and dissemination take place outside of repositories (Baas, Admiraal, and van den Berg 2019; Beaven 2018). Moreover, materials are often shared without open licenses (Baas, Admiraal, and van den Berg 2019; Schuwer and Janssen 2018).

Five usage types were derived from different usage patterns of educators based on survey data from the OER Research Hub (Admiraal 2022; Open University 2015). The characteristics of the usage types are based on activities of instructors related to the creation, use, adaptation, publication, and commenting on resources in distinction of material types as well as the purpose of use. Almost half of the participants could be assigned to Type 1 (49%), which is characterized by a high value of reuse and editing of OER for various purposes, while own materials are not shared. The other types are distributed in comparable proportions. Type 2 (12%) has the highest value in commenting on resources in a repository, in addition to adapting OER. While Type 3 (12%) creates, edits and publishes OER, Type 4 (11%) participants have a high value in all usage characteristics (creating, editing, publishing and commenting). Type 5 (16%) excels in consuming OER by scoring low on all characteristics. Thus, adapting OER was found to be the largest proportion, while creating and publishing their own OER were lowest.

Quantitative usage studies provide basic information about low usage of OER (Baas, Admiraal, and van den Berg 2019; Schuwer and Janssen 2018) by teachers and observations determined use and sharing as non-visible (Beaven 2018). However, detailed insights into practices and behaviours of teachers in using and revising OER and their needs are lacking (Heck *et al*. 2020). These insights from qualitative studies are necessary to support instructors in using OER in their teaching practices. Therefore, this paper presents the results of a qualitative research project that identifies

usage patterns of OER by higher education teachers in order to facilitate the design of support measures specifically for different user types on this basis.

Method

Since previous studies were mostly able to determine rather general information quantitatively (Heck *et al*. 2020), in light of the research needs and the depth of OER activities presented above, this study aims to identify actual practices of higher education teachers in dealing with OER. The qualitative approach was chosen in order to gain these deeper insights into the actual work with OER, which is often not possible with quantitative research approaches due to operationalization processes (Kelle 2006). The data were collected through semi-structured interviews as those allow to gather both specific pieces of information in a comparable format and leave room for details on individual user experience (Galletta 2013). Based on the overall research question *'How do higher education teachers use OER?'*, the following sub-research questions were formulated:

- What types of OER-material do teachers create, use, edit and publish?
- How do teachers create, use, edit and share OER in their educational practice?
- What needs and requirements do teachers have when dealing with OER?
- Can certain types of use be identified?

The interviews ($N = 18$) were conducted with German-speaking university lecturers (8 female; 10 male) from Germany and Austria in video interviews (30–60 min) between July and September 2020. Since the focus of this study is on the practices of higher education teachers with OER as well as their explicit and implicit knowledge about the use of OER, the interviews were conducted with teachers with OER experience only. Participants were identified from existing networks of OER research projects and internet searches for active individuals. Based on this, personal recommendations from colleagues were included. This had the advantage that further participants could be selected who, due to their background, could contribute to the broadest possible overall picture. 22 potential participants were contacted directly by e-mail, resulting in 18 interview confirmations. Prerequisites for the final participation in the interviews were:

- teaching at a German-speaking university
- creating open materials for teaching
- at least one further OER activity (reuse, edit, publish OER)

Accordingly, the interviewees were all active in university teaching (eight doctoral students, six postdocs, four professors) and have practical knowledge regarding OER. To adequately represent the diversity of active OER users some of the interviewees first encountered with creating OER within the framework of projects, while other teachers have been continuously practicing OER for several years. However, differences in the extent of experience were not recorded, so no conclusions can be drawn in this regard in the analysis. In terms of subject, six teachers can be assigned to the natural sciences and 11 participants to the humanities and social sciences.

To structure the interviews according to the research questions, a semi-structured interview guide with four main content areas was developed (Roulston and Choi 2018). As an introductory narrative stimulus, the teachers were asked to present one

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of their own OER. The other topics – *design, development* and *implementation/evaluation* – were based on the presented theoretical background on OER and supplemented with more specific questions.

