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Normative Objects in Educational Infrastructures[1]

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Abstract. This paper describes open learning and teaching materials, so-called open educational resources (OER), as visualizing, economic and normative objects, and classifies these into a plenum with interwoven practices and arrangements of material (Schatzki). The plenum determines how the actors, their socio-material practices, and the associated political and technical frameworks each generate different interpretations of OER for the actors. The discussion is based on a case study of a video platform providing academic content. The empirical example, studied via document analysis and content analysis, of the TIB AV portal as an educational infrastructure offering videos of scientific conferences and teaching as an online service shows how the normative requirements to open educational resources are produced by the infrastructure. The paper focuses on the argument that the normative dimension of OER be part of material arrangements. The normative OER model is implemented in the infrastructure, while the social norms of openness are provided by the service. OER in terms of normative objects embodying the norm of openness are produced performatively through repositories.

1 Introduction

This paper shows how learning and teaching materials can be framed as different objects of knowledge: as visualizing objects, as economic objects and as normative objects. Open learning and teaching materials were first labelled “open educational resources” (OER) in 2002 by UNESCO and a global movement (community) has since developed around this concept. An early initiative in 2001 is MIT OpenCourseWare.[2] An online open publishing platform for educational materials from MIT (Massachusetts Institute of Technology) courses. For 20 years the non-governmental organization Creative Commons (CC) has designed license models to enable the practice of sharing knowledge.[3] In 2007 the Cape Town Open Education Declaration issued a principle, strategy and commitment to spark dialogue, inspire action and help the open education movement grow.[4] The normative aspect is thus acknowledged. Nevertheless, OER is a minor phenomenon in higher education. Research in the activist field of the *open movement* has a mostly technical focus on implementing infrastructure. This

[1] I want to express my sincere thanks to all reviewers of the paper for elaborated and helpful feedback, and the conference organizers and participants for fruitful comments within the session.

[2] https://ocw.mit.edu/

[3] https://creativecommons.org/

[4] https://www.capetowndeclaration.org/

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contribution wants to move the focus to the socio-material arrangements of infrastructure. Seeing OER as normative objects: does the digitalisation of learning and teaching materials based on OER principles influence the concerns of teaching and learning in terms of content, location or method? This question creates a discursive framework for deciphering the digital nature of the mediality and performativity of digital educational infrastructures provided by these learning and teaching materials and asks what they achieve in their digital materiality, and how they pre-configure the interaction order of the participants and their practices. The normative model that is inscribed in this form of digital learning objects is explicated in the definition of open educational resources.[5] The example of the AV portal of the German National Library of Science and Technology (TIB) shows how this model is reproduced performatively in digital educational infrastructures. The TIB AV portal is an online service providing academic videos with a focus on technology, mathematics and natural science, including lecture and conference recordings as well as (open) audio-visual learning and teaching materials.

Below, the open educational resources will be followed as actors, in line with Bruno Latour's "follow the actors" (2005, p. 12). First, OERs will be described using the UNESCO definition and framed as normative objects. This will be framed by drawing on Theodore Schatzki's practice ontology of the plenum of practices and material arrangements (2016). A crucial contribution of ontologies to empirical analysis is their provision of concepts and ways of thinking that help conceptualize topics and objects and formulate descriptions, explanations, and interpretations (Schatzki, 2016, p. 40). Therefore, socio-material, praxeological investigations to take the plenum of practices and material arrangements seriously and develop concepts that can grasp its nature and processes (Schatzki, 2016, p. 40). The concept of practice also enables questions concerning the reproduction and transformation of cultural orders which offer actors a meaningful scope for action (Schäfer, 2016, p. 10). Based on the materiality of practice, the interactional orders in the production of OER can be shown in the use of objects and symbols.

2 Open Educational Resources as a Concept and an Object

Open educational resources can refer to texts, images, graphics, course plans, slide sets, audio and/or video recordings, scripts, textbooks, etc. The term "open" implies that this educational material should be freely accessible. Since OER are primarily a

[5]As can be seen in Downes (2001), the term "learning objects" focuses on the technical conveyance of learning and teaching materials. In its technology-conveyed capacity as "resources for distance education worldwide", it precedes the term open educational resources in a certain way.

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digital phenomenon, this means that the material should be: (1) available online without such barriers as paywalls or membership; (2) in file formats that do not require the use of software fenced off with paywalls or membership; and (3) available under an open or free licence (such as the Creative Commons licensing models) where the author universally releases extensive usage rights, for example the right to reproduce, redistribute and/or edit the material. So, they have the practice as their goal and law as their means. In their materiality and mediality, open educational resources are everyday learning and teaching materials available in various media (speech and image representations) and materialities (sounds reproduced through speakers, light shed through projections, paper and ink, blackboard and chalk).

