Driven by Emotions! The Effect of Attitudes on Intention and Behaviour regarding Open Educational Resources (OER)

DANIEL OTTO (iD)

Author affiliations can be found in the back matter of this article

]u[ubiquity press

ABSTRACT

Open Educational Resources (OER) have become widespread, but constantly lack adoption. The various studies that address this lack predominantly focus on structural causes (e.g. lack of time, legal uncertainty) while omitting individual factors. However, the latter especially can yield insights into the 'black box' of individual drivers for OER engagement. Employing a theoretical concept of attitudes, we investigate whether feelings and emotions or knowledge and beliefs mainly drive intention and behaviour regarding OER. Based on our theoretical concept, we designed a survey and distributed it in OER related occasions to scrutinise the participants' attitudes. Our findings disclose that intention and behaviour correlate with strong emotions and feelings for the underlying core ideas and values of OER. Beliefs are more robust in the abstract than in the concrete OER benefits. It is noteworthy that beliefs are widely absent from the level of knowledge about OER. The actual use of OER, however, correlates with the level of knowledge. Against this background, it is reasonable to argue that neither exclusively dismantling structural barriers nor solely promoting OER is a suitable strategy for increasing adoption. Not until educational institutions are guided and act on the basis of the key drivers of OER, their underlying ideas and value, can they spur engagement for OER among educational practitioners. Strengthening knowledge and beliefs about OER must therefore be the next logical step.

INTRODUCTION

This research intends to contribute to a deeper understanding of why individual educational practitioners use Open Educational Resources (OER). Starting from a broader perspective, especially with the recent release of the UNESCO recommendation concerning OER at the UNESCO 40th General Conference in 2019, OER has gained momentum (UNESCO 2019). A glance at the research literature indicates that OER and related concepts like Open Educational Practices (OEP) and Open Pedagogy are well embedded in the educational discourse. Nonetheless, studies, for instance, from Bozkurt et al. (2019) and Cronin and MacLaren (2018) have pointed to the fact that more research is needed to define the concepts and determine interdependencies between them. Wiley and Hilton (2018), for example, stress that for Open Pedagogy, a wide range of competing definitions exists and that their linkage to OER remains unclear.

Notwithstanding that the interrelatedness of OER with other open concepts requires further research, the central problem of OER is that their adoption in educational practices is still low (Otto 2019). The latest UNESCO report on understanding the impact of OER underpins this observation by stating that:

> "The data suggests little evidence of wide acceptance of OER within the surveyed countries and, in many instances, OER initiatives feature largely as 'projects', without systematic integration." (UNESCO IITE 2019: 12)

As a response, several studies in numerous countries and educational areas have been conducted to examine barriers and facilitators for the adoption of OER (Chae & Jenkins 2015; Jurado & Pettersson 2015; Percy & Van Belle 2012; Schuwer & Janssen 2018). It is noteworthy that these studies predominantly focus on structural causes, such as institutional policies, funding opportunities or legal concerns, which are meanwhile all well documented. In their lexical analysis, Bozkurt et al. (2019) find that barriers in OER are one of the three most prominent themes in the literature, along with OER as a vision for higher education, and the relationship between OER and OEP. The authors point to the importance of new strategies and policies that are needed to eliminate barriers in OER.

While we acknowledge the importance of barriers and structural causes, in this article, we argue that the perspective of individual causes is often omitted as a factor that can explain the adoption of OER. Individual causes here are conceptualised as the capability of a person to make individual decisions and act on behalf on them. Transferred to the case of OER, this results in the research question of why certain individuals use OER in their educational practices. This research question reveals an additional deficit that is explicitly or implicitly inherent in many research designs relating to OER. The majority of studies aim to identify obstacles and barriers that prevent practitioners from using OER. Even though these studies provide valuable insights, another approach is to study such educational practitioners who are willing to engage in OER. This type of study shifts the focus from identifying structural barriers to rendering individual factors that might help to attract and persuade educational practitioners to engage in OER.

For scrutinising the reasons and motivations of individuals for engaging in OER, our research design is based on the concept of attitudes (Schwarz & Bohner 2007). Attitudes, in short, are defined as "a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols" (Hogg & Vaughan 2005: 150). In the prevailing understanding, attitudes consist of a cognitive (knowledge and beliefs), affective (feelings and emotions), and a behavioural (acting and behaving) component. Research findings firmly demonstrate the interrelatedness of attitudes and behaviour (Veresova & Mala 2016). If we transfer these assumptions about attitudes to the case of OER, it is possible to go beyond the boundaries of factors that hamper the adoption of OER and disclose individual factors that determine it. Thereby we also avoid the slippery slope of trying to explain why the majority of educational practitioners do not use OER. The latter is especially puzzling from a methodological standpoint because most studies survey people who are unaware of the idea behind OER or have limited knowledge about the potential benefits of OER. Consequently, we concentrate on those educational practitioners who do not need to be convinced about OER but who already use it or intend to do so. By examining their reasons and motivations, we strive to provide a deeper understanding of the role attitudes play in this process.

At a more fundamental level, we aim to lower the gap between structural and individual explanations for the adoption of OER. However, none of the two serves as a comprehensive explanation as they are reciprocally interdependent. Acknowledging and examining their interrelatedness provides helpful insights into factors that need to be tackled to enhance the adoption of OER in education.

Methodologically, our research design follows a survey-based approach. The survey was developed based on our theoretical concept of attitudes. It contains three sections, each of which captures one component of attitudes (cognitive, affective, and behavioural). The distribution of the survey occurred during a project named *OERinfo* that is currently carried out in Germany to spur the adoption of OER across all educational sectors.

The core objective of OERinfo is to create awareness among teachers and learners. This comprises the use and creation of OER and their integration in teaching and learning scenarios. Among others, Mishra (2017) stresses that empowering these actors is crucial, as they are the most critical stakeholders in the OER ecosystem. In many countries including Germany, a constant gap can be stated between the increasing availability of OER in several repositories and their limited use (Orr et al. 2017; Otto 2019; Santos-Hermosa et al. 2017).

