Open to all, not known to all: sustaining practices with open educational resources in higher education
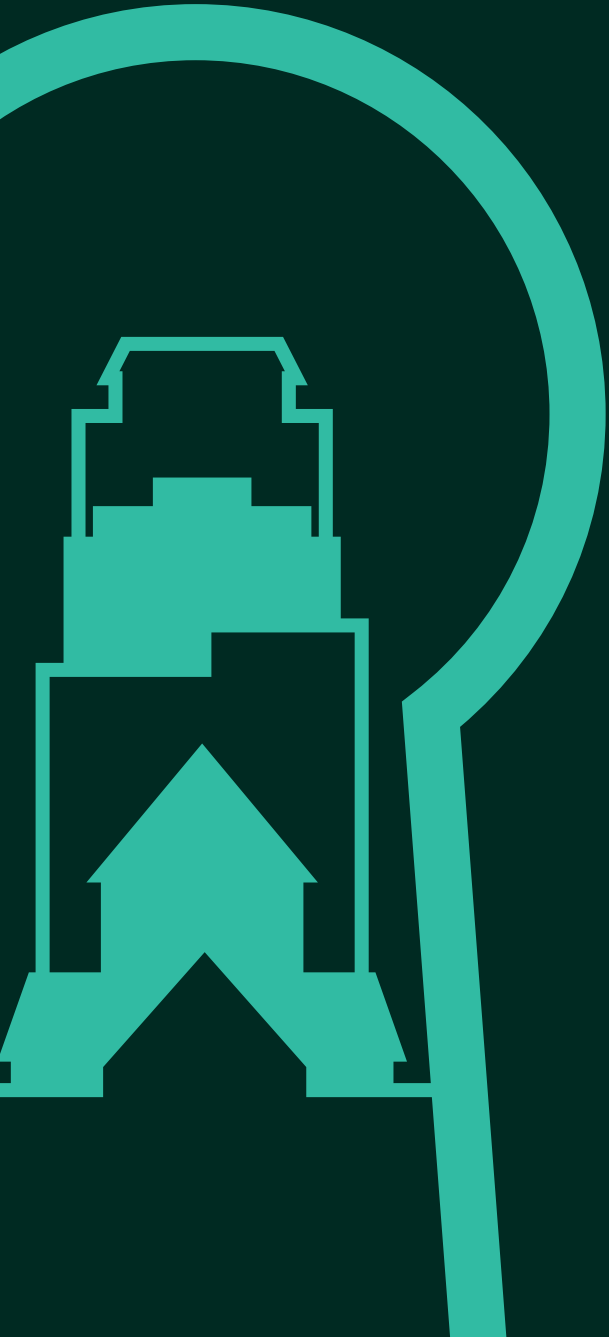
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Citation

Baas, M. A. A. (2023, October 5). *Open to all, not known to all: sustaining practices with open educational resources in higher education. ICLON PhD Dissertation Series*. Retrieved from https://hdl.handle.net/1887/3643088

SUMMARY

Higher education curricula are regularly transformed to stay abreast of the diverse societal, technological, and domain-specific developments. Teachers continuously design, update or revise their curricula to prepare students for this rapidly changing world. To aid students' learning, teachers use a wide range of resources.

Nowadays, many educational resources are available online with open licenses that indicate how they may be reused. These resources are shared by people around the globe and are better known as open educational resources (OER). OER are learning, teaching, and research materials in any format and medium that reside in the public domain or still hold copyright but have been released under an open license that indicates that no-cost access, re-use, re-purpose, adaptation and redistribution by others is allowed. Surely, the difference between a traditional resource and an open educational resource are the OER defining '5R' characteristics: users may reuse, retain, revise, remix, and redistribute the resource. Everyone has the permission to engage in the following '5R' activities:

- Reuse: the content can be reused in its unaltered original format and may be used in a wide range of ways. For example, a teacher may use the resource in their class, in the virtual learning environment, in a video, online, or anywhere else.
- Retain: the content can be retained for personal archives or references. For example, a teacher has the right to download, store, manage, and own copies of the resource.
- Revise: the content may be modified, adapted, adjusted, or altered to align it with the user's specific needs. For example, a teacher may translate the content into another language, only use parts of the resource, or adapt it to their specific context.
- Remix: the content, either the original content or revised content, may be adapted with other content to create something new. For example, a teacher combines their own resources with an OER to create a new resource.
- Redistribute: the content, either in its original format or altered format, may be shared with anyone else. For example, a teacher can freely share copies of the resource with colleagues and students.