The collected data were partially transcribed using interview-accompanying documentation, that is, only segments related to the specific research topic were transcribed and considered for the analysis. The corresponding interview segments were coded and categorized using the MAXQDA analysis software according to the content structuring qualitative method of Kuckartz (2018), which in contrast to other qualitative approaches, such as the Grounded Theory Methodology (e.g. Corbin and Strauss 2015), allows a rather structured analysis of the collected interview data. For the category formation, main categories oriented to the underlying research questions were first formed deductively for content framing and focusing. These are, based on the framework of the interviewees, different types of material, their practices, and needs and requirements. The first sub-category was formed on the basis of the topics from the interview guide (see Table 2). To specify the characteristics, various further subcategories were formulated inductively (Kennedy and Thornberg 2018).

Instead of following up with a type-forming qualitative content analysis, approaches to type formation were made based on the identified content-structured categories that refer specifically to the usage behaviour of individuals, using the document map in MAXQDA. The typing was done exclusively with first and second order subcategories that explicitly refer to experiences and practices working with OER. This approach allows a focused look at the different types of users without including too many environmental factors. The individual subcategories were then assigned to the characterising OER activities (see Table 3).

Table 2. Coding scheme.

Main category	First order subcategory
General conditions	OER experience
	OER motivation
	Example materials
	Origin of materials
Material types	Creating
	Reusing
	Editing
	Publishing
Creating and reusing	Collaboration
	Scope of reusing
	Remix
	Changes
Editing after use in teaching	Feedback
	Types of changes after use
	Further materials
Sharing	Internal
	Public
Needs, requirements	Difficulties
	Suggestions
	Version management

Table 3. Relevant subcategories for creating user types linked to OER activities.

OER activity	Main category	First + second order subcategory
Create	Material types	Creating
	General conditions	Origin of materials: Own materials
Reuse	Material types	Reusing
	General conditions	Origin of materials: External OER
Edit	Material types	Editing
	Creating and Reusing	Remix: OER
Publish	Material types	Publishing
	Sharing	Public

Results

The evaluation of the qualitative study has resulted in findings about the use of OER in university teaching. After presenting the main results with accompanying quotes from the participants, derived user types of higher education teachers dealing with OER are presented. The teachers' sample OER provided the framework for the details and background on their open activities and practices.

For seven participants, large-scale materials (e.g. courses, videos) were supported by projects aimed at publication as OER. Four projects on providing OER were self-initiated and occurred on a one-time basis. However, all materials have been used in their university's own teaching. The conception of these OER was either directly openly accessible or corresponding OER was published based on closed courses.

Material types

The first research sub-question aimed to find out what types of materials teachers create, use, edit and publish. The evaluation was then evaluated based on these OER activities (see Figure 1).

Presentations, tasks, H5P elements and didactic concepts are mostly created as open materials. In contrast to this, these material types are not published individualy, but integrated into entire courses. Similar observations can be made for other large-scale resources with high production effort, such as videos, textbooks, or an interactive app. Even though published OER usually have a larger scope, teachers tend to use independent, smaller types of material for their teaching, for example, images.

Due to easy search options and simple possibilities for integration, images and graphics are the most frequently reused type of material. Images are usually adapted by minor changes, for example, cut or color adjusted, before embedding in own materials. Graphics without open licenses are often reworked or repurposed to avoid legal consequences. The reuse of videos is mostly done by linking to external platforms. Edits of videos take place, for example, by integrating H5P elements with interactive exercises. Worksheets comprise all OER activities by creating own working materials, reusing external ones, individually adapting, and combining them by remix and finally making them publicly available.

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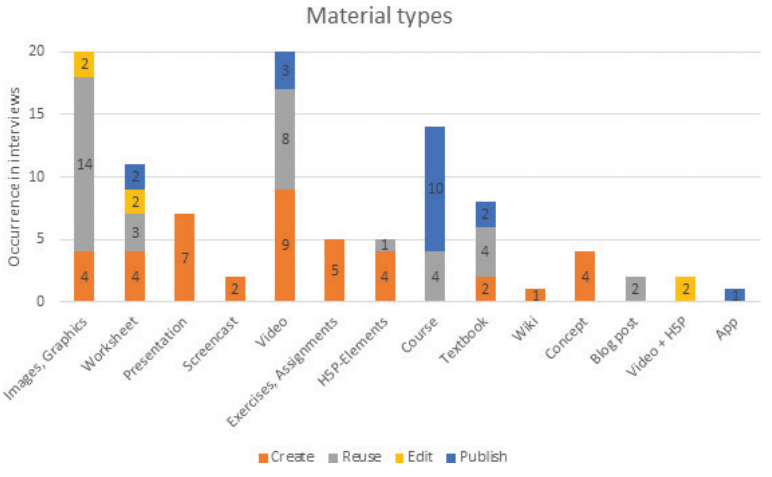

Figure 1. Material types by OER activities.