OERinfo's strategy is to conduct concrete measures on the ground such as workshops, training and courses to empower teachers and learners to use OER. The literature underlines that those measures in educational practices are essential to enhance actual engagement with OER (Cronin & MacLaren 2018; Koseoglu & Bozkurt 2018). Solely expanding access is not a sufficient condition for the use and adoption of OER (Ehlers 2011; Knox 2013). The competence to deal with OER and to use them as a matter of principle can help educational practitioners to expand their pedagogical repertoire. Thereby, OER can emerge as an integral element within a more holistic open approach to pedagogy (Green 2017; Hegarty 2015).

OERinfo's target groups comprise all educational levels, such as schools, higher, continuing, and vocational education. Competences were imparted regarding:

- finding OER,
- using OER,
- creating OER, and
- sharing and providing OER.

For data collection, the survey was distributed at the numerous measures and events that were conducted in the course of the OERinfo project (OERcamps, conferences, workshops and training) and by using communication channels such as Twitter, e-mail, and newsletters.

Regarding the structure of our article, we describe our research approach and define our concept of attitudes in section two. The research design and our methodological approach to obtain our data are discussed in section three. Our results are presented in section four. Section five discusses the implications and limitations of our findings. An outlook and recommendations to foster the adoption of OER in education are provided in section six.

ATTITUDES AND THEIR INFLUENCE ON THE ADOPTION OF OER

As mentioned in the beginning, OER is a concept that seems well established in the academic literature (Bozkurt et al. 2019; Cronin & MacLaren 2018; Koseoglu & Bozkurt 2018; Wiley & Hilton 2018). The term OER was coined by UNESCO's 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries (UNESCO 2002). Notwithstanding that no canonical definitions exist, the latest definition provided by UNESCO defines OER as being

> "learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, reuse, re-purpose, adaptation and redistribution by others" (UNESCO 2019: 3 f.)

It is noteworthy that OER are often used in combination with other concepts of openness, such as Open Education or Open Pedagogy. However, OER are primarily content and not an educational model or practice per se (Otto 2019). The idea embedded in OER is to facilitate access to educational material and to empower people to the 5Rs; to retain, reuse and revise,

remix, and redistribute teaching and learning material as well as to develop collaborative and innovative learning scenarios (Wiley & Hilton 2018). Thereby, OER are ascribed to broaden access to education, reduce the costs of material and improve the overall quality of teaching. While this potential of OER has been recognised and discussed in the academic literature for all fields of education (Bozkurt et al. 2019; Hergarty 2015; Wiley & Hilton 2018), it has to be noted that many of these claims are still subject to debate. The aspect of adequate quality criteria for OER or the lack thereof remains unresolved (Koseoglu & Bozkurt 2018). In terms of costs, open textbooks show reduced costs for materials by simultaneously achieving comparable learning results with traditional materials (Wiley 2020). However, at a more fundamental level, concerns are raised that the overall focus of OER is too heavy on access and should move further to open processes and educational practices (Bayne et al. 2015; Knox 2013).

Despite criticism, the general turn of OER from theory to practice is visible in several OER repositories that make OER widely available and permit users to find and use them (Clements et al. 2015; Santos-Hermosa et al. 2017). In what manner these repositories can be technically and conceptually equipped has been a subject of discussion (Kanwar & Uvalić-Trumbić 2011; Kerres & Heinen 2015).

Notwithstanding the significant accomplishments regarding OER in conceptual and technical terms, one pivotal problem is the slow uptake of OER for all fields of education (Otto 2019). This absence is clearly visible in the numerous studies which have been carried out to explain the paradox between the availability of OER and an insufficient adoption of OER by educational practitioners (Hart et al. 2015; Kelly 2014; Percy & Van Belle 2012; Schuwer & Janssen 2018). However, most of the studies focus on the structural causes for the lack of adoption of OER (Guo et al. 2015; Percy & Van Belle 2012; Richter & Ehlers 2012). As prevalent causes, they identify a lack of time, legal uncertainty and institutional barriers (Bozkurt et al. 2019). Hitherto, little attention has been devoted to actor-oriented perspectives, which can be juxtaposed with this structuralist approach. Contrary to structure-deterministic approaches and their systemic holism, actor-centred perspectives argue based on the methodological individualism that actors determine the nature of the structure (Weede 1992) (See *Figure 1*).
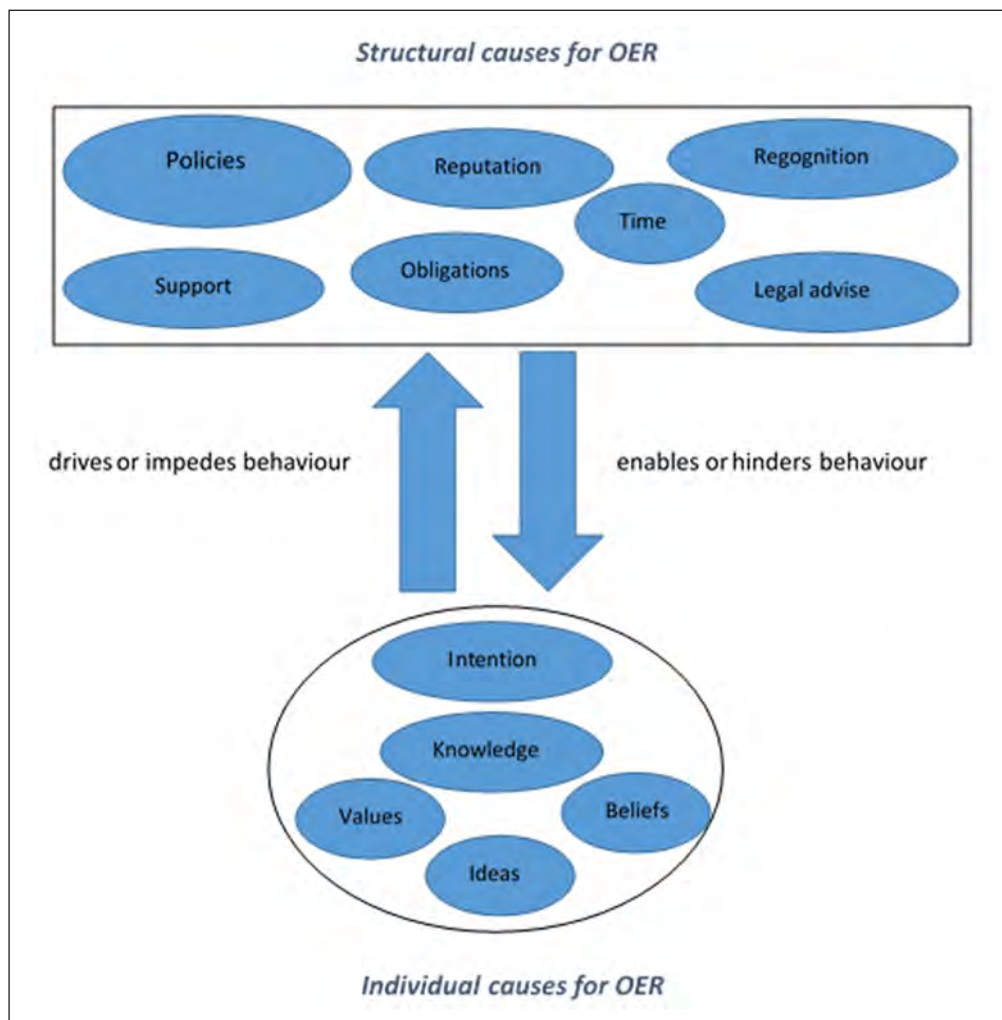
To develop an actor-centred perspective, it appears suitable to draw on social psychological approaches as these examine individual experiences to determine their influence on social behaviour. The underlying psychological construct of attitudes has been considered early on as one of the essential concepts in social psychology (Allport 1935). In the meantime, the concept of attitudes is one of the most widely applied concepts in social science research (Guyer & Fabrigar 2015). This status is primarily due to the concept's claim to be able to establish a relationship between social attitudes and social action (Meinefeld 1977). Notwithstanding the behavioural impact of attitudes, attitudinal research can equally be used to determine the values and beliefs of an individual concerning certain subjects or objects.