In **Chapter 1** we further explicated and position the concept of OER within the wider open education movement that aims to move from knowledge as a commodity to knowledge as a commons. For example, most likely every scientist is familiar with concepts like open access, open data, and open science, and every programmer is probably versed in open source software. Concepts like open educational resources, massive open online courses, and open educational practices can all be understood as open education. Open education is not intended to be a substitute for traditional higher education, but it aims to provide learners free access to resources throughout their lifelong learning.

Indeed, for students one primary advantage of OER relate to having free access to resources. This is pivotal to expand access to higher education. Another advantage is that OER can increase the variety of the resources students use to support their learning process. Different pedagogies, different modalities, or just seeing other examples are reasons why students often look for additional resources. For teachers, a key advantage of OER is that they can reuse OERs rather than start from scratch when designing or revising curricula. It allows teachers to customize resources to align them with their specific context. For example, a teacher can decide to use only parts of a resource (e.g. only use one chapter of a textbook), to revise a resource to better illustrate their specific context (e.g. to add content or include diversity), or to mix OERs with other resources to enhance the course content for students (e.g. to provide differentiation).

Nowadays, over two billion resources are available online that are shared with a Creative Commons license, the most often used license to share resources openly. Teachers can, for example, search with filters for OER within well-known repositories like YouTube, Flickr, or Vimeo, but they can also search within OER specific repositories like MERLOT, OASIS, OERCommons or in the Dutch repositories Wikiwijs and edusources. As a result, there is a vast number of OER available for teachers comprising a wide range of types of resources. Generally, OER can be divided in two categories: 'big' and 'little' OERs (Weller, 2010). Big OERs are created by institutes, are often of high quality and are designed with explicit teaching aims. Examples hereof are Open Textbooks, OpenCourseWare, and Open Online Courses. Little OERs are individually created, may not have explicit educational aims, and are made at lower costs, often resulting in low production quality. Little OER can consist of all kinds of smaller resources such as presentations, assignments, assessments, pictures or videos.

Yet, despite the opportunities OER can have to contribute to high quality and accessible education, reuse appears to remain low in higher education. Numerous initiatives to share have been initiated across the globe, but many tamp out after the project funding ends. Sustainable practices with OER are still constrained and it is therefore crucial that we increase our understanding of how we can move from a few single teachers' enthusiasm to a sustainable practice in which resources are continuously shared, reused, and updated. Nevertheless, limited empirical research has been undertaken to investigate how structural adoption of OER in higher education can be enhanced. Hence, this dissertation aimed to examine the challenges of OER adoption in higher education so that we could contribute insights into the sustainability issues many OER initiatives encounter. Four studies were designed to gain insights into (1) teachers' current practices with OER and their need for support to foster OER adoption, (2) teachers' assessments of OERs on quality, (3) the role of brokers in cultivating an inter-institutional community on OER, and (4) teachers' perceived value of that community.

In the study described in **Chapter 2**, our objective was to gain insights into teachers' current practices with OER and their need for support to foster adoption of OER. We used a mixed-methods design in this exploratory study, collecting data through a questionnaire and semi-structured interviews. The questionnaire aimed to examine the current state of affairs, and we received 143 fully completed questionnaires. To explore teachers' current practices in more detail and gain insights into their need for support, we conducted interviews with a purposeful sample of 11 teachers. The OER adoption pyramid (Cox & Trotter, 2017), which emphasizes the interdependencies of factors that impede OER adoption, was used as the theoretical framework.

The analysis of the questionnaire and interview data implied that some teachers use OER in their teaching, but only minimally. It is important to stress though that this finding could be influenced by what is known as 'dark reuse' (Wiley, 2009). Teachers may unconsciously engage with OERs by using resources from other sources such as colleagues or previous courseware, without realizing these are OERs. Sharing resources, however, happens often, although mainly without an open license as teachers primarily share on a local level within their team or school. In general it could be stated that awareness of the concept of OER is limited.