Practices

The second research sub-question 'How do teachers create, use, edit and share OER in their educational practice?' was intended to provide a more detailed look into the practices of the teachers. Here it was found that as a material base for creating OER, almost half of the participants (8) rely on their own materials and only occasionally (8) or not at all (2) on external OER. Poor findability and availability in the subject areas, lack of open licenses or high adaptation effort are mentioned as hurdles for the use of OER ('If material doesn't fit 100% and it's too much that I would have to change, […] then I rather do it myself'. Participant 13; *Translation by the authors*). However, available resources are an important source for impulses because 'it's also living from getting inspired' (Participant 14).

Eight participants integrate external OER from different types of materials as well as individual elements of a resource into their own content. Using materials without any changes happens rather rarely, because usually adaptations to contexts and to the respective target group are necessary. To integrate external content into one's own concept, not only the content but also the scope, structure, arrangement, or design need to be customized.

Combining different materials into a new resource is a typical scenario for the creation and reuse of external content, to 'put things together like a construction kit' (Participant 01), because 'it is also about mixing things up, for example, putting things into a different context again and comparing them […]' (Participant 14). One challenge when remixing OER is finding materials that are available with open licenses because only those can be reused. Five participants stated that they actively use OER remixing in their daily practice. For these users, 'Remix [is] a central element of OER. Swarm intelligence can be used in the process' (Participant 06). Instead of using entire courses ('It would be great coincidence if I found exactly one course that fits'. Participant 02) some (5) prefer to adopt individual course elements with the addition of their own content and target group-specific adaptation. In some cases, videos and courses are applied as complete materials by linking to them as self-study materials.

The interviewees usually share materials both in a closed space with students (18) and partly with colleagues (11) within their own institution or the professional community as well as publicly. Although materials on a smaller scale are preferably reused, they are rarely published.

With regard to reusing and editing materials, it emerged during the interviews that transparency of changes and improvements as well as feedback and exchange within a community are of particular importance. The resources presented by the interviewees were created either alone (6), with colleagues from their own institution (6) or across institutions in project teams (6). In some cases, correction loops were integrated for collaborative revision of the content. According to the interviewees, intra-departmental exchange among colleagues and inter-institutional exchange are only common in a few cases. It can be stated that 'this community idea […] has not yet been established' (Participant 02). Feedback and suggestions for possible changes are considered valuable by all participants. 'Every material […] is somehow in need of improvement' (Participant 01) and 'it […] [gains] quality when you have the view from the outside again' (Participant 03). An OER-experienced and -active participant who has already received feedback via a personal blog and Twitter emphasizes, 'What I really appreciate about OER is that you get peer feedback and can really improve' (Participant 16). Peer feedback is thus appreciated, however, some participants 'have not yet found an active community to contribute' (Participant 07). Often there is not enough time for regular necessary updates, especially with project-based materials. This is where an active community can provide useful support ('At best, others develop it further so that it doesn't necessarily have to be done by the person who created the material'. Participant 18).

Needs and requirements

Expectations and needs of the users could be identified, especially regarding the technical infrastructures. Low-threshold access to standardized and user-friendly OER tools appears to be central. According to the interviewees, platforms for searching OER and publishing different types of material could be expanded. The subdivision of extensive materials into individual units, for example, images from a presentation, could promote reuse. Functions for creating of materials collaboratively and interactive exchange options are also desirable.

To make further developments of content visible, teachers expect a possibility to provide new versions. For half of the participants, it is relevant that they can access older versions and track changes between version. ('I also wanted to show what didn't work so well and where there is still potential for improvement'. Participant 13). However, the freedom of the individual authors must be considered. One participant summarizes: 'I would like to be able to decide, this can stay, this is still relevant […] or I can say I don't want this to be found anymore either, it's so outdated now' (Participant 04).