In short, attitudes describe a positive or negative evaluation of a person towards an object or event (Eagly & Chaiken 1993). A definition widely accepted in the literature is that attitudes are objects comprising "anything a person may hold in mind, ranging from the mundane to the abstract, including things, people, groups, and ideas" (Bohner & Dickel 2010: 392). While attitudes are often characterised as a simple association with an object evaluation, they are elements of larger sets of complex knowledge structures. The prevalent conceptualisation of attitudes is that they represent a comprehensive evaluation that individuals can access from memory when asked to do so. Attitudes can thus be defined as a type of knowledge structure that is present in memories at the time of an assessment (Guyer & Fabrigar 2015).

With regards to the structure of attitudes, the tripartite theory or the idea of three components of attitudes is dominant in the literature (Fabrigar et al. 2005). The tripartite theory postulates that attitudes consist of three components, which have been verified in empirical studies and could be distinguished from each other. A conceptual approach derived from these findings to examine the attitudes of an individual was developed by Rosenberg and Hovland (1960). It proposes a taxonomy that consists of a cognitive (knowledge and beliefs), an affective (feelings and emotions), and a behavioural (actions and behaviour) component. This frequently used concept of attitudes is called the CAB or ABC concept (Rosenberg & Hovland 1960). However, attitudes can be both explicit and implicit. While explicit attitudes are consciously perceived and thus able to influence behaviour directly, implicit attitudes are unconscious but equally impact behaviour.

The interdependence of attitudes and behaviour is widely recognised in the literature, which means that although knowledge of an individual's attitudes is not causally related (Chaiklin 2011), it can predict behaviour to a certain extent (Veresova & Mala 2016). The literature especially points to the fact that a very high degree of feelings and emotions regarding the object or subject plays a vital role for behaviour (Allen et al. 1992; Avey et al. 2008; Veresova & Mala 2016).

To sum up, we argue that attitudes play a vital role in explaining why individual practitioners use OER. By conducting a theory-driven study, we aim to elicit replicable findings on how attitudes affect the use of OER. The ABC concept enables us to make a systematic evaluation of the attitudes of educational practitioners through a precise analytical lens. Moreover, the ABC concept permits measuring each attitudinal component independently. This distinct measurement is crucial, as the literature suggests that the cognitive, affective and behavioural components do not necessarily coincide (Schwarz & Bohner 2007). By comparing each component within and among individuals or groups, patterns and idiosyncrasies can be disclosed that explain the use of OER.

METHODOLOGICAL APPROACH

Based on the ABC concept, each of the three components of attitudes was operationalised for the empirical study. *Table 1* shows the indicators that were developed to measure the performance of each component in terms of OER.

ATTITUDINAL COMPONENT	INDICATOR FOR MEASUREMENT
Affective component	Feelings and emotions associated with OER (sharing, cooperating and exchanging)
Behavioural component	Experiences with OER or intention to engage in OER practices
Cognitive component	Knowledge and beliefs about OER and their potentials and benefits

Table 1 Operationalisation of the attitudinal components.

The empirical measurement of attitudes can be divided into two basic types (Gawronski et al., 2006);

- direct measurement (Likert scale and semantic differential)
- indirect measurement (affective priming task and the implicit association test)

The widespread assumption that direct measurement reflects conscious attitudes, while indirect measurement reflects unconscious attitudes is not confirmed by research (Gawronski et al. 2006). Despite the methodological underpinning, the selection of the type of measurement has to be guided mainly by pragmatic research grounds. In our case, the decision for using a direct measurement was determined by the boundary conditions of the research subject. Our target-group encompassed educational practitioners from all of the four dominant educational fields in Germany, school, higher education, adult and continuing education, and vocational education. The underlying objective was to inquire of as many educational practitioners as possible. Hence, we used a survey-based approach and designed a questionnaire to yield the participants' attitudes towards OER. The questionnaire contained four sections with a total of 14 question categories, each of which captured one component of attitudes. In order to generate the highest possible response rate, the questionnaire was designed to be as concise and brief as possible without compromising the validation of the findings. Research emphasises the fact that questionnaire length and respondent-friendliness affect the response rate (Dillman et al. 1993; Jepson et al. 2005).

