Operationalisation of Higher Education Teaching Performance (HETP) recognising and rewarding teaching as a part of science is enabled by Open Scholarship

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4. Quantitative operationalisation of open HETP: OER Statistics

The development of the quantitative operationalisation of HETP emerges from a three-stage process. The first stage is a study in which the main idea of scientometric indicators that capture open teaching material was discussed with the open scholarship and scientometrics community in the form of focus groups (chapter 4.1). The results of the study were presented and discussed at the ISSI 2023 conference in Bloomington, USA (Weimer & Kullmann 2023). The second stage involved a concept evaluation, which was conducted in the form of expert interviews (chapter 4.2). The results of the study are published in the journal Scientometrics (Weimer & Kullmann 2024). The resulting framework sets out the quantitative operationalisation of open HETP (chapter 4.3) and is published in the journal *Information – Wissenschaft & Praxis (IWP)* (Weimer & Kullmann 2025). As with the previous chapters, the text is taken verbatim from published treatises. Changes were only made to ensure readability within the overall concept of this thesis.

4.1. Pre-study of OER Statistics

The pre-study of OER Statistics development aims to discuss the question of whether the scientific community in the field of scientometrics and open scholarship considers the operationalisation of HETP in the form of quantification of OER to be useful and desirable. The two research questions are as follows:

(1) How do experts in OER and/or scientometrics assess scientometric indicators for OER as a tool to make higher education teaching efforts more visible?
(2) What potential effects and impacts could OER indicators imply?

In the following, I present the results of the focus group discussion in which these questions were explored.

4.1.1. Method and the first version of the OER Statistics

We organized three focus group discussions between May and July 2022 with between three and six participants each. There were 13 participants in total. The conversations lasted a maximum of two hours each. The focus group method lends itself to our study because it ensures that different perspectives are heard and mutually enrich each other through interaction among the participants: "The hallmark of focus groups is the explicit use of the group interaction to produce data and insights that would be less accessible without the interaction found in a group" (Morgan 1990, 12). Focus groups provide insight into the range of opinions of the entire group, as the exchange of arguments is analysed and evaluated at the end. The study is not about capturing individual opinions (Merton, Fiske & Kendall 1956).

Our focus groups consisted of researchers with expertise in either scientometric measurement and/or open scholarship respectively OER. Experts were contacted directly by email and asked to participate. We ensured an even distribution in gender and research experience, included female and male participants, and PhD students, post-docs and professors. All participants were working in Germany. The focus group discussions took place online.

Our preparation for the focus groups consisted of a presentation of outlined OER indicators as subject of discussion (Figure 5). The indicators were introduced at the beginning of each focus group (Table 8). In theory, existing open scholarship indicators could be transferred to the subject of OER.

Where classical open scholarship products, e.g. open access publications or open research data are counted, OER could be counted in the area of teaching material. Where the degree of openness of open access publications is recorded using the green, hybrid or golden road labels, the teaching material licenses could determine how open the materials are. Traditional bibliometric and altmetric indicators can also be applied to both open research material and OER. It would thus be possible to record how often an OER was cited, how often it was downloaded, viewed or shared on social media channels.

Open Access Indicators	*OER Indicators*
number	OER count
openness	degree of openness (weak, strong OER)
	granularity of OER (low, medium, high)
citations	citations of OER
downloads	downloads of OER
views	views of OER
bookmarks	bookmarks of OER
social media count	social media conversations about OER
re-use	reuse of OER

Table 8. transfer of OA indicators to OER.

In fact, there are several obstacles to consider because OER which are designed exclusively for teaching/learning purposes differ from scientific publications in many aspects. Some difficulties were briefly touched upon in the presentation and were then taken up and further discussed by the participants. One aspect is the diverse granularity of OER which coincides with different types of OER (e. g. videos, slides, exercises) as well as the degree of openness depending on copyright assigned to a resource by its creator. The discussion was not conducted at the level of individual OER indicators as outlined in table 8 but the overarching research questions were central to the discussions. Apart from the brief presentation of the exemplary OER indicators and the research questions, the focus groups were not structured. There was no guideline. Our intervention was limited to answering explanatory questions as well as inquiries if from our point of view, a clarification of how exactly a contribution was meant was necessary.

The focus groups were then transcribed by external service providers. The transcripts were afterwards analysed in a three-step process according to Bohnsack (2021). The first two steps are carried out in relation to the focus group discussions on their own, only in the third step are the focus group discussions brought together. The first step involved *formulating interpretation* (German: *Formulierende Interpretation*; Bohnsack 2021, 138) of the individual discussions to identify issues raised. The first step was carried out independently by my co-author and me. Inductively, we extracted codes from the text. In the subsequent "reflective interpretation" (German: *Reflektierende Interpretation*; Bohnsack 2021, 139), the codes within the individual transcripts were set in relation to each other by considering the terms in their conversational context. Umbrella concepts were found, and first codebooks emerged for each transcript. Afterwards, the three codebooks were discussed and condensed into a final codebook. In the last step, the *formation of types* (German: *Typenbildung*; Bohnsack 2021, 145), the themes identified with their respective references in the individual conversations are analysed on a metalevel in order to highlight overarching patterns.

Remarkably, the research method of focus group discussion reflects subjective assessments. Our work does not claim to represent the impact and effects of the OER indicators in their completeness. In this sense, the advantage of the method is at the same time its limitation.

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Focus Group Discussion

Project: University teaching as part of Open Scholarship

Open Access Indicators	OER Indicators
number	OER count
openness	degree of openness (weak, strong OER)
	granularity of OER (low, medium, high)
citations	citations of OER
downloads	downloads of OER
Views	views of OER
Bookmarks	bookmarks of OER
social media count	social media conversations about OER

Guiding questions

- How do you assess the use of OER indicators as a tool for making higher education teaching visible?
- What potential effects and consequences do you see in the use of OER indicators?

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Figure 5. first version of the OER Statistics

4.1.2. Results and implications for OER Statistics

4.1.2.1. Opportunities and limitations of the OER Statistics

Basic attitude towards scientometric indicators: The focus group participants shared a fundamental scepticism and criticism of scientometric methods. In particular, the impact factor and the h-index were used as examples of indicators that were often poorly applied or misleading. Overall, qualitative methods were favoured over quantitative assessment approaches (research data (2), line 522 – 523, 2158 – 2160). Participants criticized scientometrics erroneously conclude from quantity to quality (research data (2), line 172 - 177). Furthermore, discussants criticised that simple indicators often prevail over more complex ones because they are cheaper to apply and they can be implemented with fewer obstacles (research data (2), line 1319 - 1326, 2155 – 2158, 1331 - 1341). Both arguments against scientometric methods suggest that the indicators are overestimated regarding their informative value and thus interpretations are misleading and unjustified science policy decisions result. This scepticism is also expressed towards the potential OER indicators. They are discussed in the context of the critique of scientometric methods.

Qualitative evaluation procedures that should be preferred according to the participants (especially peer reviews as a central scientific quality assurance instrument) are very complex (research data (2), line 401 - 407). Future performance evaluation based on comprehensive qualitative assessments of teaching material is therefore classified as being desirable but not practical and very unlikely. Participants refer to the practical relevance and good manageability of scientometric indicators (research data (2), line 938 - 941). Furthermore, a steering function is attributed to them in the current system of science evaluation:

> *… I would like to introduce the indicators first in order to make teaching an equal object in the evaluation (research data (2), line 231 – 232)*

> *… So, from that perspective, to say we suggest an indicator to create a taste for teaching as performance, that can work, as I said, that can work. Because now you suddenly have something you can sort by (research data (2), line 943 – 946)*

The overall range of appreciation regarding OER indicators stretches from outright rejection (research data (2), line 2192 - 2199) to a fundamentally positive attitude (research data (2), line 231 - 237). The following contribution illustrates the two opposing positions very well:

> *… Oh, no more indicators. That was my first thought […] I also have the impression that quantity is more important than quality in the scientific field and I would simply be afraid or worried that this would lead to an intensification. On the other hand, I can also imagine that this, yes, somehow/it is about making the use of OER in teaching visible and about practicing openness in university teaching. And what is also an impression I have is that in any procedures, we have just talked about applications, or Ms. Weimer mentioned the classic appointment procedure for professorships, that this quantity is valued even more, that is, more attention is paid to paper publishing, external funding and so on, than to what is actually done in teaching. So far, less attention is actually paid to the aspects of teaching. And for this, it could perhaps be a good means of bringing teaching back to the fore in such procedures, if it is somehow framed in the area of openness. I think that would be good (research data (2), line 2167 – 2180)*

Measurement targets: All participants agreed on the need for greater visibility of higher education teaching, which is one goal of OER indicators. It seemed to be undisputed that this visibility of higher education teaching is currently only visible to a small extent and should be expanded (research data (2), line 638 – 643, 2177 - 2184). The fundamental suitability of OER as a tool for making teaching

visible as a measurement goal of an OER indicator was assessed differently. Positive voices saw OER as a suitable medium for this purpose (research data (2), line 726 - 727):

> *… OER is about accessibility, making things visible. […] That means we shouldn't talk about quality or see that as another dimension, but we should talk about what it means to make visible here. And I believe that the way open access makes science visible, also for a community and others, although I prefer the word accessibility […] also how I think about OER (research data (2), line 687 – 693)*

At the same time, however, there were also negative assessments. The relationship between the measured object of OER as open teaching material and the respective teaching actually carried out was rated as unclear (research data (2), line 624 - 640). Overall, OER were consistently seen as only a part of teaching and not as representative of teaching as a whole (research data (2), line 84 - 90, 533 - 547, 722 - 724).

> *… But that means the OER is the resource […] the material. Not the teaching. (research data (2), line 845)*

> *… OER is, so to speak, I would say, an add-on to good teaching. But it does not stand for good teaching. Good teaching is characterized by the fact that educational processes are initiated but not by the fact that OER are created. So, I would make a big distinction there. For me, OER would be an add-on (research data (2), line 1991 – 1995)*

Furthermore, the openness of teaching/learning material OER was seen as problematic. Teachers for whom OER are not a suitable type of material for personal reasons or due to the characteristics of the subject being taught could be disadvantaged in an OER-based indicator system and thus remain invisible.

> *… And if my subject, which has already been mentioned several times, is a subject in which OER do not play any role and in which I cannot integrate OER in a meaningful way, for whatever reason, or really only very selectively, then it is somehow no longer comparable with a subject where I can run it in a continuous loop, so to speak, both are very, yes, I am exaggerating. And if I'm a person who simply doesn't like dealing with OER, and I can perhaps use other methods to convey the content much more authentically, then OER won't help me. (research data (2), line 512 – 519)*

In summary, participants in the focus groups see OER as a part of teaching as a larger whole. From all the contributions to the discussion together, no clear opinion can be derived as to whether OER and an OER indicator are suitable for raising visibility of higher education teaching.