In the open educational resources movement[6] (Knox, 2013) which is shaping the OER discourse, the UNESCO definition is usually (2019)[7] used to describe OER: "open educational resources are teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions." This definition incorporates two specific sets of standards: First, social norms of open and public access, i.e., the first and second implications of the term "open" described above. Second, legal norms: copyright applies to all educational materials as works for the protection of intellectual property, but the free licences contained in OER represent a universal usage contract in terms of copyright law. The use of free licences requires identifying the materials as OER via a symbol, which nevertheless does not constitute an OER label per se.

In addition to these sets of norms inscribed in the definition and the term itself, the OER model contains two normative promises that UNESCO formulates on its website (2019): "UNESCO believes that universal access to information through high quality education contributes to peace, sustainable social and economic development, and intercultural dialogue. OER provide a strategic opportunity to improve the quality of learning and knowledge sharing as well as improve policy dialogue, knowledge-sharing and capacity-building globally." The normative promises contained in OER as learning and teaching materials framed in terms of educational policy are: First, the promise of equal opportunities and fairness in education. Open educational resources are intended to open up education to everyone. Second, to increase the quality of education; education should convey current and true knowledge. Open educational resources make a promise to "decentralize, democratise and emancipate" education with "digital technology utopianism" (Dickel and Schrape, 2015). These inscriptions

[6]The field of the open educational resources movement is interwoven with other movements such as open source, open access, open data, open content and open science.

[7]In the field of the open educational resources movement, OERs are defined at various points by different activist institutions and people, which in essence do not differ or differ only slightly in wording.

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and promises express the politically framed model of OER, to which I will return in the application of the plenum of practices and material arrangement of open educational resources.

OER as visualizing objects: I use the term "visualizing objects", to grasp the basic function of learning and teaching materials. Visualizing objects enable knowledge to be conveyed by showing them with the help of their material and medial properties. Rheinberger (2010) shows how different modes of visualization convey scientific knowledge ("epistemic imaging strategies"). This can take different forms: (1) the interweaving of instrumental technologies, scientific objects and corresponding forms of visualization, (2) their presentation in exhibitions and lectures, or (3) descriptions in academic texts. Visualizing objects can medially represent epistemic objects (Knorr Cetina, 2001) and didactic objects (Kalthoff et al., 2020).[8]

OER as economic objects: if one considers copyright and the property rights associated with it, OER should be considered with regard to their value as intellectual property and, if applicable, any devaluing. In the open educational resources movement, it is assumed that OERs are created by teachers (and learners) in the course of their everyday teaching/learning practice.[9] According to Marx (2013, pp. 49–61), the teachers' everyday work products become commodities for which socially necessary working hours were expended. By publishing OER under a free licence, teachers (and learners) as content deliverers exercise the property rights in unusual ways by granting everyone far-reaching non-exclusive usage rights free of charge, to the resources and thus to their work product. In line with the OER concept, this waiver is free of charge. In this way, OERs, as Marx might put it, lose their exchange value as a commodity, which no longer corresponds to their real value relationship.[10] This economic perspective is interwoven with the normative perspective.

OER as normative objects: teaching and learning materials become promising through the normative promises of OER. Turner (2010, p. 16) notes that normative objects contain tacit rules hiding behind other rules. Nonetheless, these rules are necessary. But in contrast to Turner's understanding of normative objects where their tacit rules make them necessary and able to do things that explicit objects cannot do,

[8]All epistemic objects and didactic objects can also be visualising objects. However, not all visualising objects are epistemic objects and didactic objects.

[9]It is inherent in the idea of OER that these new resources are in turn created from existing OER. The users should, to a certain extent, find themselves in a role of prosumers, as producers and consumers in one. The lecturers, as content deliverers, have to deal with the infrastructure and thus in the second level with the models implemented by technicians and engineers.

[10]A common argument for this is that the positions of people who teach at universities and who produce the material are already publicly funded. Hess and Ostrom (2007)) plead for "understanding knowledge as a commons." For example, the Cape Town Declaration ((2008)) demands: "Making publicly funded educational resources open to the public by default is not only a just and fair practice, it also unlocks benefits for society."

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the normative rules of OER are not hidden, but are a prerequisite for their creation and labelling. However, they take a back seat to the primary functions of OER as visualising objects. At the same time, visualising objects only become open educational resources through normative framing and labelling through open licences. On the other hand, the normative framework of OER directly influences their meaning and value as economic objects.