Apart from sociodemographic questions, the questionnaire encompassed 23 questions to be answered either binary (yes or no) or using a Likert scale (1 fully disagree – 5 fully agree). In addition, there was an open question at the end to be answered optionally.

The first five questions were devoted to surveying the participants' feelings and emotions regarding the concepts of sharing, and cooperation (affective component), which are the core underlying values and ideas of OER. The next section asked the participants about their level of knowledge about the concept of OER followed by six questions which evaluated beliefs associated with OER (cognitive components), for instance if participants were convinced that OER enables or facilitates sharing knowledge or innovative teaching or learning. The final section aimed to disclose the actual or intended behaviour regarding OER (behavioural components). This was intended to disclose whether the participants were either already engaged in OER activities or intended to engage in them. Finally, the participants could indicate their opinion on the main challenges for OER for their field of education.

A pre-test for the objectivity, reliability and validity of the survey questions was carried out among the project members of OERinfo (n = 8) and a second pre-test was done with a test group (n = 20). This procedure secured the reliability of the survey questions by comparing the answers respondents provided in the first pre-test with answers of the second pre-test (Grimm 2010).

To distribute the survey among our target group, we used events that were conducted in the framework of the OERinfo project. These measures encompassed OERcamps, conferences, lectures, workshops and training. During these events, we invited practitioners to take part in the survey, which was provided via an online link or a QR code. In addition, the survey was dispersed using the communication channels of OERinfo, for example, Twitter or Newsletters, and the project partners' websites. The circulation of the survey started in February 2019, and responses were incorporated until the end of 2019. For data evaluation and thus the results presented in the following section, IBM SPSS Statistics software was used, which is one of the most popular software options for quantitative data analysis.

RESULTS

The period covered by the survey was eleven months. In total, the link to the survey was clicked on 333 times, resulting in 201 complete and 131 incomplete or partial answers. The data corpus compiled on this basis included 201 full and six partial answers (n = 207).

As a first observation and demonstrated in *Table 2*, most of the participants took part in OER-related events. Only 52 had learned about the survey from other sources (newsletter, partner websites or others). It is likely, however, that they were at least aware of OER, as the invitation text to the survey made explicit reference to OER. Consequently and ex-ante to the following interpretation of the results, it can be stated that the survey is a positive selection of practitioners who are predominantly familiar with OER.

HOW DID YOU LEARN ABOUT THIS SURVEY?		FREQUENCY	PERCENTAGE	VALID PERCENTAGE
Valid	Newsletter	17	8.2	8.5
	OER lectures	33	15.9	16.4
	OER Webinar	7	3.4	3.5
	OER Workshop	49	23.7	24.4
	OERcamp	29	14.0	14.4
	OERinfo Website	16	7.7	8.0
	Partner website	18	8.7	9.0
	Others	11	5.3	5.5
	Overall	201	97.1	100
	Missing	6	2.9	
Overall	207		100.0	

Table 2 Distribution of participants.

In terms of the educational sector, as revealed in *Table 3*, most of the participants stem from higher education (n = 114), followed by further-/continuing education (n = 44), school (n = 31) with only a few from vocational education (n = 13). The low numbers for school are surprising, as the literature suggests that OER is well established in schools (Deutscher Bildungsserver 2016; Richter & Ehlers 2012). However, the numbers are in line with the low distribution of OER in the two other sectors.

TO WHICH FIELD OF EDUCATION DO YOU BELONG?		FREQUENCY	PERCENTAGE	VALID PERCENT
Valid	School	31	15.0	15.3
	Higher education	114	55.1	56.4
	Vocational education	13	6.3	6.4
	Further-/Continuing education	44	21.3	21.8
	Overall	202	97.6	100.0
Missing		5	2.4	
Overall		207	100	

Table 3 Field of education.

For the behavioural component of our attitudinal concept, it was essential to inquire whether the participants had already used OER or have the intention to do so. Therefore, we asked whether they have already used, published, or revised OER or intend to do so.

Regarding the use of OER, 102 (49.3%) of the participants have already used OER while 64 (30.9%) have published, and 58 (28%) have revised them. Participants who engaged in the use of OER are among those who have already published and revised OER. Thus, a first engagement in the use of OER appears to entail further activities. Overall, over half of the participants are actively engaged in OER activities. However, as already indicated in *Table 2*, many participants attended OERcamps or OER workshops that primarily target OER beginners. Hence, participants who attend these occasions receive basic training to engage in the use of OER. This is visible in the intention of 64 of the participants of the survey to use OER in future events. Only 23 of all participants stated they have no intention of using OER. Moreover, 87 participants expressed an intention to publish OER; 40 of them are already using OER while 31 have no experience. Similar results can be found regarding plans to revise OER from others.

Against this background of 166 (82%) of the participants, who indicated intention or behaviour regarding OER, the behavioural component of attitudes could be rated as high. This constitutes a profound basis for determining the influence of the cognitive and affective components of attitudes on intention and behaviour.

For disclosing the affective components of the participants, as shown in *Table 4*, we inquired the participants' feelings and emotions regarding the core underlying ideas and values of OER. Without explicitly mentioning OER, we asked about their agreement with general statements about the idea of sharing, exchanging, and collaboration. The high agreement with all of the statements underscores their importance for the participants. Especially the emotional aspect is evident in the high approval for the pleasure that participants feel when other people use their material (4.19). The statement about the importance of exchanging and cooperating with colleagues receives the second-highest approval (4.66), only outscored by sharing as a possibility to receive feedback (4.68).

Table 4 Feeling and emotions regarding sharing, exchanging and cooperation (affective component).