Teachers' need for support to foster OER adoption was derived from the analysis of the interviews. We discerned several facilitating support mechanisms which we grouped in three overarching themes: availability, capacity, and institutional support. The first theme, availability of OER, related to teachers' need for support to find OER. Almost all teachers indicated that it would be helpful if they could receive an overview of available OERs within their teaching subject. Availability of relevant OERs could also be improved through collaboration in teacher communities with peers, both on an institutional level as on a national level with other universities, because curricula are often quite similar across schools and institutes. The second theme concerned teachers' capacity to use or share OERs because even if teachers have access to relevant OER, several teachers stressed that pedagogical and technological support must be available. To integrate OERs within their curriculum, support could be organized by on-the-job support or through formal training sessions. The third theme, institutional support, consist of teachers' need of facilitating conditions to increase OER adoption. Currently, teachers are uncertain about what is allowed in relation to sharing and using resources. Communicating guidelines, for example through a vision or a policy on OER, could support teachers in knowing what is allowed when sharing and reusing resources.

In **Chapter 3**, we illustrated how teachers assessed 'big' OERs (i.e. institutionally generated resources designed with explicit teaching aims) on quality. In this qualitative study, a total of 11 teachers participated who were all working at the same university of applied sciences. Teachers were divided into three groups based on the subject they teach: business analytics, intercultural communication, or research methods. These subjects were chosen because they are taught across several schools within the institute. Each subject group consisted of three or four

teachers, and came together once to discuss several OERs that were provided by us.

We identified five themes that cover the range of elements that teachers mentioned in their assessments of the provided OERs. The first theme related to the *content* of the resource which teachers assessed for relevance, scope, correctness, structure, and the alignment of the depicted context with students' future professions. The second theme related to the *design* of the resources. Teachers examined the pedagogical design of a resource and whether it matched their teaching approach. Moreover, to motivate students to use the resources, they also reported OERs should be attractive and offer a mix of learning modalities. Teachers also studied the granularity, the developer, and the production date of the resource. The third theme, *usability,* referred to the way teachers assessed and valued OERs on layout, ease of navigation, and utility from a student perspective. From a teacher perspective they particularly valued ease of access and gaining insights into students' progress. The fourth theme, *engagement,* related to the value teachers assigned to opportunities for students to interact with the resource. Teachers appreciated exercises, either with or without automated feedback mechanisms, the availability of videos to engage students, as well as other interactive features of the resources. The last theme referred to the *readability* of the resources. OERs should have concise, to-the-point text that is not too academic, especially for resources that are not in students' native language.

Additionally, individual interviews were scheduled with teachers before and after the plenary meeting, in which they were asked to create association maps on OER to see if they perceptions on OER changed, and to share their experiences, if any, with the use of OERs in their teaching. Three main themes emerged: (i) awareness regarding OER changed from a limited or shallow understanding to an increased understanding of its defining characteristics and licensing mechanisms; (ii) teachers' attitude changed from doubtful preconceptions regarding quality to an appreciation of the value OERs could have for their lessons; and (iii) practical issues remained a concern but changed from uncertainty and questions around practical issues involved in using OERs, to an understanding of the actual implications of these issues due to their experience with OERs. Overall, teachers were quite impressed by the quality of the resources and some of them also shared resources with their colleagues. Yet, only three teachers actually used resources in their teaching, mostly as additional resources. Teachers indicated difficulties with implementing OERs in ongoing courses due to the effort and time to fit the OERs to their needs as well as to their current course design.