3 Plenum of Open Educational Resources

Schatzki (2016, pp. 28–29) identifies three lexical commonalities in practice theory: (1) “the term 'practices' is central to their theories and analyses of social phenomena”, (2) “practices [understood] as social in character, at least in the sense of being something carried out by indefinitely many people”, and (3) “social phenomena such as organizations, power, science, education, and transportation are understood as constellations of, aspects of, or rooted in practices.” Practices are collections of actions and sets of rules and resources (Giddens, 1979; Schatzki, 2016, p. 29). In “institutional sectors such as economy, polity, law, and discourse are distinguished by which of the three structural types of rules and resources (signification, domination, legitimation) a given sector organizes” (Schatzki, 2016, p. 29).

Bearing that in mind Schatzki (2016, p. 31) defines practice ontologies as flat ontologies, “because (1) they treat practices as the central element in the constitution of social phenomena; and (2) practices are laid out on one level.” Schatzki rejects ontologies that distinguish between two separate levels of the social, i.e., a “micro” as the locus of social interactions and “macro” as the locus of social structures. Practices are to be understood as open, “spatially-temporally dispersed sets of doings and sayings organized by common understandings, teleo-affectivities (ends, tasks, emotions), and rules” (Schatzki, 1996, 2016, p. 32). Material arrangements are “linked bodies, organisms, artifacts, and things of nature” (Schatzki, 2016, p. 32). “Practices and arrangements form bundles in that (1) practices affect, alter, use, and are directed toward or are inseparable from arrangements; while (2) arrangements channel, prefigure, and facilitate practices” (Schatzki, 2016, p. 32). The “site of the social” lies in these bundles (Schatzki, 2002). There are six types of relations between practices and arrangements: causation, use, constitution, intentionality, constraint and prefiguration (Schatzki, 2016, p. 32).

According to Schatzki (2016, pp. 32–33), “The objective spatial-temporal spread of the plenum of practices and arrangements defines the boundaries of the possible objective spatial-temporal extensions and shapes of social phenomena”, which means that no priority can be given to the local situation. This is in contrast to Erving Goffman (1983) ethnomethodological and phenomenological approaches, which always

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emphasize local situations. As Schatzki writes, “The activities, entities, rules, understandings, and teleologies that are at work in any interaction or local situation are elements of phenomena - practices, arrangements, and bundles thereof - that stretch over time and space beyond such situations. Indeed, these items often come to be at work in interactions and local situations because they are components of practice-arrangement bundles” (Schatzki, 2016, pp. 32–33). Therefore the social does not exist separately above this plenum and macro and micro are not definable levels of the social (Schatzki, 2016, pp. 32–33). Schatzki rejects the perspective of Geels and Schot (2007, p. 406), who view the macro level as stabilised, material infrastructures which, as “gradients of force”, make it easier or more difficult for people to perform certain actions within them. Schatzki (2016, p. 38) says it would be “a mistake to shear off the material dimension of society and to reify it as a relatively hard form that shapes social life”. The social consists of bundles of practices and material arrangements, the material dimension of which is considerably malleable. Arrangements continually evolve with and as part of changes in bundles. The material dimension also affects activities in a variety of ways. Only nature can be treated as relatively immobile.

Schatzki (2010) describes the bundles of practices and material arrangements in an essay relating to horse breeding in the bluegrass region of Kentucky. It shows how the material participates in the social. The interweaving of practices and arrangements in horse training is connected and intertwined with those of horse breeding, horse trade, stud farms, and equestrian sport itself. The interrelationship between the material and natural entities is described as follows: “The pond makes it easy to let thirsty horses get a drink, hard to lead horses directly to the barn from the paddocks (i.e., through the pond’s middle), and invigorating to gallop one’s mount through its shallow end” (Schatzki, 2010, p. 140). Based on the history of the region, he develops the transformations of these webs (Schatzki, 2010, pp. 141–144) from the arrival of European settlers and their farming practices to the acquisition of food, the spatial-temporal cultivation of plants and the landscape, the equipment used, and the work practices used. Up to the region’s transformation into a tourism region known for its horse breeding and the associated material facilities of horse farms and riding and sightseeing practices.