TO WHAT EXTENT DO YOU AGREE WITH THE FOLLOWING STATEMENTS? (1–5)		[I CONSIDER THE EXCHANGE AND COOPERATION WITH COLLEAGUES TO BE IMPORTANT.]	[SHARING HELPS ME GET FEEDBACK FROM OTHERS.]	[IT GIVES ME PLEASURE WHEN OTHERS USE MY MATERIALS.]	[SHARING MY MATERIALS, HELPS SPREAD MY IDEAS.]	[SHARING IS A KEY] COMPONENT OF EDUCATION.]
N	Valid	205	205	203	202	204
	Missing	2	2	4	5	3
Mean		4.66	4.68	4.19	4.24	4.03
Median		5.00	5.00	5.00	4.00	4.00
Std.-deviation		.739	.715	.879	.888	.959

The next section of the survey was dedicated to measuring the cognitive component of the participants' attitudes. This comprised their knowledge and beliefs about OER. Therefore, the related questions and statements explicitly mentioned OER. As *Table 5* illustrates, the level of knowledge about OER stated by the participants is rather moderate (3.78). 33.9% of the participants indicated a moderate level of knowledge; 28.6% stated it to be high. These moderate numbers can be explained by the fact that knowledge about OER is supposed to be higher in expert circles and rather low at OER workshops and camps because many OER beginners attend them. However, only 6.3% stated not knowing about OER, which further underscores the assumption that only those familiar with OER took part in the survey.

Table 5 OER knowledge (cognitive component).

HOW DO YOU ASSESS YOUR KNOWLEDGE OF OER?		
(1 NO KNOWLEDGE – 6 VERY HIGH)		
N	Valid	189
	Missing	18
Mean		3.78
Median		4.00
Std.-Deviation		1.280

In the next section and shown in *Table 6*, the participants had to indicate their agreement with the frequently postulated benefits of using OER, which we derived from the broader discussion in the OER literature (Delgado et al. 2019; Otto 2019; Pawlowski & Bick 2012; Wiley & Hilton 2018). While the results demonstrate a high level of agreement with all of the benefits, it is noteworthy that abstract concepts such as sharing (4.29) and exchange (4.25) are exceptionally high. In contrast, agreement decreases slightly when concrete benefits are mentioned, such as legal certainty (3.76). These findings are in line with other surveys that reveal that engagement with OER requires increased time and effort for course preparation (de los Arcos et al. 2014; Farrow et al. 2015).

To sum up, for the cognitive component, we can state a discrepancy between a moderate level of knowledge and strong beliefs. We conducted a correlation analysis to disclose their interrelatedness. As indicated in *Table 7*, our analysis of a statistical relationship using Spearman-Rho revealed no clear significant correlation. A correlation can only be observed for the more abstract values like sharing and knowledge exchange. This indicates the hypothesis that knowledge about OER is not a significant cause for positive beliefs about OER.

TO WHAT EXTENT DO YOU AGREE WITH THE FOLLOWING STATEMENTS? (1–5)	N		MEAN	MEDIAN	STD. DEVIATION
	VALID	MISSING			
[OER enable a culture of sharing.]	198	9	4.29	4.00	.839
[OER facilitate the exchange of knowledge.]	197	10	4.25	4.00	.873
[OER support innovative teaching and learning.]	197	10	3.93	4.00	.953
[OER facilitate the preparation of one's own teaching.]	196	11	3.93	4.00	.984
[OER facilitate the updating of material.]	198	9	3.96	4.00	.934
[OER enable the legally compliant use of material.]	197	10	3.76	4.00	.985

Table 6 OER benefits (cognitive component).

			[HOW DO YOU ASSESS YOUR KNOWLEDGE OF OER?]
Spearman's rho	[How do you assess your knowledge of OER?]	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	189
	[OER enable a culture of sharing.]	Correlation Coefficient	.244**
		Sig. (2-tailed)	.001
		N	186
	[OER facilitate the exchange of knowledge.]	Correlation Coefficient	.209**
		Sig. (2-tailed)	.004
		N	185
	[OER support innovative teaching and learning.]	Correlation Coefficient	.070
		Sig. (2-tailed)	.342
		N	186
	[OER facilitate the preparation of one's own teaching.]	Correlation Coefficient	.105
		Sig. (2-tailed)	.157
		N	184
	[OER facilitate the updating of material.]	Correlation Coefficient	.126
		Sig. (2-tailed)	.086
		N	186
	[OER enable the legally compliant use of material.]	Correlation Coefficient	.094
		Sig. (2-tailed)	.204
		N	185

Table 7 Correlation between OER knowledge and benefits.

** Correlation is significant at the 0.01 level (2-tailed).

In the next step, we examined the effects of the level of knowledge about OER on the participants' use of OER. As illustrated in *Table 8*, the chi-square test reveals that neither variable is independent of the other. The use of OER is related to the participants' level of knowledge about OER. Via the chi-square test, we identified similar results for participants who have already published or revised OER.

CHI-SQUARE TESTS			
	VALUE	df	ASYMPTOTIC SIGNIFICANCE (2-SIDED)
Pearson Chi-Square	40.027[a]	5	.000
Likelihood Ratio	45.402	5	.000
Linear-by-Linear Association	37.837	1	.000
N of Valid Cases	154		

Table 8 Correlation between knowledge of OER and having published OER.

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 3.58.

Notably, as shown in *Table 9*, we disclosed no such correlation for knowledge and the intention to use, publish, or revise OER.

CHI-SQUARE TESTS			
	VALUE	df	ASYMPTOTIC SIGNIFICANCE (2-SIDED)
Pearson Chi-Square	6.411ᵃ	4	.171
Likelihood Ratio	6.421	4	.170
Linear-by-Linear Association	.496	1	.481
N of Valid Cases	84		

When these results are merged with our previous findings, they indicate that beliefs about OER are mainly independent of the knowledge about it. Knowledge about OER, however, is a least interrelated with its use.

When lastly, we asked the participants about the main challenges for OER (*Table 10*), no issue was predominant. More than half of the participants indicated none of the barriers identified in the literature (Bozkurt et al. 2019; Percy & Van Belle 2012). In particular the lack of acceptance, and the legal uncertainties, which are often mentioned in the literature (Kursun et al. 2014) do not constitute a significant challenge for the participants, which underlines their strong beliefs about OER and the corresponding values.

WHAT ARE THE CHALLENGES YOU SEE FOR OER IN YOUR FIELD OF EDUCATION?						
		LACK OF TIME	LEGAL UNCERTAINTY	TECHNICAL BARRIERS	SEARCH FOR MATERIAL	LACK OF ACCEPTANCE
N	Valid	207	207	207	207	207
	Missing	25	22	29	29	29
	Yes	112 (54.1%)	104 (50.2%)	76 (36.7%)	88 (43%)	74 (35.7%)

Table 10 Challenges for OER.