The final two studies were conducted within the context of an inter-institutional community on OER. This community, called *Together Nursing*, involved 15 universities of applied sciences in the Netherlands that offer a Bachelor programme Nursing. The purpose of the community was to collaborate and share practices, knowledge, and OERs. This specific inter-institutional community around OER was chosen because (i) this community already had the prerequisites in place since they

explored the feasibility of this collaboration in a prior project, (ii) the institutes had collaboratively designed a new curriculum, and (iii) new topics in this curriculum compelled institutes to develop new resources. However, OER initiatives often struggle to become sustainable once funding ends due to decreasing user engagement. To cultivate the user group, brokers play an important role within distributed communities in which ties need to be established to connect several local groups into one community (Wenger et al., 2002). Brokers are individuals who facilitate transfer of knowledge and resources, and coordinate efforts across organizational boundaries (Akkerman & Bakker, 2011). Brokers are defined by their role rather than their organizational position.

In **Chapter 4**, we specifically focused on the role of brokers in cultivating the inter-institutional community. In this qualitative descriptive study, we used cultural-historical activity theory (Engeström, 1987) to understand the complexities associated with this role of brokers. Qualitative data were collected which included project documents, process reports, reflection reports and an online focus group. The inter-institutional community aimed to create a sustainable collaboration between institutes on sharing practices, knowledge, and OERs. Teachers could share and find resources in a repository and further connect and share knowledge in an online community. Brokers undertook several actions to endorse the set objective, which we grouped in four focus areas: (i) encouraging teachers to engage with the inter-institutional community; (ii) stimulating the use the OER repository; (iii) stimulating the use the online community; and (iv) creating the necessary organizational structures within the institutes. Brokers concluded that, a small-scale, personal, and content-oriented approach to encourage teachers to engage with the OER repository and the online community was perceived as the most valuable, although a wide range of instruments were needed to foster the transition to the new collaborative practice across institutes. Brokers were positive about the necessary conditions that they had created within their institutes. For example, collaborations with libraries were initiated, or engagement with the inter-institutional community became part of HR interviews. Brokers' actions had impact because more and more teachers started using the OER repository and the online community, and there was a widespread enthusiasm to collaborate. Moreover, brokers mentioned that barriers between institutes diminished, resulting in a strengthened collaboration across institutes. Their actions also impacted practice in unexpected ways. For instance, some noticed that teachers gained an increased awareness of the curriculum outline, and other brokers stated that the adoption of the common quality model led to more conversations on the definition of quality by the institute's curriculum committee.

Nevertheless, brokers experienced several role conflicts. For example, brokers felt that their actions had not led to a major transformation of the teachers' way of working. The use of the inter-institutional community to exchange knowledge and resources was still limited as only a small number of teachers actively participated. Moreover, brokers struggled with the ambiguity and responsibilities of

their role. For example, they experienced the burden of realizing the formulated objective without the commitment of the team and with limited or no managerial support. Moreover, brokers were also impacted by several organizational constraints they were confronted with and had limited capacity to counteract these. Reorganization, personnel changes, and the impact of Covid-19 were all factors that diverted the focus from spanning boundaries between institutes.

Inter-institutional communities on OER can only exist if teachers feel that participation gives them value, otherwise engagement will decrease and the community might cease to exist. Thus, for the longevity of a community it is important that teachers keep engaging with the community so that knowledge and resources are continuously being shared and kept up to date. In **Chapter 5** we sought to illustrate teachers' valuing of their participation in the community. A mixed-method design was employed in which we collected user statistics, administered a questionnaire, and conducted semi-structured interviews with four teachers. The Value Creation Framework (Wenger et al., 2011) was used to analyse our data which enabled us to illuminate 'the added value *for* community members as defined *by* community members' (Dingyloudi et al., 2019, p. 217). To create an account of value creation, we analysed the data and created personal and collective narratives which were further analysed on the five defined cycles of value creation (Wenger et al., 2011): *immediate value* are activities and interactions that have value in and of themselves; *potential value* is knowledge value that has the potential to be realized later; *applied value* relates to changes in practice as the potential knowledge capital has been leveraged to change practice; *realized value* represents performance improvement; and *reframing value* refers to the redefinition of success at the individual, collective, and organisational levels. By combining data we were able to formulate and illuminate teachers' valuing of their participation in the inter-institutional community, both with personal narratives (interviews) and collective narratives (user-statistics and questionnaire).