Theodore Schatzki (2016) suggests a plenum of practices and material arrangement as a practice ontology. Ontology is the science of being, it centers on the categorization of the being and the fundamental structures of reality. It intends to create a classification system of basic types of entities (concrete and abstract objects, properties, issues, events, processes) and their structural relations. Thus, practice theory is always ontology. However, what are the entities and structural relations of the social? Figure 1 shows the plenum of practices and material arrangements grouped around the phenomenon of open educational resources. Hilmar Schäfer (2016, pp. 10–

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11) describes, following Andreas Reckwitz (2006), how practice theory, as the integration of interpretative and structuralist cultural theories, leaves two questions unanswered: (1) What options do participants within cultural orders have? (2) How do cultural orders, their reproduction and transformation develop? This gives rise to three analytical dimensions of socio-material practices that I would like to add to the plenum of practices and material arrangements: action capabilities, transformation and reproduction.

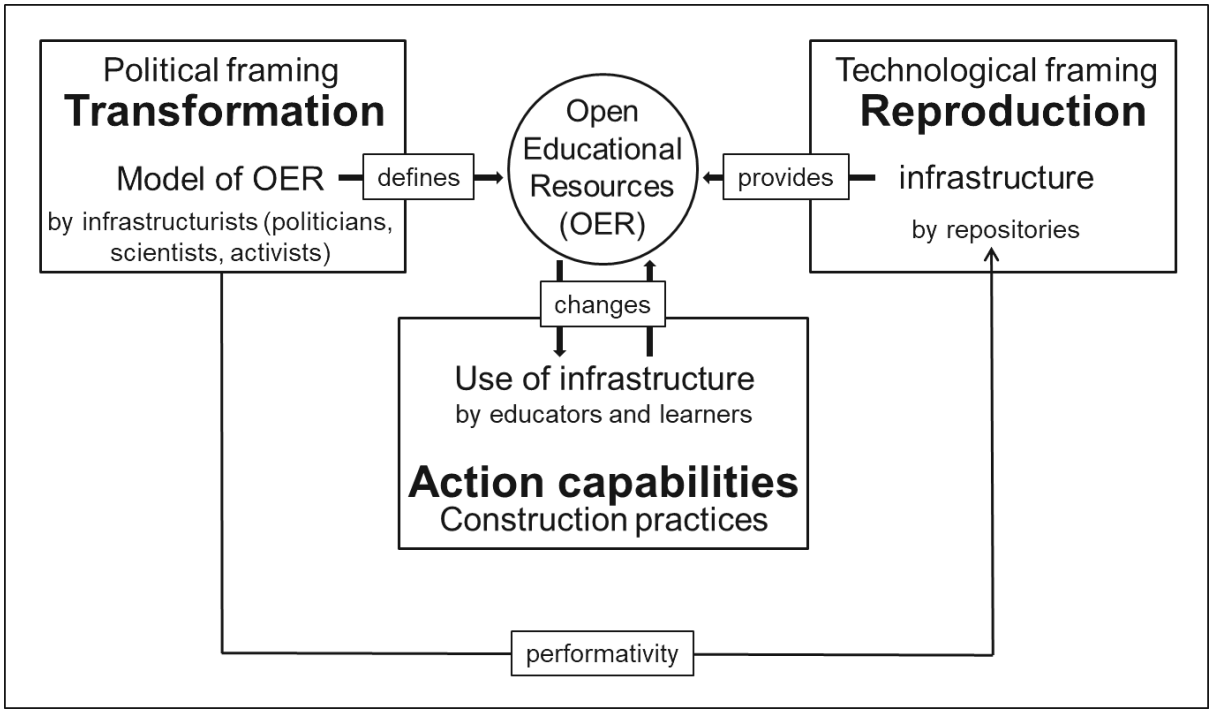

Fig. 1. Plenum of open educational resources

In order to turn learning and teaching materials into OER, various production practices are necessary. The individual practices, the creation of texts and graphics, the production of image and sound material, the search, combination, licensing, keywording, labelling and provision of educational resources, but also information about the practices and the OER model should be understood relationally and cannot be viewed in isolation; they have to be explicated in relation to the practices that preceded them, their social context and their material endowment (see also Schäfer, 2016, p. 11). Most of these practices are associated with computers and the respective input and output devices: screens, touchscreens, keyboards, mice. But there are also practices that are not (directly) connected with computers. In addition to digital pixels, ink and paper can also be used in the creation of texts and graphics, for example, for initial drafts and brainstorming. Image and sound materials are mostly recorded with digital cameras and audio recorders, but the practice of speaking (for example in a lecture) and the captured images (either as part of the lecture or to visualize epistemic

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or didactic objects) remain mostly outside the digital. Material can be searched in library holdings via an individual desk or an office computer, via online catalogues, and using internet browsers. But it can also take place in the library itself, in interaction with the library staff at the counter, but also not least by strolling through the aisles and browsing the holdings. Not least, conversations and discussions among colleagues about their current work over a cup of coffee or lunch are also important. All these practices and their material arrangements are inscribed in the teaching material. Ultimately, however, these socio-material practices are translated into the practices that produce digital learning objects. It should be noted that any consideration of open educational resources usually starts with the requisite end product. This fact must be considered in that, in their production practices, educational resources can only be labelled “open” at a later point in time through open licences. The decision to publish material does not necessarily have to be made at the beginning of the interwoven practices. The creation and use of learning and teaching material does not mean that it is also publicly available as an OER (Beaven, 2018).