Measurement results: As could be expected, the measurement results of an OER indicator and its significance were also critically assessed against the background of the basic attitudes towards scientometric indicators. In particular, the question of the meaning and significance of OER indicators was raised (research data (2), line 258 - 268, 342 - 349). The first difficulty addressed in this context was the relationship between the measurement carried out and the actual measurement objective.

> *… the question is what you have measured - what you want to assess and represent somewhere? So, do you actually have this reference, does it actually represent it correctly? And that, I think, is always the difficulty, where you have to be clear about what you want to measure and whether it is represented by data, or where there are weaknesses in the data, where there are distortions. I think that is always the very difficult point when it comes to quantitative evaluations (research data (2), line 1152 – 1158)*

The measurement of individual performance via an OER indicator was consistently viewed critically. Measurements at the level of institutions, on the other hand, were viewed much more positively.

The possibility of drawing conclusions about the quality of the teaching practiced through an OER indicator was rejected (research data (2), line 700 - 702) but at the same time an emphasis on the quality aspect was urged (research data (2), line 2397 - 2411). In this context, the possibility that the openness of OER could indirectly improve the quality of teaching was also discussed (research data (2), line 705 – 711).

Measurement object: As already mentioned, the fundamental suitability of OER as a measurement object for making higher education teaching visible was controversial. Furthermore, the particularities of OER as an object of measurement compared to conventional scientometrically measurable products and documents (e.g. articles or books) were addressed from a more technical perspective.

For instance, participants discussed the different forms (research data (2), line 2278 – 2283) and granularities of OER (research data (2), line 32 - 38), which poses a challenge for scientometrics. OER can be very fine –grained (for example, short exercises or small-scale figures) or have a high granularity (for example, OER as entire online courses). Furthermore, OER were assigned rather static or rather dynamic characteristics due to the inherent dynamism of a subject and the associated rapid adaptation of the subject matter, which is related in particular to the characteristics of the teaching subject (research data (2), line 189 – 192). In addition, OER can be seen as finished "high-gloss materials", equivalent to scientific papers, or as unfinished material that can be further processed by the teaching community (research data (2), line 1895 - 1902).

The topic of versioning OER was also considered to be highly relevant for the implementation of OER indicators (research data (2), line 496 - 502). Due to further processing, different versions of OER are created over time to which different people have contributed to varying degrees. It is a great challenge to represent these different types of participation through indicators[2]. To deal scientifically with versioning of OER, the people involved need to be specified including their activities. This and similar information regarding the OER creation process is usually provided but this information is rather inconsistent, which indicates another characteristic of OER as a scientometric measurement object (research data (2), line 1343 - 1353).

Citation of OER was discussed in the focus groups as problematic for various reasons. An overarching theme was a currently non-existent, self-evident practice in the citation of teaching material. Teaching material should be properly referenced in the same way as scientific publications. However, doubts were expressed as to whether this is always the case in daily practice when creating teaching material (research data (2), line 1812 - 1817). Furthermore, participants noted that the OER citations are technically difficult (research data (2), line 16 - 24). OER are cited inconsistently. No generally accepted procedure has yet been established in this regard (research data (2), line 1812 - 1817). There are also various recommendations for classic, scientific citations (e.g. the citation style according to APA or Harvard), but they all follow the same pattern. OER citations, on the other hand, follow different structures depending on whether they are based on classic, scientific citations (author, year, title, place of publication), follow the TULLU rule[3] (title, author, license, link, place of origin) or the creative commons recommendation[4] (title, author, source, licence). It is therefore difficult to automatically process OER citations.

[2] We see similar problems, for example, with work-in-progress papers or the publication of a paper as a preprint and as a print (e. g. research data (2), lines 1910 – 1918).
[3] TULLU rule: https://open-educational-resources.de/oer-tullu-regel/ [retrieved 01/12/2025]
[4] Creative Commons: https://creativecommons.org/use-remix/ [retrieved: 01/12/2025]

Use Cases: The application of OER indicators is discussed in the focus group interviews on three different levels: on the individual level (especially application and appointment procedures), on the institutional level (university or institute evaluations) and in the application as a research method to identify and analyse changes in teaching cultures. In particular, the use of indicators in application and appointment procedures is viewed very critically. Participants point out that quantitative performance evaluations do not reflect the individual high-quality work and are thus problematic in their application (research data (2), line 2142 - 2148).

The application of OER indicators at the institutional level is seen far more positively. Individual contributions are very open to this application:

> *… I actually find this aspect of institutional evaluation and visibility very important. Because if you think about where the digitalization of teaching and learning is heading from a university strategy perspective, there will certainly be a number of universities that decide not to be visible with their research profile, like Heidelberg University or so, but rather say: we want to develop a strong teaching profile, an international teaching profile, an open teaching profile, an open university, permeability, these are important topics. And you can present yourself very well by saying as a university: We support our teachers and perhaps also develop an OER policy where support structures are simply offered with the aim of publishing as many high-quality materials as possible on the national OER portal and then also be able to present this in the appropriate place. So, I would like to emphasize this use case again as important (research data (2), line 149 – 161)*

Furthermore, as a third potential application, people discussed that the OER indicators could be used as a research method. In particular, capturing a change of culture was mentioned as a possible area of application:

> *… I think that your OER indicators don't work if you want to somehow measure individual performance. If you want to measure a cultural change, then maybe an indicator, so to speak, is there a change in a certain discipline, in a certain community? You could use it for that (research data (2), line 2227 - 2231)*

In this case, the OER indicators work less as a means of making university teaching visible and more as a monitoring tool for the adoption of open practices in higher education.

Consideration of disciplinary differences: In addition to the object of measurement itself and the different use cases, the differences between the subject disciplines played a major role in the focus groups. They noted that different subjects relate to different types of teaching material and that these differences in performance evaluations should not disadvantage individual subjects (research data (2), line 49 - 54, 300 - 313). The solution to this problem was also discussed by the focus group: field normalization prevents disadvantages of individual subjects compared to others and is fundamental to subject-specific OER indicator applications and the corresponding fair comparison between disciplines (research data (2), line 189 - 191).

4.1.2.2. OER Statistics effects

In summary, the desirable effects and impacts of OER indicators relate to the equal treatment of higher education teaching and research within the RRS (research data (2), line 231 - 237). This is about enabling academics to gain a reputation and attention for the time and effort they invest in designing teaching materials (research data (2), line 1311 - 1317). This means that one effect of the OER indicators could be the increased visibility and appreciation of teaching activities and thus a reputational gain for teachers. However, this position was not uncontroversial. At the institutional

level, possible positive effects of OER indicators were highlighted in the context of the formation of teaching profiles (analogous to research profiles) of higher education institutions (research data (2), line 751 - 763). As a side effect, the potential effect that the OER indicators act as an incentive structure for the design of OER in higher education teaching was discussed. Openness in teaching would be encouraged and potentially duplication of work would be avoided as people could build on each other's work. At the same time, these desirable effects could turn into negative ones (research data (2), line 568 - 573).

The most often discussed effect is the concern about an intensification of the focus on quantitative aspects in science (research data (2), line 2168 - 2170). There are warnings about the "simplified-counting trap" (research data (2), line 368), which means that simple indicators will be used. In a sense, we do not expect the RRS to improve from the inclusion of OER indicators but merely expanded or shifted. Participants also expected that the non-intended effects of classical scientometric indicators would be transferred to the OER indicators (research data (2), line 2331 - 2339). An explicit mention here concerns strategic publishing of documents in the "smallest publishable unit" (research data (2), line 2152). There is a fear that this trend will be transferred from the research process to the subject of OER.

Furthermore, non-intended effects were also discussed, which only apply to teaching-related practices. In this regard, it is worth mentioning the fear that OER indicators as performance indicators could lead to an efficiency logic that does not make teaching more visible but rather more cost-effective for universities in the long run. On the one hand, basic lectures might no longer be updated but the same teaching materials might be used for years (research data (2), line 563 - 573). And on the other hand, the effect was discussed that teachers who used OER would receive credit for completing fewer courses:

> *… But as soon as you get into these things and measure something like downloads, then all of a sudden, downloads are no longer an indicator for the quality of what you have deposited there, but an indicator that needs to be done elsewhere less, so. If less has to be done in one place, you can imagine what happens to the discussion about teaching loads. Then people say: "How? You are using Open Educational Resources to build your whole course? And now you want me to give you two SWS? Are you out of your mind? I'll give you one." (research data (2), line 590 – 597)*

This means that there is a fear that teachers using OER will have to teach two courses instead of one in the future.

Another teaching-related, non-intended effect could be the elimination of the need for university teaching if OER design led to students being able to gather their teaching materials independently at home, thus making universities and university lecturers obsolete (research data (2), line 599 - 603):

> *… should I really hire someone at my university to knock out everything that is there in terms of teaching? Why should students still visit me?" (research data (2), line 978 - 980)*

In this context, participants saw it as particularly problematic that universities are paid according to their number of students and need students to depend on the university lecturers:

> *… because universities get paid by how many students are enrolled. That is the main source of income. That's what they get paid for. But if I now say that half of my students don't have to be at my university, but can do coursework online, then the university only gets half the money and is broke (research data (2), line 1691 – 1695)*

Finally, the negative effect that teachers who are not comfortable with the design and use of OER are disadvantaged by OER indicators should be mentioned. This is not desirable, as teaching should be authentic and there should be no compulsion to use OER (research data (2), line 526 - 531).

4.1.2.3. Preconditions of the OER Statistics

In the focus group discussions, the potential OER indicators are discussed both on a practical action level and on a structural meta-level. Regarding the latter, the development towards equal visibility of research and teaching is discussed as a cultural change (research data (2), line 2274 - 2275). The prerequisites for this change are seen on a social, an infrastructural and a political level.

The social preconditions are discussed in relation to practices in creating and re-using OER. In this respect, a new attitude would have to emerge that supports and promotes the willingness for open practices (research data (2), line 2368 - 2391). This includes the establishment of a reference culture of OER to counteract the concern that material is illegally reprocessed (research data (2), line 1263 - 1267) but also the emergence of a recognized error culture. The aim is that drawing attention to errors is seen as part of the scientific process and does not have to be prevented at all costs (research data (2), line 1258 – 1263, 2368 – 2391).