IMPLICATIONS AND LIMITATIONS OF THE STUDY

In this article, we applied a systematic and theoretically driven approach to explain why individual educational practitioners show intention and behaviour regarding the use of OER. Based on the ABC-concept of attitudes, we designed a survey and distributed it across all educational sectors to investigate the determining components.

Concisely, as demonstrated in *Table 11*, a positive attitude towards OER is evident for each of the three attitudinal components among the participants.

ATTITUDES	MEASUREMENT REGARDING OER	APPROVAL
Behavioural component	Over two-thirds indicate intention or behaviour	High
Cognitive component	Moderate knowledge and strong beliefs about OER	Moderate to High
Affective component	Strong feelings and emotions for underlying ideas and values	Very High

Table 11 Components of attitudes regarding OER.

The behavioural component indicates that the survey participants are a positive selection who expressed firm intention and behaviour regarding OER. In total, 166 of the 207 participants either use (102) or intend (64) to use OER.

For the cognitive and affective component, it is remarkable that the affective rather than the cognitive component seems to be the crucial factor for the participants to engage in OER. The research literature about attitudes backs these findings as it considers high levels in the affective component to prelude behaviour (Rosenberg & Hovland 1960; Shrigley 1990). We can confirm this for the case of OER. It is thus reasonable to conclude that the predominant factors as to why individual practitioners engage in OER are their positive feelings and emotions for the underlying ideas and values of OER. These feelings and emotions strengthen the participants' beliefs in OER as a manifestation that represent these ideas and values. This assumption is reinforced by the

fact that the knowledge about OER among the participants is relatively moderate. Therefore, the beliefs about OER are mostly independent of the level of knowledge about OER. However, the level of knowledge is determined by whether educational practitioners have already used OER. Bringing these findings together, this implies that practitioners are mainly attracted by the underlying value and ideas of OER, but need to acquire a certain level of knowledge to use them.

While our results mentioned above were obtained on solid methodological grounds, they nevertheless face some limitations that need to be addressed. One central point is that we surveyed individuals, who are generally interested in learning about OER and therefore attended the events. The results might have been different if we had surveyed those who were unaware or not interested in the topic.

The operationalisation of the different components of attitudes for the survey is relatively simple and could have been further distinguished. Central values such as sharing, for example, probably have a much more wide-ranging understanding among OER users. OER related values are presumably linked to other socio-political issues that go beyond the traditional understanding of educational institutions and their efficiency-based principles. Concerning the validation of the high values for the affective component, a control group would have been desirable. However, a shortage in operationalising the indicators had to be balanced and decided against an expected increase in response rate.

Lastly, regarding the behavioural component, with our methodology, we were only able to render self-reported intention or behaviour. Hence, there is no hard evidence to verify the participants' statements in the survey. In addition, the response rate to the survey was relatively low. This is remarkable as the survey, apart from OER occasions, was distributed in several relevant newsletters and on websites for all educational sectors that were not directly related to OER. However, against the background of the current results in the literature (Deimann et al. 2015; Orr et al. 2017; Otto 2019; Surmann & Echterhoff 2018), our results reaffirm that the adoption of OER in Germany outside of a very committed circle is limited.

OUTLOOK

To sum up, the results of our study demonstrate that attitudes are a crucial concept that can explain OER engagement. Strong feelings and emotions mainly drive educational practitioners to join OER related events and explore OER as a manifestation of their favoured ideas and values. Consequently, the frequent call for a removal of structural barriers in educational institutions whilst important would not be sufficient to increase the adoption of OER. Not surprisingly, the results reveal that primarily the affective component is a predictor to engage with OER. In the next step, the practical use of OER appears to be influenced by the level of knowledge about them.

Against this background, we would suggest that ex-ante to imparting knowledge and training about OER, the general concepts of sharing, exchange and cooperation need to be entrenched in educational institutions as guiding principles for teaching and learning. Subsequently, the implementation of concrete measures in institutions, for instance, permanent training programmes, legal advice, and additional time would be consistent. As shown in *Figure 1*, improving structural conditions can encourage those with positive attitudes towards OER and vice versa. However, individual and structural measures do not have to be mutually exclusive but could be pursued concomitantly.

For future research, it would be crucial to replicate our study and thereby solidify or further expand and differentiate our findings. Thereby similarities or inconsistencies that occur regarding attitudes in other countries or across educational sectors could be disclosed.

ADDITIONAL FILES

The additional files for this article can be found as follows:

- **File 1.** Dataset Codes. DOI: *https://doi.org/10.5334/jime.606.s1*
- **File 2.** Dataset including written variables. DOI: *https://doi.org/10.5334/jime.606.s2*
- **File 3.** Dataset Codes for SPSS Statistics. DOI: *https://doi.org/10.5334/jime.606.s3*

ACKNOWLEDGEMENTS

COMPETING INTERESTS

The author has no competing interests to declare.

AUTHOR AFFILIATION

Daniel Otto [ID] *orcid.org/0000-0002-8226-4741*
Learning Lab, University of Duisburg-Essen, DE

REFERENCES

Allen, CT, Machleit, KA and **Kleine, SS.** 1992. A comparison of attitudes and emotions as predictors of behavior at diverse levels of behavioral experience. *Journal of Consumer Research*, 18(4): 493–504. DOI: *https://doi.org/10.1086/209276*

Allport, G. 1935. Attitudes. In: Murchison, C and Worcester, M (eds.), *Handbook of social psychology*. Clark University Press. pp. 789–844.