The normative context of open educational resources is evident in the technical framework for making media available and the policy framework that sets the definition of OER. The relevant infrastructures will require their users to apply a certain method that will suggest the creation of resources in line with the OER model. Online educational infrastructures are, by definition, available on the internet; they can take the form of learning management systems integrated into the everyday media practices of courses (the open-source platforms Moodle or ILIAS are examples) or separate repositories outside of the everyday media practices of course modules. Repositories are document servers that secure digital learning objects and their metadata, describe the objects in a structured manner, and make them accessible. In the case of OER repositories, they are a form of virtual library providing more than just digitised books. They treat OER as normative objects in line with the OER model. They create an ordered openness for digital learning objects. The services sometimes contain the material for entire course modules or structured individual material and are aimed at teachers and/or learners; the material can either be downloaded or accessed within the service environment. In the TIB AV portal, for example, the videos can be accessed and viewed directly in a browser. In addition, the portal provides automatic video analyses for the videos in real time, for example, allowing written language (e.g. text on transparencies) to be searched through text recognition and spoken language to be displayed in the video as a transcript and made searchable through voice recognition. The repository can thus become a virtual reading room or lecture hall. Repositories allow different actions by users, while also preventing other actions by simply not including them in their setup, e.g., direct editing resources in text, picture, audio or video. These medially conveyed options for action are the mediators between

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the normative objects and the infrastructure. At the same time, the learning objects are decontextualized, as they are removed from the original context of the lesson. A separation of knowledge and context is not appropriate, since knowledge only emerges in this very context. Furthermore, lessons themselves must be seen as an educational resource. In this sense of de-/recontextualisation there are no differences between OER and traditional textbooks, if they stand alone.

The policy framework defines OERs as normative objects. An OER model is created and is then used to define what constitutes OER. Educational policymakers, activists in the open educational resources movement, and academics in media didactics, educational science, computer science, and library and information science continue to work on this model by providing recommendations, definitions and policies. To borrow a term from Eva Barlösius (2019, p. 21), these actors can be referred to as "infrastructurists". The OER model is transforming the concept of education and learning/teaching materials. In various countries, OER policies are being developed that concentrate on the production and provision of OER and whose educational policy goals correspond to the normative model of OER. At the same time, however, it should be noted that these policies do not automatically mean that this model is adopted in the teachers' and learners' practices (Bossu and Stagg, 2018; Mulder, 2013; Stacey, 2013). Michael Kerres and Richard Heinen (2015, p. 34) propose a focus on infrastructural framework conditions in order to promote the spread of OER (see also Heck et al., 2020). Infrastructurists are trying to implement the theoretical assumptions of open education in the repositories as well as structure and promote OER usage. With this in mind, search systems and metadata schemes are being developed that should make it easier to find the learning objects described in the metadata.

The use of infrastructures should assist university instructors in the creation of OER. By searching for or finding and creating materials, their options for action become free. Searching for external material is part of any teacher's practice (Beaven, 2018), but this takes place less specifically in OER repositories than in general online (Baas et al., 2019). Open solutions activists generally assume that educational materials can be produced by university lecturers and students in the course of their teaching and learning activities and (voluntarily) made available to the academic public. By using digital learning platforms such as Moodle or ILIAS, teaching practices can be changed and restructured in such a way that they favour the creation of OER. The OER community refers to teaching practices as "open educational practices". Yet OER remain a niche phenomenon. Beaven (2018) emphasizes that the use and sharing of teaching and learning material within a community, between students and teachers and among colleagues is common, but invisible and done in private, in what she calls a "dark reuse" (see also Baas et al., 2019). The public sharing of self-created materials

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as OER occurs only to a very limited extent, but, when it is done, it takes place in public repositories (Cardoso et al., 2019).