Furthermore, technical obstacles were seen for the application of the OER indicators. Certain infrastructural requirements would therefore be necessary such as providing OERs with unique identifiers (e.g. DOIs) (research data (2), line 24 – 31) and marking different versions (research data (2), line 1864 - 1872). In addition, references must be identified as such and the number of citations for an OER must be tracked (research data (2), line 16 - 24). Finally, an infrastructure is desirable that records the reuse or further development of the OER and allows comments or feedback (research data (2), line 2420 - 2424).

There is consensus that political preconditions of OER indicators are needed and that structural change towards a greater visibility of teaching needs to be politically steered (research data (2), line 1677 - 1683).

> *… Visibility is about power and power structures. I can't just say: "Hm, publish more OER, publish open access". It just doesn't work that way. The only thing that helps is pressure, brute force. DFG saying: "Friends, if you want money from us, you have to publish in open access format". That's the only way to break up cultures. To actually break down power structures. And in this respect, if you want to develop OER indicators, develop them for research funding. Because then you have the sledgehammer, so to speak, with which you can smash kneecaps and persuade professional societies to ultimately buckle. Anything else will somehow not work in the long run. And we have experienced it with digital editions that have been mandatory since 2016: Hm, you can do everything, but you have to publish electronically first. And if you then justify well that you want to kill trees to produce books, then you might get money for it. But you publish electronically first. And that worked. And everything else, somehow, with good arguments or, yes, trying to convince people, doesn't work. Because the culture and the power structures are simply too entrenched (research data (2), line 2568 – 2583)*

Allegedly, a "central distribution mechanism" would have to incentivize institutions through the means of OER indicators (research data (2), line 322 - 324) in order to enable structural change. In particular, higher education institutions that do not focus on research could strengthen their teaching profile and focus on this area of activity through OER policies (research data (2), line 753 - 761).

4.1.2.4. Alternatives to the OER Statistics

As already mentioned, scientometric factors were generally viewed critically by the participants in the focus groups, albeit to varying degrees. Several alternatives were listed which according to the discussants are better suited or complementary to quantitative indicators to make higher education teaching more visible.

Peer reviews of teaching material were mentioned as an alternative, i.e. teaching material is reviewed by third parties in the same way as publications. However, this option is considered to be very difficult to implement due to the already high workload in the science sector (research data (2), line 401 – 403).

Procedures were welcomed by which students are given a more significant voice in identifying and publicizing teaching efforts (research data (2), line 2002 - 2004). Teaching evaluations are common at universities at the end of the semester and where students evaluate the courses, they have attended according to various predefined criteria were mentioned here, but these were judged unsuitable and in part rather attested to the character of popularity contests. Suitability for the actual visualization of achievements in the area of higher education teaching was seen less for teaching evaluations (research data (2), line 925 - 935).

Alternatively, open science portfolios were mentioned:

> *... for example, I have a section in my CV that says OER, and I simply list what I have done without writing any figures on it, which I find absolutely legitimate. [...] And at the moment when we don't count, I don't have to list every single course, but I can simply say: "Here, I've put this course online, here and here you can find it, here and here you can look at it". That, I think, is also the important thing about making it visible, that you don't just say I'm doing this, but you can also take a look at my work. (research data (2), line 2611 - 2623)*

These portfolios could present the activities of a person or institution in detail in various scientific fields. In this context, it would be conceivable to add courses and teaching materials to scientists' CVs in analogy to the information about their own scientific project and publication activities (research data (2), line 2288 - 2305).

4.1.3. Summary

In the focus groups, the questions of the suitability of OER and an OER indicators for making HETP visible as well as the expected positive and negative effects of OER indicators were discussed. A clear position shared by all participants on these questions cannot be derived. The results in their complexity can be presented as follows: OER represent a part of teaching but not teaching practice in its entirety. The openness of OER makes them visible and accessible for outsiders. They are thus fundamentally suited to making teaching visible as part of science, in analogy to research.

Qualitative procedures for science evaluation are preferred due to the inadequacies of quantitative procedures, especially with regard to the lack of statements on the quality of work results. Also, scientometric OER indicators cannot make qualitative statements about the underlying resources so scientometrics in performance evaluation should only be seen as an accompanying instrument, never as a stand-alone assessment criterion. Against the background of the resource-related impossibility of proceeding purely qualitatively in the evaluation of scientific achievements, quantitative methods nevertheless have a raison d'être. Particularly in the current situation where quantitative methods are predominant, a set of indicators for OER could contribute to making OER and thus also teaching topical within the framework of science evaluation.

OER measurement is very complex, changeability can always lead to new versions by editing and mixing OER with other resources, raising questions about the appropriate consideration of contributors and the attribution of reputation. Furthermore, there are currently structural obstacles such as a lack of citation practice for teaching/learning materials in general and an infrastructure that is not fully suitable for scientometrics.

With a view to a potential OER indicator set, the significance and importance of the measurement results achieved need to be classified against the background of the measurement objective of making teaching more visible. Regarding the measurement levels, the institutional level is particularly interesting. Here, an OER indicator set could contribute to the development and presentation of teaching profiles for higher education institutions. Furthermore, a cultural change towards open teaching could be visualised via OER indicators. Measurement at the individual level of teachers is viewed critically due to negative experiences from the publication sector.

In developing the potential OER indicator set, the ten principles of the Leiden Manifesto (Hicks et al. 2015) should be considered. Based on the discussions held in the focus groups, these include the demands for support of qualitative methods through scientometric applications (Principle 1), the consideration of discipline-specific subject cultures (Principle 6) as well as the appreciation of individual achievements in addition to scientometrically determined indicators. A transfer of the Leiden Manifesto principles related to the world of scholarly publishing to the world of OER is imperative.

As an alternative to an OER indicator, there are other qualitative options to visualize teaching. At this point, it is necessary to clarify how these can find their way into a science evaluation. Regarding potential OER indicators, it is interesting to see how the two approaches can complement each other in terms of an informed peer review.

The participants in the focus group discussions clearly rejected simplified scientometric indicators for OER like counting without consideration of the special characteristics of the measurement object OER. They argued in line with the position paper of the German Research Foundation (DFG), which rejects the limited use of bibliometric indicators and promotes a more comprehensive science assessment (DFG 2022). Despite comprehensive concerns, however, a balanced set of OER indicators, especially at certain levels of measurement (e.g. at the level of institutions), was considered useful by the focus group members. Likewise, a combination of qualitative and quantitative methods to make teaching visible and appreciated as a separate performance category of science assessment was viewed positively.

From our point of view, the estimation of different effects and impacts of the OER indicators by the focus group participants is justified and enriching. Some criticism, on the other hand, is directed less against the use of scientometric indicators on the subject of OER but rather against the misuse of scientometric indicators in general. These dangers are well known to the scientometric community and are considered in the practice of responsible scientometrics. Against this background, further development and exploration of the idea of an OER indicator set appears worthwhile. The following chapter explains how the OER Statistics were further developed and evaluated in order to enable an appropriate quantification of open HETP and to take the characteristics of OER into account.

4.2. Framework evaluation of OER Statistics

As we saw in the pre-study, the OER Statistics contain potential but also some difficulties and pitfalls. To operationalise HETP appropriately, the first version of the OER Statistics (for version one: chapter

4.1.1) was enriched with the results of the focus group discussions and further developed accordingly (for version two: chapter 4.2.1). This second version of the OER Statistics was evaluated based on expert interviews. This chapter presents this step in the development of OER Statistics. The research question is: *What are appropriate statistics to meaningfully quantify OER, and how do these statistics need to be embedded?* In order to answer this question, I will present the second version of the OER Statistics and the method used to evaluate them. I then present the results of the expert interviews and discuss what this means for the operationalisation of HETP.

4.2.1. Method and the second version of the OER Statistics

The development of the OER Statistics Framework is rooted not only in the results of the pre-study (chapter 4.1.1; Weimer & Kullmann 2023), but also in the examination of OER as a measurement object (Kullmann 2025).

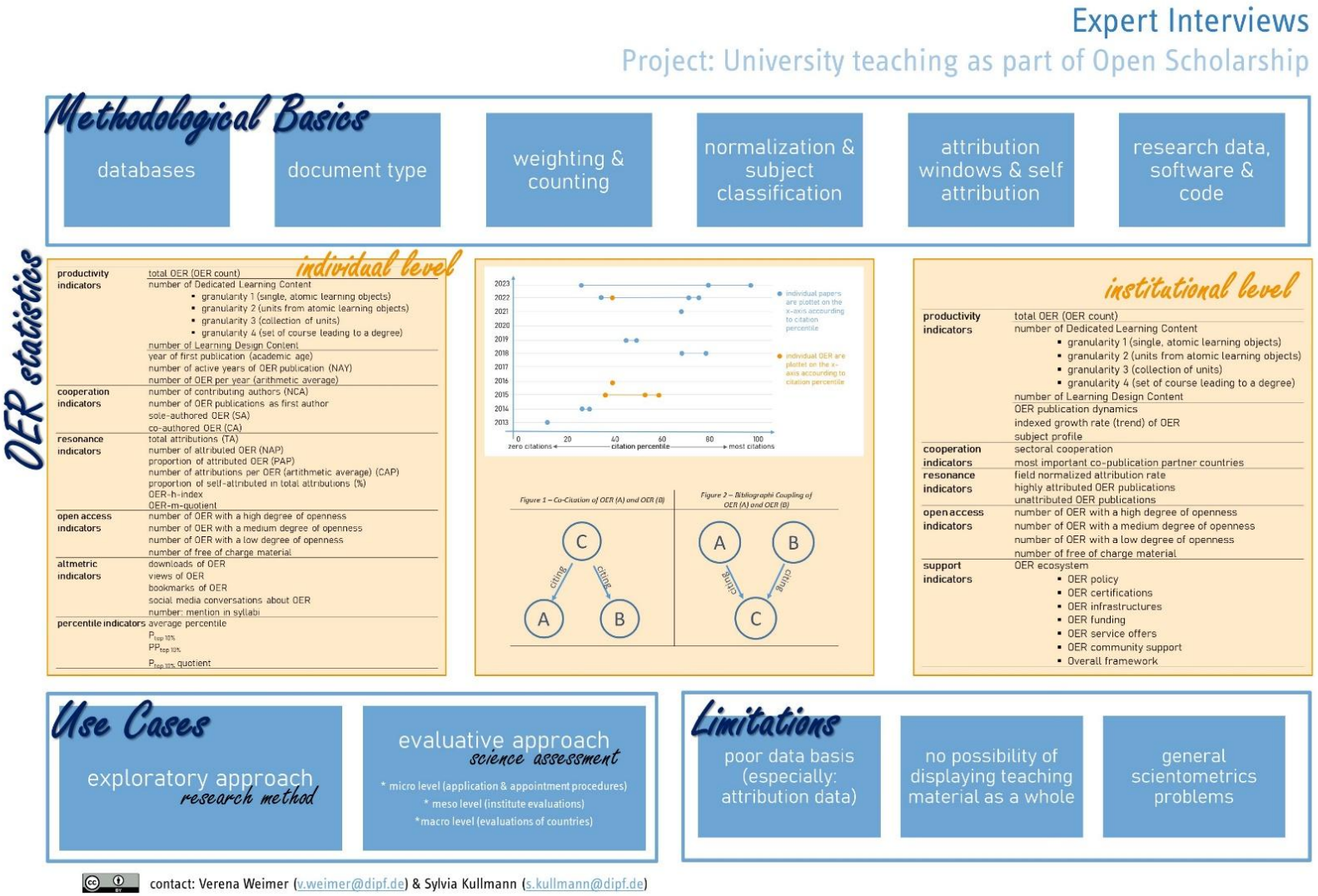
Following the pre-study, we embedded the pure statistics in a context. Figure 6 shows that the second version of the framework of OER Statistics can be divided into four parts. The first part is called “methodological basis”, referring to fundamental scientometric approaches and decisions which always have to be considered in relation to such analyses. Part two is called “OER Statistics” and relates to the actual metrics. Part three is called “use cases” and considers where the OER Statistics can be applied. The last part is called “limitations” and refers to the restrictions of the OER Statistics that should always be considered in the analysis.