The desire for feedback and exchange as well as an interest in learning about external reuses of their own materials can be identified. The interviewees themselves provided feedback on OER, which they reused and edited, only in a few cases. Accordingly, there is a lack of an easy way to contact creators and functions for commenting to realise voluntary feedback in the OER-sense of 'give and take' (Participant 04).

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User types

The final research focus addressed the question of whether different types of users can be identified among teachers. Based on the results presented, the individual interviewees can be assigned to identified OER activities: create, reuse, edit and publish (see Table 1). For that, coded elements identified in the course of the qualitative content analysis (see chapter *Method*) that can be considered relevant to OER activities were selected. This involves the origin of the used content, differentiated by own materials as a characteristic for 'create' and external open materials as a characteristic for 'reuse'. Editing of different types of materials and the use of remix in OER serve as a reference point for the activity 'edit'. 'Publish' refers to public provision on the one hand, and to the types of materials shared on the other (see Table 3). Based on these enabled codes, a document map was created (see Figure 2), with interviewees clustered according to the Raediker and Kuckartz (2019) similarity measure, which weights the presence of codes double and the absence of codes single. After plotting the participants in a distance matrix, four groups matched in terms of OER activities. Whereupon four types of use emerged in the practical handling and use of OER (see Table 4). The identification of the types of OER users here primarily serves as a simple illustration of typical patterns of use (Kuckartz 2018), so that clues can be drawn to promote the application of OER in higher education. Since these are exclusively participants with OER experience, the user types do not include users who do not work with OER. Instead, all user types create OER so that this activity is fulfilled for all of them. The user types differ in the extent and frequency of use of the other activities. This could be determined on the basis of the individual coded elements (see Table 3).

Type A (see Table 4) is the largest group, with ten interviewees, who based their developed materials mainly on their own materials. The creation of the materials was

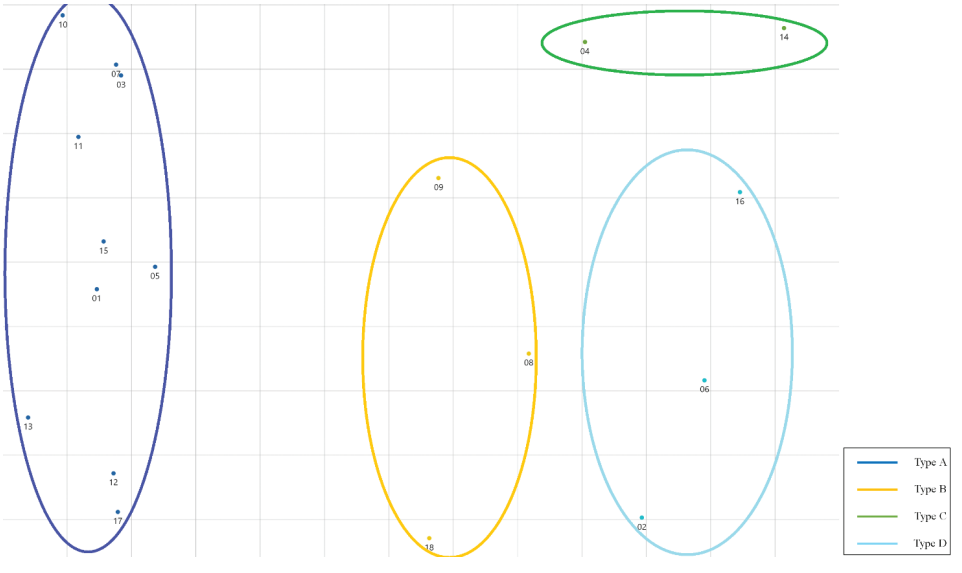

Figure 2. Document map from MAXQDA showing the similarities of the participants.

Table 4. User types based on OER activities.

User type	Number	Participants	Typical OER activity
A	10	01, 03, 05, 07, 10, 11, 12, 13, 15, 17	Create, Publish
B	3	08, 09, 18	Create, Reuse, Publish
C	2	04, 14	Create, Reuse, Edit
D	3	02, 06, 16	Create, Reuse, Edit, Publish

either done openly from the start or was later adapted or transformed to allow public sharing. Legal difficulties were either avoided in advance by making little reuse of external resources or by refraining from using materials without open licenses. One characteristic of this type is that the publication of materials as OER was predominantly once-only and sometimes supported as part of projects.