The OER community describes the practice of use as follows: OER is used to integrate and supplement learning and teaching materials in one's own course modules. OER can be used to validate, review and/or improve one's own learning and teaching materials (Rodés et al., 2019). Content can be changed to make adjustments for individual contexts (Cardoso et al., 2019). Formal changes, such as tweaks to the wording, predominate (Beaven, 2018). While pictures, videos and online textbooks come mainly from the internet, presentations, exam materials, portfolios and course modules are either created by the user or "borrowed" from colleagues (Baas et al., 2019). Learning and teaching materials can also be adopted without changes. OER can be made available to students as additional learning and teaching materials, e.g. as self-learning units.

This comes close to the OER model for open educational resources and infrastructures. Terms such as 'change' and 'adaptation' are in the foreground. The use and acceptance of open educational resources is also the subject of research in order to develop further top-down approaches to help transform OER from a niche existence into a mass phenomenon. Open educational resources must therefore also be understood as boundary objects (Bowker and Star, 2000; Star and Griesemer, 1989), since they obviously mean different things for teachers, learners and infrastructurists. These different meanings are currently a blind spot in research, which ought to be included in the calls for further research on the transformation of higher education (Király and Géring, 2019, 2020) and OER (Zawacki-Richter et al., 2020). Now that OER has been shown both in its status as an object and in its constitution in the plenum of practices and material arrangements, a sample educational infrastructure is introduced to show its performativity.

4 Functions of Repositories

Following a qualitative content analysis (Mayring, 2014) of documents (Flick, 2018; Rapley and Rees, 2017, pp. 375–389; Wein, 2020) held by 29 German-speaking higher education repositories which make learning and teaching material openly available, the TIB AV portal was selected as the example for this paper. TIB AV-Portal went online in spring 2014. The portal is continuously developed and operated by a team of TIB (German National Library of Science and Technology). It is a web-based provider of academic videos with a focus on technology, mathematics and natural science, including lecture and conference recordings as well as (open) audio-visual learning and teaching materials. Services offered by the portal are hosting and long-term archiving of videos; automatic metadata enrichment; permanent citation with

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Digital Object Identifier (DOI); linking between video, scientific papers, research data, NameIDs; semantic search; and legally compliant publishing practices. The portal is not an exclusive OER provider. Within its collection on the basis of free licensing (via CC), many videos are not only accessible online and can also be re-used. So, the portal is for academic use. The portal can be used by scientists as well as lecturers and students.

Digital Open Educational Resources are relationally and ecologically intertwined with infrastructures (Star, 1999, p. 377) and their users in several ways. The OER sorts the participants, namely through their different technical and media performance with the (un)availability of resources in archives, how they process them at work stations, and use them in (virtual) classrooms. If the transformation of the term teaching material is taken seriously, one must ask how the intended services of an OER are provided in infrastructures. How is the OER model mapped and represented in the infrastructures? OER infrastructures usually offer four core functions on their user interface, which can be understood as a service: (1) Search, (2) Organise, (3) Help (Manual) and (4) Delivery.

Search: Searching and, hopefully, finding take place in the interaction between search services and users as searchers. Information in a complex field of knowledge is subject to search queries, especially if the complexity of the knowledge base is increased by different storage locations and the abundance of documents. The service of searching can be differentiated into two levels of search practices: the first level helps users learn how to perform a search within that service, while the second level enables acquisition of the actual piece of knowledge. Users must be readily able to make competent use of the service and so must be (self) trained in its use. By opting to use the service, it can be assumed that users will be able to use it through their (search) practices in order to fulfil their customer wishes and information needs. A second assumption is that users are already quite aware of what they are seeking, but the material must be made findable by tagging it with metadata. In addition, a certain user competence in dealing with search systems is required.

Organise: This service is mostly represented in the organisation of lists. Found documents can be saved in collections and thus made available as a list. Materials can then be added to or removed from the collections. The collections can then be shared publicly or privately. Collections can be created collaboratively. This creates a form of ordered and shared openness, not only through the list itself, but also through the relationships between the objects in the list and the people who create the list. To a certain extent, the possibilities of these collections as lists can be equated with syllabi and reading lists.