(1) The methodological basis of the second version of the framework (part one in Figure 6) is represented by the data basis, the document types which are quantified, weighting procedures to give some artefacts more importance in comparison to others (weighting and counting), subject classification and normalization procedures for comparisons between different disciplines, the dealing with citation windows and self-citations and the necessity to determine the exact way of calculating indicators by naming data and instruments like software and code. When transferred to the world of OER, we adjusted this generally accepted methodological basis which led to a change of terminology. The term “citation” was replaced with “attribution” as the equivalent for CC-licensed artefacts to the reference practice of research publications (Creative Commons 2022).

(2) The framework focusses on the OER Statistics with two different levels of measurement (part two in Figure 6). The individual level enables the representation of the individual achievements in the OER field. It comprises six different indicators and two different categories of measurement objects. The indicators are well known to bibliometric measurements and are adjusted to the specificities of OER: indicators for productivity, cooperation, resonance, openness, altmetrics and percentiles. The adjustment to OER is further illustrated by the use of the two categories “Dedicated Learning Content” and “Learning Design Content” instead of different document types. The summarization into categories instead of focusing on concrete artefact types has the advantage of dealing with the large variety of open teaching/learning materials in a measurable way and at the same time committing to the creation of OER in a way that can be easily recorded. In addition, four levels of granularity are introduced to categorize OER according to their complexity. This approach was adopted from the OER world and it has the advantage of allowing depiction of differences in the complexity of measurement objects without stating values, as it would be the case with weightings. It should also be noted that highly granular, complex OER can lead to counts at all four levels of granularity, provided that the OER allows authors to split the highly granular OER into individual OER with lower levels of granularity. The institutional

level focuses on institutions that engage in open education by supporting the creation, dissemination and reuse of OER. The indicators for productivity, cooperation and resonance at the individual level can also be found here. These indicators can help institutions such as universities present their open education profile. In addition, the new category of support indicators is introduced that deals with supportive activities of institutions and it presents the institution's OER ecosystem. The OER ecosystem as outlined in the OER definition for scientometric purposes (Kullmann 2025) focuses on the existence of an OER policy, OER certifications (VFNM 2022), OER infrastructures like OER repositories, funding for OER projects, services for OER authors and activities to support the OER community.

Figure 6. second version of the OER Statistics



(3) The third part of the OER Statistics Framework concerns the use cases (part three in Figure 6). On the one hand, the OER indicators can be used as a research method in exploratory studies with dedicated research questions. On the other hand, they are suitable for evaluative purposes on an individual and an institutional level.

(4) Limitations are another important area of the OER Statistics Framework draft and round it off (part four in Figure 6). First, the general challenges of scientometric measurements documented in the Leiden Manifesto (Hicks et al. 2015) are mentioned. In addition, the currently poor data basis for OER in general is an important issue. In principle, OER repositories can be used for scientometric analyses. They usually offer an interdisciplinary range of OER in various formats and levels of granularity. However, OER repositories are currently not comparable with research databases such as Web of Science or Scopus. First, OER are not published by all teaching researchers or teachers in higher education but only by relatively few people. Second, OER repositories do not usually provide attribution data. OER repositories usually only contain openly licensed artefacts. Artefacts without an open license that are available and accessible free of charge are not included. Finally, OER are a part of open education but do not represent teaching in its entirety.

Taken together, these four areas (methodological basis; OER Statistics; use cases and limitations) result in the second version of OER Statistics (Figure 6). In addition to the four areas, two visualizations also appear in the second version of the framework. On the one hand, we see a fictional visualization of a scientist's performance based on percentile indicators. This shows the time course between 2013 and 2023 on the y-axis and the percentiles between 0 (0 citations) and 100 (highest number of citations in the period in a specific discipline) on the x-axis. The blue dots indicate the publication of a paper; the orange dots indicate the publication of an OER. The visualisation shows how many publications someone has published and how these publications compare to others in the same discipline in terms of citations. The second visualization shows the theoretical concept of co-citation and bibliographic coupling of OER, it describes the transfer of the well-known concepts from scientometrics.

For the evaluation of the second version of the OER Statistics, we organized six expert interviews with expertise in scientometrics. The interviews took place in September 2023. Two of the interviews were conducted online, the other four were held face to face. The conversations lasted no more than one hour each. For the interviews, we prepared a presentation that shows the second version of the OER Statistics Framework (Figure 6) which was introduced at the beginning. The draft was then discussed in detail with the interviewees; the four areas of the framework being addressed in detail. Our open research data in the form of interview transcripts can be found in research data (3). The evaluation was carried out deductively, following Mayring (2015). The categories used were identical to the four dimensions of the framework, which were "methodological basis", "OER Statistics", "use cases" and "limitations". The analysis focused on critical comments that lead to changes in the framework. The evaluation was carried out in two stages. At first, the interviews were analysed independently by my co-author and me. The results were discussed and summarized in a second step, which focuses on the expert interviews that lead to adjustments to the existing framework.

4.2.2. Results and implications for OER Statistics

The following chapter outlines the critical comments on the second version of the OER Statistics framework. The changes resulting from the experts' input are described in this context.

Methodological basis: During the expert interviews, elements of the second version of the framework were confirmed. However, there were also several critical comments that led to changes.

The most important change is a fundamental separation between the individual and the institutional level, which goes beyond the separation regarding the concrete OER Statistics and includes the methodological basis, the use cases and limitations. Accordingly, we present the framework in the evaluated version on two different visualizations (Figure 7 and 8).

The determination of a statistical data basis is generally challenging in scientometric analyses and is associated with many uncertainties that can falsify results. This is particularly difficult with evaluative assessments of individuals. To avoid this methodological weakness and incorrect or incomplete data in individual statistics, the data base should draw on support from the individual being evaluated—see the following quote:

> *... we should give more responsibility to those being evaluated making sure we have the data that we need. The academics, if they feel that what they are doing really matters like these contributions to OER, and they feel like they deserve to be recognized and rewarded for this, then there is a responsibility on their part to make visible the work they have been doing. […] And based on that, we should invite them or make them partly responsible for registering the things that matter to them. (research data (3): interview 2, page 14)*

Existing systems could be used to provide such lists, such as ORCID as a public data base or also current research information systems (CRIS) as they are common at universities and research institutes (research data (3): interview 4, page 23, 24). Of course, OER repositories can play a role here. However, these usually only include openly licensed artefacts and OER that can only be used free of charge but do not grant third parties any further rights of use. Consequently, the "data bases" (Figure 6) is renamed "use of manually compiled databases (in cooperation with those to be evaluated)" (Figure 7 and 8). The examination of a sufficient level of creation, especially in the case of revised or remixed OER, as well as sufficient quality as entry requirements for the OER Statistics, must then be carried out for the OER in the list. This qualitative approach leads to an enhancement of the methodological basis which is expressed by a new category "accompanying qualitative assessment" (Figure 7 and 8).

The determination of the document types to be counted is very important in the context of scientometric studies. For publications, the term "document type" is highly appropriate. However, teaching/learning objects such as OER can have many different representations (figures, slides, videos, tables, software etc.). The term "document" was therefore not considered to be a precise fit by the interviewees. To reflect this diversity in the methodological basis, the original term "document type" (Figure 6) is changed to "open artefact type" (research data (3): interview 2, page 2 – 3; interview 4, page 3, 4) (Figure 7 and 8).

The question which artefact types are considered is important in scientometrics in order to record work results provided by different counting units according to the same procedure and thus establishing comparability. The change in the recording procedure at the individual level results in further changes in the area of counting and weighting. At the individual level, all artefacts created by a person and recorded in their record of achievement for OER are fully counted, provided they meet the entry requirements of a sufficient level of creation and quality and are freely accessible and available. This includes OER at all levels of granularity. If a higher level of granularity OER (e.g., a textbook or course) is split into its individual parts and these lower granularity elements (e.g., chapters or figures) are also published as OER, this is explicitly permitted. The following quote stresses this point:

> *... I like the idea of small pieces that build others. (research data (3): interview 4, page 18)*

Due to our changes, we dispense the categorisation in terms of granularity on the individual level. In this way, we are responding to the fundamental criticism of the quantitative recording of the performance of individuals and the desire for a more qualitative assessment at this level. At the institutional level, all OER that fulfil entry requirements are recorded in the OER Statistics. The categorization by levels of granularity continues to happen here (research data (3): interview 2, page 3; interview 4, page 5, 15–16). "Attribution" is to OER what citation is to publications. Due to the adjustments to the methodological basis at the individual level described above, all OER meeting entry requirements are counted. As a logical consequence, all attributions must also be considered (research data (3): interview 2, page 4 – 5). "Weighting and counting" (Figure 6) is renamed "full counting of authorship and attributions" for both levels (Figure 7 and 8).

Normalisations and subject classifications are used in scientometrics for comparisons between different domains with different publication cultures and have become established there. At the individual level, a more qualitative approach is now chosen. Therefore, comparisons based on quantitative data are no longer focused as it can be on the institutional level. While subject classifications were seen positively due to their descriptive character, the usefulness of normalizations with the aim of comparisons was seen critically:

> *I see value in having some subject classification for descriptive purposes. Normalization we do for comparisons. So, what we want is to compare papers in chemistry with papers in humanities, for example. Unless it's super necessary I wouldn't bother. (research data (3): interview 4, page 6)*

This perspective was supported by others (research data (3): interview 6, page 14). Consequently, "normalisation & subject classification" (Figure 6) is deleted. At the institutional level, "disclosure of well selected subject classifications" remains (Figure 8).