Type B develops its content both through own materials and through the reuse and integration of external OER, although this is predominantly done without special editing. The finished resources are also mostly published. Three participants could be assigned to this type.

Type C users create materials with open licenses and, in addition to their own materials, also reuse and partially edit a high number of external OER, but do not make them publicly available. Two interviewees practice these OER activities.

Type D includes all four OER activities and is practiced by three OER users. In addition to the creation, reuse and publication, external materials are also frequently edited and redesigned.

Discussion

The results of the interview study supplement the current discussion about the use of OER among higher education teachers with OER experience. Usage studies from current literature that include participants without an OER background have found that use and adaptation of OER among teachers are low (Baas, Admiraal, and van den Berg 2019; Schuwer and Janssen 2018), and sharing does not take place publicly, so that reuse is not visible (Beaven 2018). The present study shows that the participating higher education teachers prefer to build their materials on their own materials instead of reusing external OER. Results on dealing with different types of materials are also comparable. It was found that presentations and assignments are predominantly self-created and videos and images are often reused without modifications. Beyond that, however, adaptations are made for use in individual contexts. Editing in the sense of redesigning and remixing is rarely investigated in the literature. This study has determined that this occurs only among a few instructors who have fully aligned their teaching with open materials and practices and thus use all OER activities. Teachers who created and published OER as part of one-time projects were also observed to share materials with colleagues in regular teaching contexts. Teachers also reported that students elaborated content independently using external OER and created their own OER. Thus, with the help of OER, open teaching methods were supported in terms of OEP.

Compared to Admiraal (2022), the identified user types and their OER activities were examined in more detail due to the qualitative approach. For this, a high

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number of participants could not be considered to support the distribution of the types whereas Admiraal (2022) built on a large data basis. In addition, differences in the underlying activities are present in both approaches. In contrast to the types according to Admiraal (2022), commenting on OER was not considered in the type formation of this study, so Type 2 and Type 4 are not comparable. Similarly, Type 5, which exclusively consumes OER, does not find a counterpart in the presented user types, since the creation of OER was defined as a prerequisite for participation. Type 1, the largest group with 50%, records the highest values for reuse and adaptation. This is not reflected in the presented OER user types, especially since here, instead of minor individual adaptations, edits in the form of redesign and remixing were included in the evaluation. Type 3 is to be compared with Type D, as all OER activities are represented by a similar number of people (Type 1: 12%, Type D: 16.67%).

The distribution among the identified user types of this study is primarily due to the selection of interviewees. To investigate open practices of teachers, the prerequisite was the involvement in the creation of an open resource. While recruiting participants, a first clue was to identify creators of published OER which often had been created and promoted as part of projects. This is also reflected in the practices of Type A (55.55%). This user type, on the one hand, mainly uses its own materials served as a basis in the creation and, on the other hand, often uses non-open materials in their regular teaching. In contrast, there was a difficulty in identifying participants who reuse external OER in their teaching but do not make their own materials publicly available. Therefore, it can be assumed that Type C in fact applies to a larger number of instructors who use OER with external openly licensed materials, but do not make them public. Type B and Type D, which differ in whether external OER are processed, can be classified as experienced and active OER users. The low percentage in Type D, which practices all OER activities, shows that editing of external OER is limited.

Overall, the identified OER user types contribute to an overview of different OER activities that should be considered differently in technical infrastructures and support offerings. In each case, the distribution of the user types must be determined individually in institutions to develop coordinated offers. The active involvement of different types can ensure the creation of sustainable and demand-oriented offerings. Type A, for example, requires the availability of external materials with open licenses and professional quality. Since teachers prefer to reuse materials with a smaller scope and integrate individual elements into their content, it should be possible to divide extensive materials into individual thematic units or formats. The reuse of materials can be further increased by building communities with opportunities for exchange and feedback options. Type B can also benefit from this function to find cooperation partners for the processing of materials. Type C needs support in publishing resources so that advice on legal issues, licensing, and publishing venues are beneficial for them. Since Type A usually only publishes individual resources on an irregular basis, this support can also be valuable for this user group to achieve a continuation of OER in teaching. In addition, guidance on open file formats and tools could help increase the editing of external materials. Type D corresponds to the ideal idea of OER users. Therefore, the aim is to increase this proportion among teachers by promoting their visibility and active participation in OER communities so that they can serve as an orientation for other teachers. For example, Type D teachers could act in a multiplier function to promote the culture of 'Give and Take' among Type A, B and C individuals.