Help (Manual): The use of documents and data also includes answering questions about copyright as part of the services needed to turn users into competent

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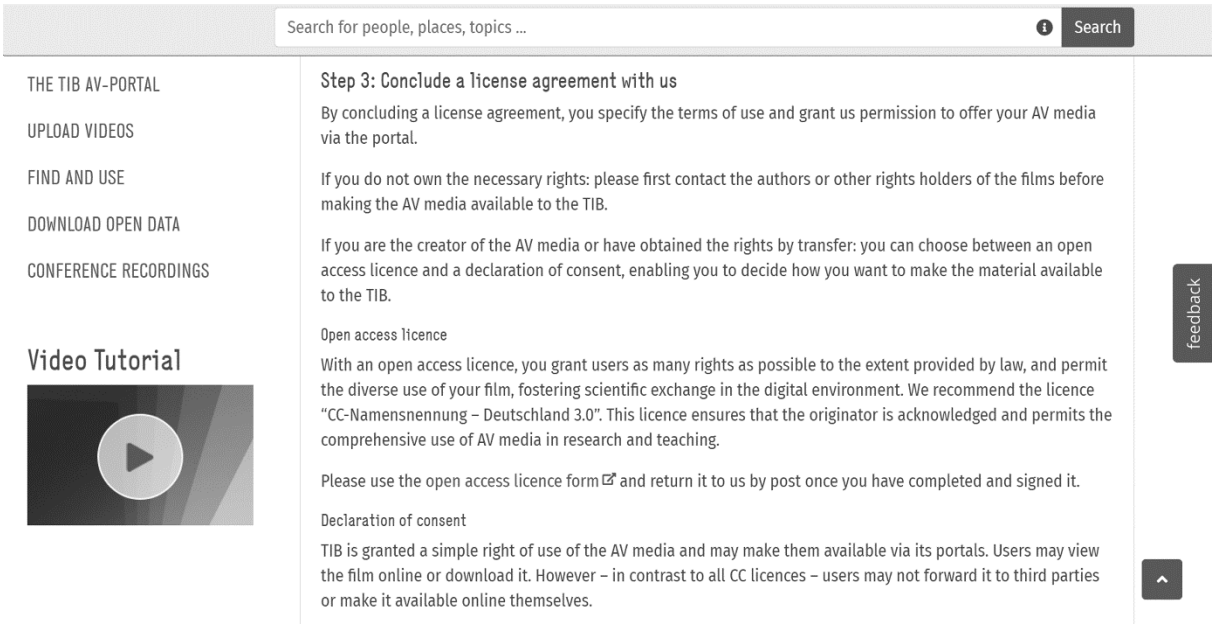

Fig. 2. License agreement

(independent) users. Infrastructures thus address users through help pages or manuals for self-socialisation. The rights and obligations of the service and users as contractual partners are presented in the service's terms of use, which not only describe the functions offered by the service, but also how these functions may and can be used. Figure 2 shows the help for license agreements, needed in the upload function to select and grant an open licence for the material.

Delivery: The learning objects are delivered from the contributor (author) to the online platform. Delivery describes the technical practice in repositories fulfilled by direct upload or sending the learning object to an editorial board. Delivery does not describe the social and collaborative aspect of contributions and the accretion of knowledge. The upload area needs to be designed in such a way that persistent identifiers (e.g., digital object identifiers (DOIs)) are assigned to the documents (automatically). Users as deliverers provide information on the title, a description of the material, its authors, etc. The users should provide as much metadata as possible to describe their material. In addition, they need to select and grant an open licence for the material. Figure 3 shows the drop-down menu for licencing.

The OER model is explained in both the help and upload functions of the infrastructure. The OER model and the restrictions on production are replicated in the infrastructure. The social norms of open and public access are provided by the service. The content can be accessed without payment or membership restrictions. Because the material can be accessed directly in an internet browser, there is no need to use software, which in turn is only available behind paywalls or membership barriers. The legal norms are stated by the explanations within the help function as well as in the pre-configuration of the upload function, which in the case of the AV portal strongly