For the correct interpretation of scientometric analyses, the underlying data and the tools and programming code used to perform the analyses are important. To avoid confusion, we adjust the terminology from "research data, software & code" (Figure 6) to "disclosure of research data, software and code" (research data (3): interview 4, page 10) (Figure 7 and 8).

Investigation of OER is highly complex, which requires a specific definition for a fair attribution of artefacts and services. This should include a sufficient level of creation and quality as a basic prerequisite for the countability of OER which was also emphasized in the expert interviews:

> *So, one question I have is ultimately the question of quality control. When we talk about scientific publications, you can't just publish in a journal, so to speak, but ultimately journal publications are always something that is also quality-checked. How is that with OER? Who does the quality assurance there? (research data (3): interview 1, page 3 – 4)*

The broad perspective on OER regarding their openness is important. The framework treats all artefacts as OER which are created for learning/teaching purposes and are freely accessible and available. An open license is not necessary as long as the artefact can be accessed and used free of charge. Furthermore, it is important that OER can be clearly identified in scientometric analyses (research data (3): interview 1, page 6). Accordingly, "consideration of OER requirements (persistent identifier; sufficient level of quality; sufficient level of creation)" was added to the framework for the individual and institutional level (Figure 7 and 8).

OER Statistics: Changes also occurred in the area of OER Statistics and their metrics. These derive in particular from the fundamentally stricter separation between the individual and institutional levels and the resulting different methodological bases.

At the individual level, the weaker emphasis on quantitative recording and a more qualitative assessment of services leads to an abandonment of the categorisation of OER in terms of granularity regarding the productivity indicators (research data (3): interview 2, page 6, 7). For this, qualitative methods are included (research data (3): interview 1, page 13–14; interview 2, page 4), which at the same time leads to a new box "accompanying qualitative assessment" (Figure 7 and 8). The following quote suggests the desirable integration of qualitative measures:

> *And by starting from some of these fundamental notions of what quality in that area means to then consider how can we demonstrate that quality in some kind of evidence that could be used in evaluations. […] Typically, then the alternative would be narratives for instance. (research data (3): interview 3, page 3)*

At the institutional level, however, the categories regarding levels of granularity remain (research data (3): interview 4, page 18, 19). We argue that qualitative assessment at an institutional level is no longer possible in detail and therefore coarser classifications are appropriate. Maintaining granularity can be useful in this context to give an impression of teaching performance. Nevertheless, qualitative methods can also be used at an institutional level. In this case, a report on teaching practices that also addresses OER as a component of open teaching practice would be conceivable. An institution's teaching profile could be described in these reports.

Percentiles could help in the evaluation of the position of an assessed entity (publication or researcher) within a citation distribution of their field (Waltman & Schreiber 2013; Bornmann & Marx 2014). For the calculation, a high-quality database is necessary. Percentiles could be calculated on the basis of attributions of OER as an equivalent to citation of publications. Due to the rather negative attitude shown by participants towards percentiles for OER, these were removed from the framework. The main criticism refers to the false accuracy suggested by percentile indicators. Ratios change strongly when only small changes were made to the data basis. These indicators are thus anything but robust and precise (research data (3): interview 2, page 6 – 7, 9). However, against the background of a possible profile representation, the idea of visualisation was transferred to simple counts of created artefacts. In this approach analogous to percentiles, the numbers of OER produced at certain time periods are plotted together with other scientific outputs (publications, data sets, etc.) also produced in these time periods (research data (3): interview 4, page 12).

One change to the indicator name relates to the indicators of openness known in bibliometrics. They were renamed from "open access indicators" (Figure 6) to "openness indicators" (Figure 7 and 8) to adapt them to the language used in the OER sector. Two indicators were removed from the framework: the OER-h-index and the OER-m-quotient. We do not base the deletion on comments from the interviews (these two specific indicators were not explicitly discussed), but there is general criticism of the indicators in scientometrics. This can be read in the following blog post and can be summarised with the following quote: "The use of a single unrepresentative, and in many cases even unfair, indicator based on publication and citation counts is not acceptable" (de Rijcke, Waltman & van Leeuwen 2021).

We included two new indicator types in the framework. The first new indicator focuses on the transfer of knowledge via OER from research to teaching and vice versa (research data (3): interview 1, page 6). These "transfer indicators" can record when, for example, research projects produce OER for teaching in addition to other output for both the individual and institutional level. The second new indicator is derived from the existing indicator on "OER certifications" at the institutional level and takes this dichotomous approach to the individual level (Figure 7 and 8).

Use cases: The use cases of the framework basically remain but are further specified. The explorative area at the institutional level is supplemented by the aspect of network analyses for researching

structures in the OER sector, e.g., at the level of the universities (research data (3): interview 2, page 16). The evaluative area experiences two additions with the inclusion of use case monitoring (research data (3): interview 2, page 11–12; interview 4, page 31) and the explicit mentioning of teaching profiles and incentive structures (Figure 7 and 8) which is clearly expressed by the following quote:

> *So, in the end, I need an incentive somewhere that I can also create when I say that in appointment procedures or in other contexts, they also look at what I have taught. (research data (3): interview 1, page 5).*

Limitations: The experts' opinions have also resulted in changes to the framework in terms of limitations. Currently, the data base is still slim due to a still insufficient culture in the creation, publication and subsequent use of OER, a differentiation has resulted. A distinction is now drawn between the technical and the statistical/mathematical dimension (Figure 7 and 8) to which the following quote refers:

> *You already have very, very small numbers for publications at the level of individuals. In other words, the number of publications by a person is difficult to determine statistically because the numbers are so small. The question for me now is, what does that look like for OER? I simply assume that the number of publications is even higher than the number of OER. That's why I'm not sure if we're not also moving in this area of small numbers or if the numbers are perhaps even smaller than for publications, to what extent this is actually statistically tangible. (research data (3): interview 1, page 3–4).*

OER Statistics focus on OER as artefacts for teaching and additionally as services within the framework of an OER ecosystem at the institutional level. The fact that OER can only represent a part of the teaching artefacts created and used is already covered by the previously outlined limitations. In order to clarify that teaching as a whole cannot be represented by OER alone, the framework has been expanded here. This can be seen in the figure of the framework by the formulation "no possibility of displaying teaching as a whole" ("material" was deleted) (research data (3): interview 3, page 20) (Figure 7 and 8).

Many limitations have been formulated in connection with scientometric studies in general which are outlined in the Leiden Manifesto (Hicks et al. 2015). Readers of these studies are also responsible for interpreting the quantitative results presented against the background of their calculation modalities and limitations (research data (3): interview 3, page 3 – 4, 19; interview 5, page 12). To emphasize this, we have added the aspect of "missing metric literacy" to the critical points summarized under the limitation "general scientometric problems" (Figure 7 and 8). The following quote stresses this point particularly clearly:

> *So, there's a question about literacy. Literacy of kind of what is in terms of understanding, what can people handle? The literacy that they have of metrics, indicators, data. And we need to recognize that in most settings that is limited. And that's not a problem. That's just a fact of life. But we should adjust the way we deal with data to the literacy that the people that need to ultimately make decisions that they have. (research data (3): interview 2, page 16)*

Furthermore, we include two new limitations. The first concerns the current lack of theoretical foundations (Figure 7 and 8), which are extensively available for bibliometric studies, but must first be carried out for the area of OER. This effect, for example, questions about the diversity of subject domains in teaching or attribution behaviour (research data (3): interview 1, page 12; interview 5, page 9–10, 19). The second supplement documents limitations that arise from the object of study OER itself. First and foremost, the voluntary nature of the creation, publication and subsequent use of OER should be mentioned, which represents a significant distinction from other academic output:

> *Then you probably need an institutional policy or something that says: You have to do this now. You have to upload your teaching materials onto these platforms so that we can map them accordingly. But I think that would probably not be entirely unproblematic. (research data (3): interview 5, page 4)*

Furthermore, the attribution practice of OER (research data (3): interview 1, page 6; interview 5, page 17), which is fraught with difficulties, as well as the great variety of possible forms and the resulting difficulty in comparing artefacts should be mentioned (research data (3): interview 1, page 14; interview 5, page 5). In summary, we added "OER-specific limitations (attribution practice of OER; large variety of possible forms of OER; difficulty to compare artefacts)" (Figure 7 and 8).

4.2.3. Summary

In summary, chapter 4.2. discusses the evaluation of the OER statistical framework by experts in scientometrics and the changes resulting from this evaluation. As a particularly relevant improvement through the evaluation, I would like to emphasize the addition of the qualitative dimension to the OER Statistics. It is important to show that the proposed framework is not a stand-alone instrument that by itself succeeds in making higher education teaching more valuable. Like all other scientometric methods, our contribution should be accompanied by qualitative peer assessments (chapter 2.4). I would also like to emphasize that I do not see the framework as final and conclusive but as dynamic and fluid. We would like our work to initiate a discourse. Actual appreciation of university teaching depends, at the end of the day, on the values and norms of the people who shape and form the academic landscape daily.

4.3. OER Statistics Framework

Chapter 4.3 presents the concept for the quantitative operationalisation of HETP for the academic RRS. In the following chapter 4.3.1, I address the basic principles of the OER Statistics Framework. Building on this, I consider the OER Statistics, i.e. the quantification of OER (chapter 4.3.2). At this point, I differentiate between the application and interpretation at an individual and institutional level. I see this distinction as one of the main changes that came from the framework evaluation (chapter 4.2). To conclude the chapter, the OER Statistics are discussed (chapter 4.3.3) and summarized (chapter 4.3.4). The concept of OER Statistics is published by the journal *Information – Wissenschaft & Praxis (IWP)* (Weimer & Kullmann 2025). The text sections have been adopted verbatim. Changes have only been made to ensure readability in this thesis.