Conclusion

Focus of this study was on the usage behaviour and application of open practices by higher education teachers who have already had experiences with OER in their teaching. The identified expectations, concerns and requirements of the teaching staff, must be taken into account by the responsible actors when designing support measures. The derived user types therefore serve as an orientation for supporting OER in higher education. Initial options have been identified that need to be individually expanded and shaped. It should be noted that due to the selection of interviewees, only a limited impression of open practices and usage behaviours could be considered. Apart from the interviewed OER users, there are of course other users with further expectations and requirements. Furthermore, the limitation to German-speaking higher education teachers must be taken into account. Copyright regulations in German-speaking countries may have an influence on these specific results, for example with regard to the use of external materials. Nevertheless, the presented interview study as well as the main results can be used as a starting point for research in other countries or educational areas. Therefore, the results should be taken into consideration when designing infrastructures and fostering support structures for OER.

It was found that some participants, in addition to OER activities in the context of projects, do not use OER practices in their regular teaching. Nevertheless, the findings cannot be projected on teachers who do not use open practices at all. For further research, it is therefore necessary to also interview higher education teachers with no OER experience, to evaluate their reasons for barriers, for example, possible fears. As an addition to the user types presented here, this could create the possibility of creating a more general and in-depth concept for the implementation of a sustainable OER strategy.

Overall, the overarching goal of increasing and promoting the use of OER in higher education as well as making it more widespread is still to be pursued to achieve a cultural change. This can be seen as a prerequisite for developing subject-specific and interdisciplinary communities that exchange information on materials. Thus, teachers can benefit from the quality improvement of their materials and possible applications for their teaching. Through the exchange of didactic concepts, more extensive open teaching practices can be promoted beyond individual materials. In addition, learners can be more involved in the design and development of materials and be motivated to create, share and use them independently. The appropriate design and features of technical infrastructures can also support this and should be taken into account by developers of repositories and platforms.

References

Admiraal, W. (2022) 'A typology of educators using open educational resources for teaching', *International Journal on Studies in Education*, vol. 4, no. 1, pp. 1–23. doi: 10.46328/ijonse.60

Baas, M., Admiraal, W. & van den Berg, E. (2019) 'Teachers' adoption of open educational resources in higher education', *Journal of Interactive Media in Education*, vol. 2019, no. 1, Art. 9. doi: 10.5334/jime.510

Baas, M. & Schuwer, R. (2020) 'What about reuse? A study on the use of open educational resources in dutch higher education', *Open Praxis*, vol. 12, no. 4, pp. 527–540. doi: 10.5944/openpraxis.12.4.1139

Beaven, T. (2018) '"Dark reuse": an empirical study of teachers' OER engagement', *Open Praxis,* vol. 10, no. 4, pp. 377–391. doi: 10.5944/openpraxis.10.4.889

Citation: Research in Learning Technology 2023, **31**: 2916 - http://dx.doi.org/10.25304/rlt.v31.2916

Cardoso, P., Morgado, L. & Teixeira, A. (2019) 'Open practices in public higher education in Portugal: faculty perspectives', *Open Praxis,* vol. 11, no. 1, pp. 55–70. doi: 10.5944/openpraxis.11.1.823

Corbin, J. & Strauss, A. (2015) *Basics of Qualitative Research. Techniques and Procedures For Developing Grounded Theory*, 4th edn, Sage, Thousand Oaks, CA.