Avey, JB, Wernsing, TS and **Luthans, F.** 2008. Can positive employees help positive organizational change? Impact of psychological capital and emotions on relevant attitudes and behaviors. *The Journal of Applied Behavioral Science*, 44(1): 48–70. DOI: *https://doi.org/10.1177/0021886307311470*

Bayne, S, Knox, J and **Ross, J.** 2015. Open education: The need for a critical approach. *Learning, Media and Technology*, 40(3): 247–250. DOI: *https://doi.org/10.1080/17439884.2015.1065272*

Bohner, G and **Dickel, N.** 2010. Attitudes and attitude change. *Annual Review of Psychology*, 62(1): 391–417. DOI: *https://doi.org/10.1146/annurev.psych.121208.131609*

Bozkurt, A, Koseoglu, S and **Singh, L.** 2019. An analysis of peer reviewed publications on openness in education in half a century: Trends and patterns in the open hemisphere. *Australasian Journal of Educational Technology*, 35(4): 68–97. DOI: *https://doi.org/10.14742/ajet.4252*

Chae, B and **Jenkins, M.** 2015. A qualitative investigation of faculty open educational resource usage in the Washington Community and Technical College System: Models for support and implementation. *Washington State Board for Community & Technical Colleges*, January. pp. 1–38. DOI: *https://doi.org/10.1097/00004356-198912000-00008*

Chaiklin, H. 2011. Attitudes, behavior, and social practice. *The Journal of Sociology & Social Welfare*, 38(1): 31–54.

Clements, K, Pawlowski, J and **Manouselis, N.** 2015. Open educational resources repositories literature review – Towards a comprehensive quality approaches framework. *Computers in Human Behavior*, 51: 1098–1106. DOI: *https://doi.org/10.1016/j.chb.2015.03.026*

Cronin, C and **MacLaren, I.** 2018. Conceptualising OEP: A review of theoretical and empirical literature in Open Educational Practices. *Open Praxis*, 10(2): 127–143. DOI: *https://doi.org/10.5944/openpraxis.10.2.825*

De Hart, K, Chetty, Y and **Archer, E.** 2015. Uptake of OER by staff in distance education in South Africa. *The International Review of Research in Open and Distributed Learning*, 16(2): 1–15. DOI: *https://doi.org/10.19173/irrodl.v16i2.2047*

de los Arcos, B, Farrow, R, Perryman, L-A, Pitt, R and **Weller, M.** 2014. *OER evidence report 2013–2014*.

Deimann, M, Neumann, J and **Muuß-Merholz, J.** 2015. *Whitepaper. Open Educational Resources (OER) an Hochschulen in Deutschland – Bestandsaufnahme und Potenziale 2015*.

Delgado, H, Delgado, MS and **Hilton, J.** 2019. On the efficacy of open educational resources: Parametric and nonparametric analyses of a university calculus class. *International Review of Research in Open and Distance Learning*, 20(1): 185–203. DOI: *https://doi.org/10.19173/irrodl.v20i1.3892*

Deutscher Bildungsserver. 2016. *Machbarkeitsstudie zum Aufbau und Betrieb von OER-Infrastrukturen in der Bildung*. *https://www.pedocs.de/volltexte/2016/11715/pdf/OER_Machbarkeitsstudie_Bericht.pdf*.

Dillman, DA, Sinclair, MD and **Clark, JR.** 1993. Effects of questionnaire length, respondent-friendly design, and a difficult question on response rates for occupant-addressed census mail surveys. *The Public Opinion Quarterly*, 57(3): 289–304. DOI: *https://doi.org/10.1086/269376*

Eagly, AH and **Chaiken, S.** 1993. The psychology of attitudes. In: *The psychology of attitudes*. Harcourt Brace Jovanovich College Publishers. DOI: *https://doi.org/10.1103/PhysRevB.80.115331*

Ehlers, U-D. 2011. Extending the territory: From open educational resources to open educational practices. *Journal of Open, Flexible and Distance Learning*, 15(2): 1–10.

Fabrigar, LR, MacDonald, TK and **Wegener, DT.** 2005. The matrix of attitude-relevant influences. In: *The handbook of attitudes* (Issue April). Routledge Handbooks Online. DOI: *https://doi. org/10.4324/9781410612823.ch3*

Farrow, R, Pitt, R, De Los Arcos, B, Perryman, LA, Weller, M and **McAndrew, P.** 2015. Impact of OER use on teaching and learning: Data from OER research hub (2013–2014). *British Journal of Educational Technology*, 46(5): 972–976. DOI: *https://doi.org/10.1111/bjet.12310*

Gawronski, B, Hofmann, W and **Wilbur, CJ.** 2006. Are "implicit" attitudes unconscious? *Consciousness and Cognition*, 15(3): 485–499. DOI: *https://doi.org/10.1016/j.concog.2005.11.007*

Green, AG. 2017. What is open pedagogy? *Year of Open*. DOI: *https://doi.org/10.13140/ RG.2.2.27026.86726*

Grimm, P. 2010. Pretesting a questionnaire. In: *Wiley International Encyclopedia of Marketing*. John Wiley & Sons, Ltd. DOI: *https://doi.org/10.1002/9781444316568.wiem02051*

Guo, Y, Zhang, M, Bonk, CJ and **Li, Y.** 2015. Chinese faculty members' Open Educational Resources (OER) usage status and the barriers to OER development and usage. *International Journal of Emerging Technologies in Learning*, 10(5): 59–65. DOI: *https://doi.org/10.3991/ijet.v10i5.4819*

Guyer, JJ and **Fabrigar, LR.** 2015. Attitudes and behavior. In: *International encyclopedia of the social & behavioral sciences*. Second edition. pp. 183–189. DOI: *https://doi.org/10.1016/B978-0-08-097086- 8.24007-5*

Hegarty, B. 2015. Attributes of open pedagogy: A model for using open educational resources. *Educational Technology*, 4(July– August): 3–13. DOI: *https://doi.org/10.1016/j.calphad.2007.10.001*

Hogg, M and **Vaughan, G.** 2005. *Social psychology*. Prentice-Hall.

Jepson, C, Asch, DA, Hershey, JC and **Ubel, PA.** 2005. In a mailed physician survey, questionnaire length had a threshold effect on response rate. *Journal of Clinical Epidemiology*, 58(1): 103–105. DOI: *https://doi.org/10.1016/j.jclinepi.2004.06.004*

Jurado, RG and **Pettersson, T.** 2015. Attitudes and utilization of open educational resources. *ICERI2015 Proceedings*. pp. 6317–6323.