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OER Statistics – individual level

Methodological Basics

- use of manually compiled databases (in cooperation with those to be evaluated)
- naming of all open artefact types considered
- full counting of authorship and attributions
- consideration of OER requirements (persistent identifier; sufficient level of quality; sufficient level of creation)
- disclose research data, software and code

Use Cases

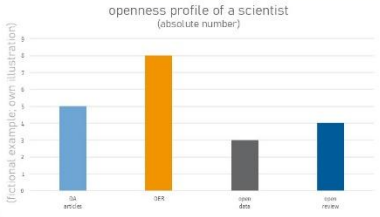
exploratory approach *(research method)*

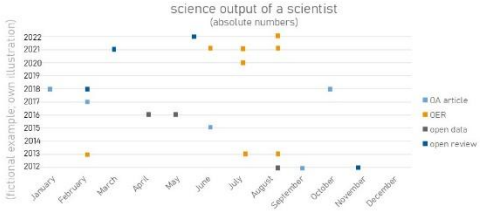
evaluative approach

- informed statistics for assessment purposes
- monitoring
- incentive structure for the future
- strengthening the second career path (teaching profile)

accompanying qualitative assessment

productivity indicators	total OER (OER count)
	number of Dedicated Learning Content
	number of Learning Design Content
	year of first publication (academic age)
	number of active years of OER publication (NAY)
	number of OER per year (arithmetic average)
cooperation indicators	number of contributing authors (NCA)
	number of OER publications as first author
	sole-authored OER (SA)
	co-authored OER (CA)
resonance indicators	total attributions (TA)
	number of attributed OER (NAP)
	proportion of attributed OER (PAP)
	number of attributions per OER (artithmetic average) (CAP)
	proportion of self-attributed in total attributions (%)
openness indicators	number of OER with a high degree of openness
	number of OER with a medium degree of openness
	number of OER with a low degree of openness
	number of free of charge material
altmetric indicators	downloads of OER
	views of OER
	bookmarks of OER
	social media conversations about OER
	number: mention in syllabi
transfer indicators	attribution in an OER to research material
	citation in a research material on OER
	OER material resulting from research projects
OER certification	(existing/not existing)





Limitations

- poor database (technical & statistical dimension)
- no possibility of displaying teaching as a whole
- general scientometric problems (missing metric literacy)
- lack of theoretical background
- OER-specific limitations (attribution practice of OER; large variety of possible forms of OER; difficulty to compare artefacts)

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Figure 7. third version of the OER Statistics (individual level)

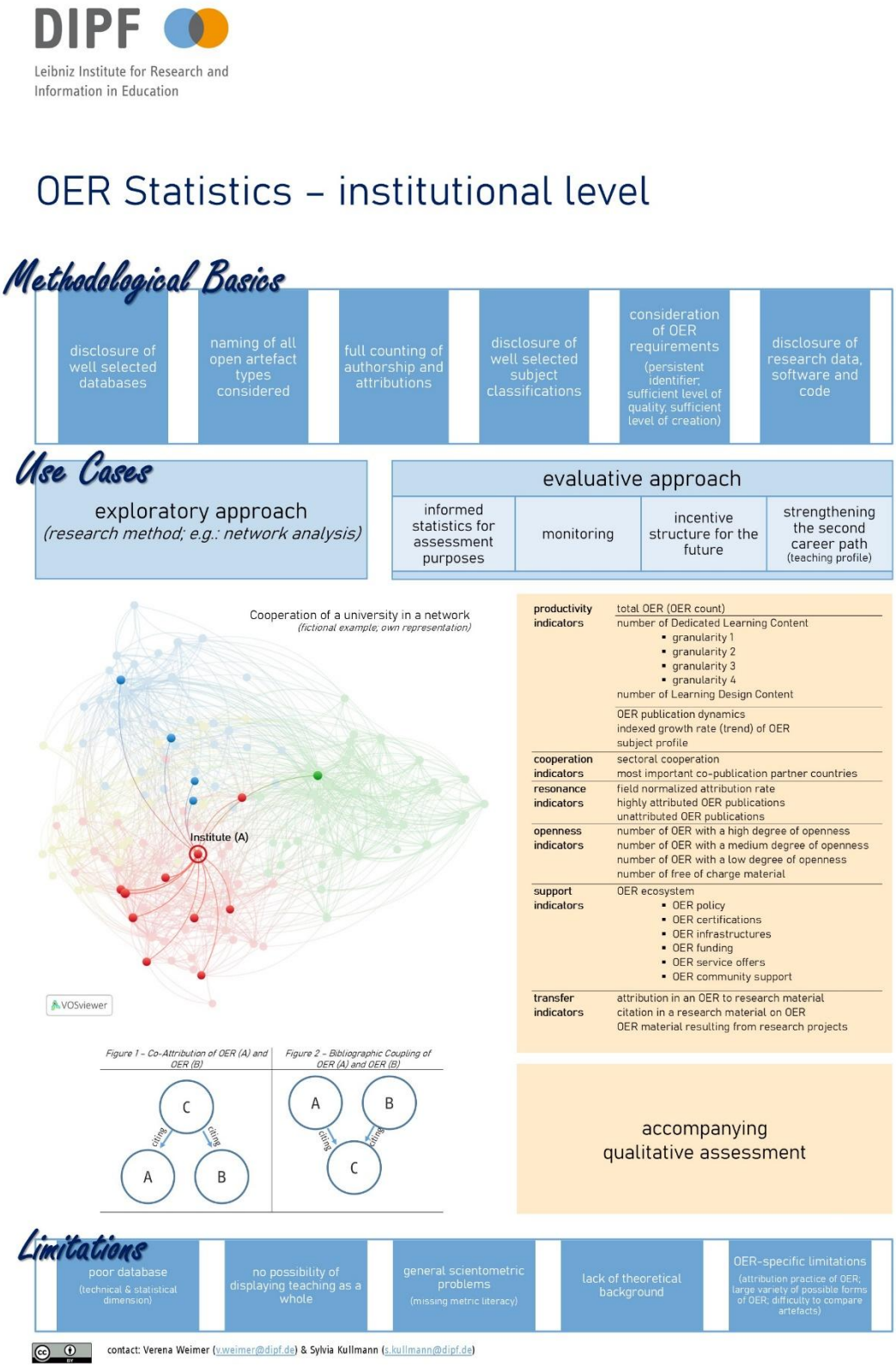

Figure 8. third version of the OER Statistics (institutional level)

4.3.1. Basic Principles of the OER Statistics Framework

First it is necessary to outline some basic principles that guide the development and application of an OER Statistics Framework. Researchers intending to apply scientometric methods to the object of OER need to make several key decisions.

1. Selection of materials: The first decision concerns which openly available teaching and learning materials are considered OER and thus included in the analysis. Like scientometric analyses in research evaluation, where the question arises which research output to count, OER evaluation requires clear entry criteria. The development and evaluation of the OER Statistics Framework (Weimer & Kullmann 2024) have shown that OER should be explicitly created for teaching/learning purposes and meet a sufficient level of personal contribution as well as an adequate quality standard (Kullmann 2025; Kullmann & Rasulzade 2025). Materials that are not intended for teaching should not be included, even if they are freely accessible, as these are already covered in academic evaluations in the research area (e.g.: research articles, research data, etc.). The authors stress that quality can be assessed through formal instruments such as IQOER (Müskens, Zawacki-Richter & Dolch 2022) or by certifications (Schön et al. 2021), but also through the professional qualifications of authors (Weimer & Kullmann 2024, 6069).

Furthermore, persistence and metadata are important prerequisites. OER should have a persistent identifier and be accompanied by structured metadata to ensure traceability and comparability (Weimer & Kullmann 2024, 6080; Kullmann 2025). In terms of categorisation, the OER Statistics Framework distinguish between *Dedicated Learning Content*, *Learning Design Content*, and contributions to the *OER ecosystem* (see chapter two of this paper), which helps to structure the diversity of resources. The development and evaluation of the OER Statistics Framework has shown that different levels of granularity must be considered, ranging from atomic objects like single figures to complex degree courses (Weimer & Kullmann 2024, 6080). Finally, we argue that at least evaluated individuals should ideally contribute to compiling their own OER dataset to ensure completeness and reliability (Weimer & Kullmann 2024, 6079). This would also be the best approach to institutional assessments.

These judgments determine the scope and comparability of the data set. They are made manually based on qualitative evaluation criteria. This procedure is similar to that of peer reviews. By demanding the unity of quantitative and qualitative procedures, we are in line with current RRA requirements (e.g., CoARA 2022).

2. Data access: A major challenge lies in the fragmented and heterogeneous landscape of OER repositories. The development and evaluation of the OER Statistics Framework revealed that one issue of conducting scientometric analyses on OER stems from the fact that repositories are frequently dispersed with inconsistent metadata and vary significantly in terms of their scope and accessibility (Weimer & Kullmann 2024, 6079). This makes it difficult to ensure complete coverage when constructing datasets for assessment purposes. The development showed that, unlike bibliometric databases for research publications, there is currently no centralised, comprehensive index for OER. Therefore, it remains unclear how representative the data is if the evaluated person does not actively compile their own OER portfolio. In addition, coverage gaps and redundancies across repositories can affect comparability between analyses. These issues raise significant questions of coverage, reliability, and transparency in the use of OER Statistics.

The solution to the infrastructure problem must be based on creating individual OER lists, ideally in collaboration with the researcher or the institution in question (Weimer & Kullmann 2024, 6076-6078). As with the selection of material, the solution to this decision-making problem lies in very careful, manual approaches rather than data-driven ones. All decisions must be carefully documented. It should be clear which databases were used and why.

3. Counting method: Another methodological decision is whether to apply full counting (crediting each co-author with one full contribution) or fractional counting (dividing credit among co-authors). The development and evaluation of the OER Statistics Framework pointed out that this choice has a strong impact on the comparability of results, since OER are often created collaboratively and may involve not only academic staff but also designers or IT specialists. Full counting can inflate output measures by giving each contributor equal full credit, while fractional counting distributes credit more proportionally. We emphasise that scientists must explicitly state which approach they use, as the interpretation of productivity and collaboration indicators in OER Statistics depends on this methodological decision. This choice significantly influences output measures and comparability across scientists and institutions (Weimer & Kullmann 2024, 6083). It is advisable to specify both counting methods to ensure the most comprehensive insight into the data possible. Specifying the full counting method and the fractional count allows the different results to be compared.

4. Attribution window and self-attribution: Researchers also decide which attribution window to use for counting attributions (analogous to citation windows in research evaluation) and how to handle self-attributions. The development of the framework has revealed the significant impact of these methodological constraints on the resonance indicators of OER Statistics. A short attribution window may underestimate long-term reuse of OER, while a longer window risks diluting the signal with noise. The results of the framework evaluation also showed that self-attributions - when creators themselves reuse their own OER in new contexts - can artificially inflate resonance measures if not clearly separated from external attributions. Therefore, explicit reporting on the chosen attribution window and treatment of self-attributions is essential to ensure transparency and valid interpretation of OER impact (Weimer & Kullmann 2024 6083). As with decision regarding counting methods, it is better to include more information than less in scientometric analyses. Different attribution windows can be specified (e.g., three years and 10 years), and calculations with and without self-citations can be specified.