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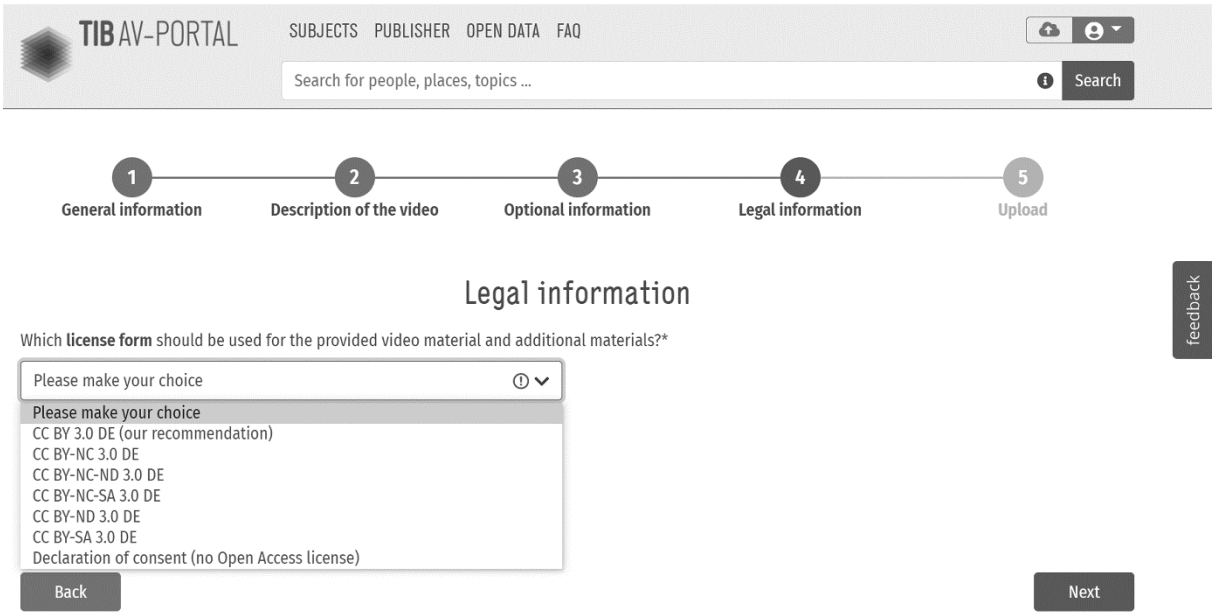

Fig. 3. Legal information

recommends users grant free licences. It should be noted that the AV portal also allows objects to be published without free licences. This means that the material licensed in this way is publicly available (open access), but may not be edited without obtaining further permission. Other services only allow free licences to be issued. In their technical framework, digital infrastructures make open educational resources medially available. Due to the technical framing, OERs are made available for reproduction in infrastructures, i.e., the repositories. The OER model is performatively inscribed into the infrastructures. However, this does not yet say whether they do justice to the interaction order of making learning and teaching material available and thus help actors in the education system.

5 Conclusion

The idea of open education has a long history (Peter and Deimann, 2013), which to this day is linked to “opening up education” (European Commission, 2013) and is linked to social issues such as: “Educational equity, fairness and inclusion, caring for the diversity of learners, open curricula and social responsibility” (Kerres and Heinen, 2015, p. 34). OER in terms of normative objects are performatively produced through repositories. The social norm of public availability and the legal norm of open processing through the granting of open licences are conveyed by the way the repositories are set up. However, this does not say whether the repositories actually implement the normative model of OER for the sake of an increase in educational equality and quality. At least, this has not yet been implemented in the repository

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technology; it lies in the resources themselves. The policy discourse around OER is not only dominated by political decision-makers, educational scientists and technicians and the perspective of university lecturers seems to be insufficiently included, so one can also speak of policy by design. It remains to be seen whether the implementation of digitalisation strategies will entail more than just transferring traditional practices, information and knowledge into a new medium (mere digitisation). In response to the question of how OER influences the interests of teaching and learning in relation to their content, this paper has shown that OER as visualising objects are to be understood as everyday educational resources and thus, in their current form, more than the mere digitisation of traditional solutions.

When understood as normative objects, OER can be seen as trying to help revolutionise education as expressed in various national policies. Through policy making, political decision-makers use OER to increase pressure towards social, economic and technological change in the education system in order to achieve the normative educational goals of increasing educational equality and quality. Within the open educational resources movement, the availability of professional, open teaching and learning materials and the associated opportunities for digital learning are perceived as a means to reach these goals. Judging the contribution OER can make to increased equal opportunities will only be possible when the OER movement is expressed in pedagogy. Either way, the established practices of teachers are put at stake. And many tend to act conservatively and maintain their academic norms and traditions. OER will put university lecturers into a new public sphere, removing them from the familiarity of seminar rooms and lecture halls into the public sphere of the World Wide Web. This not only has consequences on the visibility of their teaching work, but also has consequences for the legal status of the materials used in teaching. In this form, the digitization of learning and teaching materials through OER can transform teaching and learning issues into place and method in the long term if distance learning continues to gain importance. In this sense, digital educational infrastructures and learning objects will also gain in importance. For future research, the following questions about their constitutive role in practice must be asked for educational infrastructures as digital objects: (1) How do infrastructures change the knowledge base of their users? (2) What do learning objects mean for participants? The fact that the educational goals of increasing educational equality and the quality of education go hand-in-hand with a promise of economisation through time savings and cost efficiency raises the question of the extent to which the education system will not follow its own inherent logic, but instead subordinate itself to the logic of the economic system and confuse the goals of education with those of capitalism.

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