     The findings of our study illuminated that value, traversing all five value cycles, was created in the inter-institutional community. The quantitative data mostly highlighted the immediate value. In the period between the start of the project in 2018 until mid July 2021 (six months after the official end of the project), a total of 1458 resources were shared in the repository, including third party resources. The total number of members of the online community gradually raised to 891 users in July 2021. In total, online community members created 586 posts and received 789 comments and 907 likes. The highest number of activities relate to the chat messages: 1557 messages were send. This data showed us that participation continued after the official end of the project. In general, by combining quantitative and qualitative data, it became clear that major value creation occurred from teachers' personal needs, resulting in dominant immediate and potential values. The inter-institutional community provided a range of benefits to the teachers, including the opportunity to network with other professionals, have access to resources and ideas, collaborate on projects, and receive aid during

emergency teaching. Some teachers changed their practice by reusing OERs in their teaching or by creating new practices with peers from other institutes. Less realized and reframing values were identified in our data. It could be that it was too early to discern these values because teachers were still getting acquainted with the community, or that teachers did not yet articulate these values as it required them to reflect upon abstract notions of success.

We recommended inter-institutional communities to use The Value Creation Framework (Wenger et al., 2011) to look forward and examine how additional value creation can be promoted. Moreover, to further endorse the sustainability of an inter-institutional community, it is vital to link the activities and connections that teachers deem valuable, the 'what's in it for me', with the burning issues of the organization(s) to realize the necessary managerial support to continuously facilitate space for teachers to learn with and from each other.

In **Chapter 6** of the dissertation, we reflected on the main findings of each study and provided recommendations for future research to further enhance our understanding on OER adoption and sustainability of OER initiatives in higher education.

In Chapter 2 and Chapter 3, we examined to what extent teachers currently use OERs, what kind of support they prefer to foster OER adoption, and how they assessed OERs on perceived quality. The findings indicated that teachers' awareness of OER is limited and that they would like to be supported in finding relevant and high-quality OERs and using them in their classes. Moreover, apart from quality concerns, teachers did not adopt OER due to issues with implementing OERs in ongoing courses. We therefore strongly suggest to underpin the usability of OER during curriculum reforms or course transformations. One specific way to increase reuse of OER during such reforms is to let teacher teams collaborative assess relevant OERs. During such meetings, support from librarians and educational technologists must be provided to help teachers answer questions, and overcome issues with regards to the '5R' characteristics. Teachers sometimes discarded resources because, for example, the pedagogical design did not fit the learning approach they were using, the relevance of the content and the provided examples within the OERs did not align with students' future professions, or the readability of a resource did not match with their students' language skills. One of the advantages of OER, however, is that teachers may adapt and revise the resources to overcome these issues. For example, to mitigate the readability issue, text simplification of OERs has proven to make them available and effective for students with a wide range of English proficiency levels.

In Chapter 4 and Chapter 5 we explored an inter-institutional community on OER. Cultural-historical activity theory (Engeström, 1987) provided us with a valuable conceptual framework to not only analyse the complex context brokers operated in, but to also explore the conflicts they experienced and the origin thereof. Surely, the findings showed that brokers experienced conflicts such as limited willingness among teachers to share resources, a high enrolment of students

resulting in large numbers of new teachers, and the pressure of the stipulated responsibilities of their role. These conflicts evolved from the demanding context they were operating in, the ambiguity of their role, and the organizational constraints they were confronted with. Although our main focus in this dissertation was on the role of brokers, bridgers and brokers could complement each other in spanning boundaries. Bridgers are persons that have a leadership position and concentrate on creating partnerships across institutional, organizational, and community boundaries by connecting people and resources. We deem a close collaboration between bridgers and brokers as beneficial, because connecting bridger and broker roles in inter-institutional communities on OER might mean that potential conflicts are dealt with at the appropriate level. Furthermore, to be a competent boundary spanner, a set of cognitive, social, and emotional competences need to be mastered. Training trajectories to develop these competencies can support brokers to acquire a sufficient level of competency to be able to fulfil their role effectively. For example, brokers' peer-mentoring programmes could be a method to enhance boundary spanners skills through a combination of problem-based sessions, peer review sessions on experiences and conflicts, and mentors that are available to discuss issues regarding realizing change.