5. Field normalization: Finally, the question arises whether field normalisation should be applied to OER indicators. The results of the framework evaluation suggest that disciplinary differences in teaching practices and OER uptake between disciplines can have a significant impact on raw counts. Applying field normalisation can therefore help to make outputs from different subject areas more comparable. However, this requires a justified decision on which classification scheme to use, as various taxonomies exist and each brings specific advantages and drawbacks. Without clear justification, normalisation may introduce new bias rather than eliminate it. If normalisation is applied, the rationale and chosen classification system must be documented transparently, since it shapes whether differences reflect genuine disciplinary variation or field-specific practices (Weimer & Kullmann 2024, 6079). Field normalisations make no sense at the individual level, as comparisons between individuals should generally be avoided. At the individual level, publication sets are often too small to yield statistically robust values, making results highly sensitive to single outliers. Moreover, career stage, role in collaborations, and diverse forms of academic contributions cannot be adequately reflected in normalised citation scores. Using them to compare individuals therefore risks oversimplification and misinterpretation and contradicts widely accepted principles of responsible research assessment. At the institutional level, it is advisable to present results with and

without field normalisations. Interpretations should take both approaches into account and explain how the results differ in each individual case.

These principles serve as the foundation for the operationalisation of OER Statistics and are essential to ensuring methodological transparency and comparability. Based on these methodological decisions, scientometric indicators can be applied.

4.3.2. OER Statistics

In the following, I present the OER Statistics separately for the individual (chapter 4.3.2.1) and institutional level (chapter 4.3.2.2). The application of OER Statistics at the individual level means the scientometric evaluation of OER performance of individual scientists. The institutional level on the other hand refers to the analysis of universities, research institutions or similar organizations. We separate these areas here because the context and use cases are different, as are the circumstances of the evaluations. With respect to the basic methodological assumptions, there are potentially different choices to be made, and some metrics and visualisations only make sense at one level but not the other.

We do not consider the OER Statistics as presented here to be a rigid evaluation concept, but we rather think this is a suitable basis for conducting scientometric studies on the topic of OER. It is just as important to realise that a concept for OER Statistics is presented here but not associated rules for implementation. These should clarify key issues such as the fulfilment of the entry requirements (sufficient quality and level of creation) for eligible OER resulting from the underlying OER definition.

4.3.2.1. Individual Level

OER Statistics at the individual level show both how much and in what form individual academics have published open teaching/learning material and the extent to which this has been received. Table 9 lists scientometric indicators for the recording of OER.

productivity indicators	**total OER (OER count)** ▪ number of “Dedicated Learning Content” ▪ number of “Learning Design Content”
	year of first publication (academic age) number of active years of OER publication (NAY) number of OER per year (arithmetic average)
cooperation indicators	number of contributing authors (NCA) number of OER publications as first author sole-authored OER (SA) co-authored OER (CA)
resonance indicators	total attributions (TA) number of attributed OER (NA-OER) proportion of attributed OER (PA-OER) number of attributions per OER (arithmetic average) proportion of self-attributed in total attributions (in %)
openness indicators	number of OER with a high degree of openness number of OER with a medium degree of openness number of OER with a low degree of openness number of free of charge material
altmetric	downloads of OER

indicators	views of OER bookmarks of OER social media conversations about OER number of blogposts number: mention in syllabi
transfer indicators	attribution in an OER to research material citation in a research material to OER OER material resulting from research projects
OER certification	(existing/ not existing)

Table 9. OER indicators on individual level

The indicators are grouped into seven categories, each reflecting a different dimension of OER activity and/or impact: **Productivity indicators** measure the overall output of OER creation. These include the total number of OER (OER count), the number of specific types such as "Dedicated Learning Content" and "Learning Design Content," the academic age (year of first publication), the number of active years of OER publication (NAY), and the average number of OER published per year. **Cooperation indicators** capture collaborative aspects of OER creation. This includes the number of contributing authors (NCA), the number of OER published as first author, as well as distinctions between sole-authored (SA) and co-authored (CA) OER. **Resonance indicators** focus on the extent to which OER are attributed and reused. Metrics include total attributions (TA), the number of non-anonymous attributions (NA-OER), the proportion of attributed OER (PA-OER), the average number of attributions per OER (CA-OER), and the proportion of self-attributions in total attributions. **Openness indicators** evaluate the degree of openness. These include the number of OER with high, medium, and low degrees of openness, as well as the number of free-of-charge materials. **Altmetric indicators** assess the broader visibility and engagement with OER through alternative metrics. These include downloads, views, bookmarks, social media discussions, blog posts, and mentions in syllabi. **Transfer indicators** reflect the connection between OER and research. They track whether an OER attributes research material, whether it is cited in research outputs, and whether it originates from a research project. **OER certification** simply notes whether certification for the OER exists or not (Schön et al. 2021).

All indicators can be taken from corresponding data sets if the data is recorded and made available.

4.3.2.2. Institutional Level

To gain a comprehensive understanding of how OER are embedded within higher education institutions, it is essential to look beyond individual contributions and examine aggregated data at the organisational level. Institutional OER Statistics capture the structural, strategic, and collaborative dimensions of OER engagement, encompassing productivity trends, openness levels, attribution patterns, and institutional support systems. The indicators outlined in Table 10 provide a multidimensional framework for evaluating how institutions contribute to and sustain OER ecosystems, including aspects such as co-publishing networks, policy development, funding mechanisms, and links between research and teaching through OER. These metrics enable comparative analyses across institutions and inform strategic decision-making for advancing open education at scale. Established methods for evaluating institutions served as a basis here (see for example DZHW (2021)).

productivity indicators	**total OER (OER count)** ▪ number of "Dedicated Learning Content" • granularity level 1 (single, atomic learning objects) • granularity level 2 (units from atomic learning objects) • granularity level 3 (collections of units) • granularity level 4 (set of courses leading to a degree) ▪ number of "Learning Design Content"
	OER publication dynamics indexed growth rate (trend) of OER subject profile
cooperation indicators	sector cooperation most important co-publishing partner institutions most important co-publishing partner countries
resonance indicators	mean normalized attribution score (MNAS) highly attributed OER unattributed OER
openness indicators	number of OER with a high degree of openness number of OER with a medium degree of openness number of OER with a low degree of openness number of materials free of charge
support indicators	OER ecosystem ▪ OER policy ▪ OER certifications ▪ OER infrastructures ▪ OER funding ▪ OER services ▪ OER community support
transfer indicators	attribution in an OER to research material citation in a research material to OER OER material resulting from research projects

Table 10. OER indicators on institutional level

The OER indicators at an institutional level are grouped into six categories, each capturing a different dimension of institutional OER activity. **Productivity indicators** reflect the volume and characteristics of OER output produced by an institution. This includes the total number of OER as well as distinctions between "Dedicated Learning Content" and "Learning Design Content." Dedicated content is further categorized by levels of granularity - from atomic learning objects (level 1) to full course sets leading to a degree (level 4). The "*OER publication dynamics*" represent the average growth per year in a defined observation period. The calculation is defined as

$$\text{OER publication dynamics } (t_0, t_T) = \left(\frac{OER(t_T)}{OER(t_0)}\right)^{\frac{1}{|T|}} - 1$$

where t_0 and t_T denote the first and last year of the observation period and |T| the number of observation years.

Regarding the "*indexed growth rate (trend) of OER*", the publication figures for the first year are set equal to 100. A relative value is calculated for the following years, which can be used to read off the percentage difference. Values above 100 indicate growth and values below 100 indicate a decline in the OER growth rate. These two indicators are particularly interesting for a new field such as OER. There might be many institutions that have published no or very few OER. If these institutions are now slowly starting to create and publish OER, then it is valuable to track this development.

Determining a "*subject profile"* of an institution can be very helpful to indicate in which disciplines the organization is strong in open teaching.

Cooperation indicators address the extent and nature of institutional collaboration in OER production. They capture sector-level cooperation and identify the most frequent co-publishing partner institutions and countries, providing insight into the geographic and organizational scope of OER partnerships.

The **resonance indicator** "*mean normalized attribution score*" (MNAS) indicates how often the OERs were attributed in relation to similar comparison values (field- and time-normalized benchmarks). The calculation is as follows:

$$MNAS_o = \frac{1}{|P_o|} \sum_{i=1}^{P_o} \frac{c_i}{EAR_i^{field}}$$

P_o is the number of publications of the object o (institution), c_i the attributions of the i-th OER in the selected timeframe and EAR_i^{field} the expected attribution rate of the field the OER is assigned to. The global expected value is 1. A higher value can be rated as above average and a lower value as below average. Average values can provide very interesting insights into the data but should also be treated with caution - they are only meaningful when the data is normally distributed.

"*Highly attributed OER*" can also be of significance. This indicator shows what percentage of the data set belongs to the 10% of the most frequently attributed OER in the subject area and publication years. The expected value is 10%. If an institution has more than 10% in the top 10% attributed OER in the time and discipline under consideration, then we can assume that the OER are exceptionally highly attributed. As a final resonance indicator, we consider the percentage of "*unattributed OER*".

Openness indicators evaluate the degree of openness of OER materials. They distinguish between OER with high, medium, or low levels of openness and include the number of materials that are freely accessible to users, thereby highlighting the accessibility and licensing characteristics of institutional OER output.

Support indicators describe the institutional ecosystem that enables OER development and sustainability. This includes the presence of OER policies, certification programs, supporting infrastructures, dedicated funding, institutional services, and the degree of community support for OER initiatives within the organization.

Transfer indicators focus on the relationship between OER and research. These measure whether research outputs are cited in OER, whether OER are cited in research publications, and whether specific OER materials have emerged directly from research projects.

4.3.3. Discussion

4.3.3.1. Possibilities and desired effects

OER Statistics can be used to make university teaching visible in science evaluations and thus accessible for academic recognition and reward. Through their application, they can contribute to an equal consideration and appreciation of research and teaching if published teaching material in the form of OER is recognised as the equivalent of published research output.