Cronin, C. (2017) 'Openness and praxis: exploring the use of open educational practices in higher education', *The International Review of Research in Open and Distributed Learning,* vol. 18, no. 5, pp. 1–21. doi: 10.19173/irrodl.v18i5.3096

Ehlers, U.-D. (2011) 'From open educational resources to open educational practices', *ELearning Papers,* no. 23, [online] Available at: https://www.oerknowledgecloud.org/archive/media25161.pdf

Fulantelli, G. *et al*., (2008) 'The open learning object model to promote open educational resources', *Journal of Interactive Media in Education*, vol. 2019, no. 1, Art. 9. doi: 10.5334/2008-9

Galletta, A. (2013) *Mastering the Semi-Structured Interview And Beyond: From Research Design to Analysis and Publication*. New York University Press, New York. doi: 10.18574/nyu/9780814732939.001.0001

Gurell, S., & Wiley, D. (2008) *OER Handbook for Educators*, [online] Available at: http://wikieducator.org/OER_Handbook/educator_version_one

Heck, T., Kullmann, S., Hiebl, J., Schroeder, N., Otto, D. & Sander, P. (2020), *Designing open informational ecosystems on the concept of open educational resources*', Open Education Studies, vol. 2, no. 1, pp. 252–264. doi: 10.1515/edu-2020-0130

Kelle, U. (2006) 'Combining qualitative and quantitative methods in research practice: purposes and advantages', *Qualitative Research in Psychology*, vol. 3, pp. 293–311.

Kennedy, B. L. & Thornberg, R. (2018) 'Deduction, induction, and abduction', in *The SAGE Handbook of Qualitative Data Collection,* ed U. Flick, Sage, London, pp. 49–64. doi: 10.4135/9781526416070.n4

Kuckartz, U. (2018) *Qualitative Inhaltsanalyse, Methoden, Praxis, Computerunterstützung*, 5th edn, Beltz Juventa, Weinheim.

Open University (2015) 'OERRH survey data 2013–2014', *figshare*. doi: 10.6084/m9.figshare.1317313.v1

Pawlowski, J. M. (2012) 'Emotional ownership as the key to OER adoption: from sharing products and resources to sharing ideas and commitment across borders', *EFQUEL Innovation Forum 2012*, [online] Available at: https://pressbooks.bccampus.ca/facultyoertoolkit/wp-content/uploads/sites/114/2017/02/OER_emotional_ownership_pawlowski20120529citation.pdf

Raediker, S. & Kuckartz, U. (2019) *Analyse Qualitativer Daten mit MAXQDA*, Springer, Wiesbaden. doi: 10.1007/978-3-658-22095-2

Rodés, V., Gewerc-Barujel, A., & Llamas-Nistal, M. (2019). `*University Teachers and Open Educational Resources: Case Studies from Latin America*', The International Review of Research in Open and Distributed Learning, vol. 20, no. 1, pp. 165–183. doi: 10.19173/irrodl.v20i1.3853

Roulston, K. & Choi, M. (2018) 'Qualitative interviews', in *The SAGE Handbook of Qualitative Data Collection,* ed U. Flick, Sage, London pp. 233–249. doi: 10.4135/9781526416070.n15

Schuwer, R. & Janssen, B. (2018) 'Adoption of sharing and reuse of open resources by educators in higher education institutions in the Netherlands: a qualitative research of practices, motives, and conditions', *The International Review of Research in Open and Distributed Learning,* vol. 19, no. 3, pp. 151–170. doi: 10.19173/irrodl.v19i3.3390

Wiley, D. (2009, June 10) 'Dark matter, dark reuse, and the irrational zeal of a believer', *Iterating Toward Openness,* [online] Available at: http://opencontent.org/blog/archives/905

Wiley, D. (2014, March 5) 'The access compromise and the 5th R', in *Iterating Toward Openness,* [online] Available at: http://opencontent.org/blog/archives/3221

Wiley, D., Bliss, T. J. & McEwen, M. (2014) 'Open educational resources: a review of the literature', in *Handbook of Research on Educational Communications and Technology*, eds J. M. Spector *et al*., Springer, New York, pp. 781–789. doi: 10.1007/978-1-4614-3185-5_63

Wiley, D., & Hilton III, J. L. (2018) 'Defining OER-enabled pedagogy', *The International Review of Research in Open and Distributed Learning,* vol. 19, no. 4, pp. 133–147. doi: 10.19173/irrodl.v19i4.3601

Zawacki-Richter, O. *et al*., (2020) 'Elements of open education: an invitation to future research', *The International Review of Research in Open and Distributed Learning,* vol. 21, no. 3, pp. 319–334. doi: 10.19173/irrodl.v21i3.4659

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