Brokers' actions to create the important conditions that support collaboration across boundaries will, however, be futile if teachers do not experience value in engaging with the inter-institutional community. To create an account of value creation, both personal (e.g. the experience of the teachers) and collective (e.g. the developed identity of the community) narratives can be collected. We suggested to frequently evaluate value creation, both on short- and long-term value, throughout the development of the community by analyzing statistics or by talking to teachers, and to actively feeding it back to the community to further promote engagement. Even so, it is vital for communities that there are members who actively contribute, engage, and help others but communities often have a relatively small group of active members. A social perspective in which collaboration is part of teachers' profession could increase engagement in communities. It might be necessary to move the most frequently asked question of 'what's in it for me?' to 'what's in it for us?' as to not only stress the individual value of OER communities (such as access to resources, help with challenges, connection with peers), but to also highlight the public values (such as equitability, inclusivity, accessibility).

Next, several practical recommendations for practice derived from this dissertation. First, we advocated, like many others, that teachers should be supported by librarians and educational technologists in the OER re-use phases of searching, adapting, and sharing OER as these phases comprises complex copyright and open licensing issues. As mentioned before, we especially see value in exploring OER collaboratively in teacher teams during curriculum reforms, in which is it important that sufficient time for teacher teams should be allocated to collaboratively explore and discuss the possibilities and opportunities OER might

offer. Time that is needed so that teachers can collaboratively assess specific OERs, to align them with their learning objectives, and to adapt them to their specific contexts.

Second, because the findings in this dissertation showed teachers' limited awareness of OER which impacts the acceptance and use of OERs, we recommended to integrate the concept of OER within teaching qualifications, in curricula of teacher education programmes, and faculty development so that a broad awareness of OERs can be realized and teachers are encouraged and enabled to gain some experience with using OER in their teaching.

Third, to ensure that OER communities create and share resources that teachers deem relevant and of good quality, beginning communities should start with exploring teachers' needs for resources. We advised them to (i) gain insights into teachers' and students' preferences for OER in their teaching; (ii) to create a shared vocabulary so that resources can be connected to a common standard; and (iii) to collaboratively create an accepted quality model that be used to peer-review OERs before publication. Moreover, we suggested that inter-institutional communities on OER should emphasize and highlight the quality procedures that are employed within the community so that teachers will return to search for relevant and quality resources.

Fourth, we wanted to stress the advantages of OER for students' benefits. Inequity is a concern, and students' financial situation is an increasing issue in higher education. Some students simply cannot afford buying course materials, others decide to save money by not buying the recommended materials or to not switch studies due to the costs of buying new materials. Hence, we suggested to explore OER use in the first year of higher education because most courses across institutes share similar content. Institutes or teachers could collaborate on a national level (e.g. in inter-institutional communities) to create, revise, or remix OER for more generic courses. OER can be created collaboratively, or existing OER could be adapted to the local context. For example, OER can be either translated to students' native language or revised to simplified English; and context specific examples can be added to align it to students' future professions.

Fifth, open pedagogy can contribute to prepare students to master the skills they need for their future role in a knowledge-based society. For example, students can be invited to create tutorials on certain topics that can be shared publicly, they can be encouraged to reuse and remix resources into new products, or can become an active member in an open collaborative community. Thus, creating value for society is a core principle of open pedagogy. Subsequently, we expect that this shift to open pedagogy, where the conversation is focused on the value of openness for teaching, learning, and society, can help institutes to further sustain OER and openness in higher education.

Overall, this dissertation contributed to available literature and practices on OER adoption. More specifically, it provided insights into teachers' needs for support and their perspective on OER quality. The findings illustrated the potential of OER for

higher education, but teachers' perspectives of OER quality remains an ongoing concern. Inter-institutional communities could diminish these concerns because resources are shared with peers within a specific domain. The role of the broker to cultivate the community is essential, but they should be sufficiently supported and empowered. Moreover, teachers must feel that the community provides them with value to foster its sustainability. A focus on value creation within such communities, both individual and public values, combined with quality assurances processes for OER, could be a way to promote and increase sustainable OER adoption, thereby contributing to enhance openness in higher education and bringing OER adoption beyond the question 'what's in it for me'.