Kanwar, A and **Uvalić-Trumbić, S.** 2011. A basic guide to open educational resources (OER). In: *UNESCO and Commonwealth of Learning*. Commonwealth of Learning. DOI: *https://doi.org/10.1111/j.1467- 8535.2012.01378.x*

Kelly, H. 2014. A path analysis of educator perceptions of open educational resources using the technology acceptance model. *International Review of Research in Open and Distance Learning*, 15(2): 26–42. DOI: *https://doi.org/10.19173/irrodl.v15i2.1715*

Kerres, M and **Heinen, R.** 2015. Open informational ecosystems: The missing link for sharing educational resources. *International Review of Research in Open and Distance Learning*, 16(1): 24–39. DOI: *https://doi.org/10.19173/irrodl.v16i1.2008*

Knox, J. 2013. The limitations of access alone: Moving towards open processes in education technology. *Open Praxis; Vol 5, No 1 (2013): Openness in Higher Education*. DOI: *https://doi.org/10.5944/ openpraxis.5.1.36*

Koseoglu, S and **Bozkurt, A.** 2018. An exploratory literature review on open educational practices. *Distance Education*, 39(4): 441–461. DOI: *https://doi.org/10.1080/01587919.2018.1520042*

Kursun, E, Cagiltay, K and **Can, G.** 2014. An investigation of faculty perspectives on barriers, incentives, and benefits of the OER movement in Turkey. *The International Review of Research in Open and Distributed Learning*, *15*(6 SE-Research Articles). DOI: *https://doi.org/10.19173/irrodl.v15i6.1914*

Meinefeld, W. 1977. Einstellung und soziales handeln. In: *rororo-Studium: Sozialwissenschaft*. Rowohlt.

Mishra, S. 2017. Open educational resources: Removing barriers from within. *Distance Education*, 38(3): 369–380. DOI: *https://doi.org/10.1080/01587919.2017.1369350*

Orr, D, Neumann, J and **Muuß-Merholz, J.** 2017. *German OER practices and policy — from bottom-up to top-down initiatives*.

Otto, D. 2019. Adoption and diffusion of Open Educational Resources (OER) in education. *The International Review of Research in Open and Distributed Learning*, 20(5 SE-Research Articles): 122–140. DOI: *https://doi.org/10.19173/irrodl.v20i5.4472*

Pawlowski, JM and **Bick, M.** 2012. Open educational resources. *Business and Information Systems Engineering*, 4(4): 209–212. DOI: *https://doi.org/10.1080/15228959.2015.1095671*

Percy, T and **Van Belle, JP.** 2012. Exploring the barriers and enablers to the use of open educational resources by university academics in Africa. In: Hammouda, I, Lundell, B, Mikkonen, T and Scacchi, W (eds.), *IFIP Advances in Information and Communication Technology: Vol. 378 AICT*. Berlin, Heidelberg: Springer. pp. 112–128. DOI: *https://doi.org/10.1007/978-3-642-33442-9_8*

Richter, T and **Ehlers, UD.** 2012. Barriers and motivators for using open educational resources in schools. *Open Ed 2010: The Seventh Annual Open Education Conference, 2010*. pp. 413–424. *http:// openaccess.uoc.edu/webapps/o2/bitstream/10609/4868/6/Richter_editat2.pdf.*

Rosenberg, MJ and **Hovland, CI.** 1960. Cognitive, affective, and behavioral components of attitudes. In: Rosenberg, MJ and Hovland, CI (eds.), *Attitude organization and change: An analysis of consistency among attitude components: Vol. Yale studies in attitude and communication*. Yale University Press. pp. 1–14.

Santos-Hermosa, G, Ferran-Ferrer, N and **Abadal, E.** 2017. Repositories of open educational resources: An assessment of reuse and educational aspects. *International Review of Research in Open and Distance Learning*, 18(5): 84–120. DOI: *https://doi.org/10.19173/irrodl.v18i5.3063*

Schuwer, R and **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. *International Review of Research in Open and Distance Learning*, 19(3): 1151–1171. DOI: *https://doi.org/10.19173/irrodl.v19i3.3390*

Schwarz, N and **Bohner, G.** 2007. The construction of attitudes. In: *Blackwell handbook of social psychology: Intraindividual processes*. Blackwell Publishers Inc. pp. 436–457. DOI: *https://doi.org/10.1002/9780470998519.ch20*

Shrigley, RL. 1990. Attitude and behaviour are correlates. *Journal of Research in Science Teaching*, 27(2): 97–113. DOI: *https://doi.org/10.1002/tea.3660270203*

Surmann, C and **Echterhoff, C.** 2018. OERinfo – die richtlinie zur förderung von offenen bildungsmaterialien. In: Projekte der BMBF-Förderung OERinfo 2017/2018. *Projekte Der BMBF-Förderung OERinfo 2017/2018. Sonderband Zum Fachmagazin Synergie*. pp. 10–17.

UNESCO. 2002. *Forum on the impact of open courseware for higher education in developing countries final report UNESCO*.

UNESCO. 2019. *Draft recommendation on open educational resources*. UNESCO. General Conference, 40th, 2019; UNESCO. *https://unesdoc.unesco.org/ark:/48223/pf0000370936*.

UNESCO IITE. 2019 *Understanding the impact of OER: Achievements and challenges*. *https://iite.unesco.org/publications/understanding-the-impact-of-oer-achievements-and-challenges/*.

Veresova, M and **Mala, D.** 2016. *Attitude toward school and learning and academic achievement of adolescents*. 870–876. DOI: *https://doi.org/10.15405/epsbs.2016.11.90*

Weede, E. 1992. *Mensch und gesellschaft: Soziologie aus der perspektive des methodologischen individualismus*. Mohr Siebeck Gmbh & Co. K.

Wiley, DA. 2020. Open educational resources: Undertheorized research and untapped potential. *Educational Technology Research and Development*. DOI: *https://doi.org/10.1007/s11423-020-09907-w*

Wiley, DA and **Hilton, J.** 2018. Defining OER-enabled pedagogy. *International Review of Research in Open and Distance Learning*, 19(4): 133–147. DOI: *https://doi.org/10.19173/irrodl.v19i4.3601*