At the micro level, this can imply that OER Statistics are used in application and appointment processes. This means that applicants include in their applications (resp. in their CVs) not only

published achievements in research (for example, articles and book chapters) but also publicly available achievements in university teaching (e.g., public teaching materials). This practice can address the imbalance in the value placed on research and teaching that has existed to date. Mentioning teaching material can provide a more nuanced insight into the applicant's academic performance. Another advantage is that the person can explicitly list what his or her strengths in teaching are and what he or she focuses on. The reviewer has the direct opportunity to gain an insight into the applicant's teaching material. They can decide whether expertise in the required field is available and whether there are content-related dissimilarities. Possibly the applicant and the reviewer disagree about paradigmatic details. This could lead to interesting insights before the interview and be the basis for engaging discussions. In addition to disclosing content, applicants could also show that they are interested in implementing Open Science practices. For example, it could be argued that people of course also could submit (non-open) teaching samples with their applications. By publishing OER, however, applicants can also show how they work in their teaching activities and that they are happy to share knowledge and act in accordance with Open Science practices. If these practices are desired in the department, then it could be an advantage for the applicant and both teaching and Open Science practices would be successfully established in science evaluations.

At the meso and macro level, the OER Statistics could for example be used in the context of institutional evaluations. The science evaluations could thus be further differentiated with respect to the area of university teaching. Through the quantifying perspective on teaching performance, this area can be represented in a more multidimensional way and lead to an equal appreciation of research and teaching. In addition, universities and institutions have more of a chance to develop an individual profile. Research profiles are customary to universities. Individual universities often claim to be highly research-oriented in a particular field of science. OER Statistics could highlight the possibility that universities and institutions also boast a special teaching profile, it could then be said that a university is particularly strong in teaching a subject.

Besides the use in science evaluations, OER Statistics could also be a monitoring tool. For example, in higher education policy monitoring: if a university or institution decides to adopt an OER policy, then the question of whether this policy leads to the desired goal is relevant. Does the adoption of the policy have an effect? To investigate such and other questions of higher education policy, differentiated instruments are needed. OER Statistics can help to answer this question comprehensively and to monitor the OER landscape. The same applies to the use of monitoring tools in the Open Science context. The promotion of Open Science is a frequently made demand, both from the political and the practical side. In this respect, monitoring is also interesting: are Open Science efforts limited to the research area, or do they also take teaching practice areas into account? For such and similar questions, the OER Statistics can be a suitable monitoring tool.

Finally, the OER Statistics Framework can be used for exploratory research. Questions about typical characteristics of OER authors, author networks, particularly OER-friendly subject areas, or typical points in academic careers at which OER are created more frequently are just some of the many research questions that can be asked.

The OER Statistics Framework was designed for these purposes and use cases. As has become clear, its intended effects are as follows.

The OER Statistics Framework aims to enhance the visibility and recognition of teaching in the academic context, which, compared to research, has traditionally been undervalued. Through measurable indicators, educators can demonstrate their achievements in the field of OER, thereby expanding the framework for evaluating academic work and supporting the goals of RRA. The

overarching objective is to provide scholars with the opportunity to gain recognition and visibility for the time and care they invest in the development of teaching materials. In this way, OER indicators may contribute to teaching activities being more strongly acknowledged and valued — ultimately leading to a reputational gain for educators (Weimer & Kullmann 2024, 6085).

In addition to this primary objective of the OER Statistics Framework, three further positive side effects can be identified: first, the promotion of open science practices; second, the possibility of developing institutional teaching profiles; and third, the potential for assessing the impact of OER strategies.

OER Statistics can foster open science practices by making visible the extent to which openly licensed teaching materials are used, adapted, and reused. This visibility increases the value of such materials and creates incentives for both educators and institutions to share their knowledge. By making the relevance and outreach of OER measurable, OER Statistics also strengthen the motivation to develop innovative didactic concepts and make them accessible to the academic community. Thus, OER Statistics do not only contribute to the establishment of a culture of sharing but also reinforce the fundamental principles of Open Science (Weimer & Kullmann 2023, 676).

At the institutional level, OER Statistics can serve as a tool for higher education policy and governance. By systematically recording the areas and intensity in which OER are developed and applied, they make the teaching profiles of universities visible—analogous to the already established research profiles. This transparency enables institutions to highlight strengths and focus areas in teaching, identify fields for development, and sharpen their positioning in both national and international competition. In doing so, universities gain a data-driven foundation for making more informed strategic decisions in the field of teaching (Weimer & Kullmann 2023, 676).

Finally, OER Statistics play a crucial role in the evaluation and further development of institutional OER strategies. By capturing the use, outreach, and impact of open teaching materials, they reveal the extent to which strategic measures to promote OER are effective. As a result, they provide an important feedback instrument for university leadership, funding bodies, and policymakers, enabling reflection on existing strategies, necessary adjustments, and transparent communication of their effectiveness. Linking measures with measurable outcomes makes progress traceable and supports the evidence-based advancement of institutional and national OER policies (Weimer & Kullmann 2023, 676).

4.3.3.2. Limitations and undesired effects

Quantitative methods are always accompanied by a limited view of products, practices and processes. Just as scientometrics does not measure performance and/or quality in research, OER Statistics do not measure the performance and/or quality of academics in university teaching. Just as scientometrics can quantify research output, scientometrics can quantify published teaching output. No conclusions about quality or similar should be drawn from the pure statistical numbers. Furthermore, it must be emphasised that OER Statistics only refer to published free of charge and ideally in addition openly licensed teaching material and do not provide any insight into university teaching in its entirety. Of course, much more happens in universities that cannot be represented by teaching material. This is also a scientometric limitation that applies to the area of university teaching just as much as to the area of research. This circumstance must be dealt with by working carefully in the interpretation of science evaluations.

These limitations mean that OER Statistics can have undesirable effects if not used carefully. Four of these are discussed below: The risk of one-sided quantification, the transferring of problematic

effects from research, potentially problematic efficiency logic and potential distortions in teaching and inequality due to lack of OER experience.

The most prominent negative effect is the frequently raised concern, that OER Statistics may further intensify the focus on measurable outputs. Instead of placing the quality of teaching at the centre of evaluation, the system could simply expand to include additional metrics. This trap of (ac)countability implies that easily measurable indicators – such as the sheer number of OER published – would become the main benchmark. As a result, pedagogical effectiveness or content depth may be overshadowed by quantity. For the academic community, this would mean that the system of recognition and rewards does not fundamentally improve but is merely extended by yet another quantitative component, without adequately capturing the true quality of teaching (Weimer & Kullmann 2023, 676). To counter this effect, quantitative effect, quantitative indicators should always be complemented by qualitative assessments, such as peer review or narrative evaluations, ensuring that the educational value of OER remains central to evaluation processes.

Another unintended effect points to parallels with well-known side effects of classical research metrics. Many fear that mechanisms such as the strategic fragmentation of publications could also be applied to OER. In research, this is described as publishing in the least publishable unit (salami-slicing). In the OER context, it could mean that instructors split their teaching materials into numerous small parts to inflate the number of countable OER. While this might satisfy the metrics, it would add little pedagogical value. Instead, the authors risk generating a flood of fragmented resources that lack coherence and quality. For teaching practice, this could mean that not the best or most innovative OER are highlighted, but rather those that are easiest to multiply and count (Weimer & Kullmann 2023, 676). This risk can be mitigated by carefully selecting OER for scientometric analysis, as outlined in chapter 4.3.1.

There are also concerns about unintended effects that specifically affect teaching practices. If OER indicators become a standard component of evaluation, they might promote a logic of efficiency that emphasizes cost reduction rather than enhanced visibility of teaching. For instance, core courses or introductory modules might continue to rely on the same OER for years, with little incentive to revise or update them once they have been published and recognized. Furthermore, it has been discussed that instructors who use OER could, in some cases, be accredited with fewer teaching achievements than colleagues who do not. This could result in them having to teach more courses to receive the same recognition. In such a scenario, instead of empowering teaching, OER Statistics could become a mechanism that increases workload while primarily serving institutional efficiency (Weimer & Kullmann 2023, 676). Addressing this risk requires a broad, ongoing discourse that involves not only policymakers and higher education leaders but also researchers, instructors, and other stakeholders. Only through such collective negotiation can OER indicators be designed in a way that promotes meaningful teaching practices rather than reinforcing narrow efficiency logics.

A final critical point concerns the unequal starting positions among instructors. Not all educators have the experience, resources, or skills to create or consistently use OER. If OER indicators become part of performance assessments, those without such experience risk being disadvantaged, even if their teaching is of high content quality and didactic value. This outcome would not only be unfair but could also exert pressure on faculty to produce OER for strategic rather than educational reasons. The danger is that authenticity and diversity in teaching would suffer, as instructors might feel compelled to conform to a standard that does not fit all disciplines or teaching approaches. Instead of OER being understood as a voluntary enrichment of teaching, an implicit obligation could emerge, undermining the original idea of openness and autonomy. Practical remedies include offering professional development, infrastructure, and support services that enable all instructors to

engage with OER voluntarily and at their own pace, while ensuring that high-quality teaching without OER continues to be valued equally.

Overall, scientometric analyses of OER have the potential to enhance teaching within academic evaluation and strengthen open educational practices. However, these opportunities can only be realized if the methodological challenges are addressed transparently and possible undesirable side effects are continuously reflected upon.

4.3.4. Summary

Chapter 4.3 presents and discusses OER Statistics. It describes scientometric instruments that quantify freely accessible teaching/learning material (with a sufficient level of creation and quality) and make it accessible for scientometric science evaluation. The chapter explains the basic principles of the OER Statistics Framework and the OER statistic indicators itself at individual (chapter 4.3.2.1) and institutional level (chapter 4.3.2.2). I discuss the potential of OER Statistics in the context of science evaluation as part of the RRS. It is clear that the emergence of OER brings along the opportunity to consider teaching in the context of scientometric performance evaluations and therefore broadens the view on academic performances. The main opportunity here lies in the simultaneous visibility and appreciation of research and teaching in the evaluation of science.

Furthermore, limitations are highlighted. Just as scientometrics does not measure performance and/or quality in research, OER Statistics do not measure the performance and/or quality of academics in university teaching. Just as scientometrics can quantify research output, scientometrics can quantify published teaching output. Metrics literacy and sound documentation of scientometric analysis (Ng et al. 2024) are therefore necessary conditions in both areas to prevent the misinterpretation and misuse of scientometric data. The Framework warns against the misuse of OER Statistics, as is often the case with the h-index or Journal Impact Factor (JIF). OER Statistics provide analyses and results that should be considered and evaluated in their context. They cannot stand alone and be meaningful based on pure figures. Especially at an individual level, these statistics must always be accompanied by qualitative assessments to say something about what should be recognised and rewarded. OER Statistics can only support these qualitative processes. The statistics can provide an overview of a person's work. Outstanding work can be identified (e.g. through the indicators "total attributions (TA)" or "download of OER"), which should be then examined for content in a subsequent peer review.

The concept of OER Statistics presented here is purely theoretical. Practical questions and feasibility analyses based on the actual situation, for example regarding current practice and the available infrastructure for data collection, have deliberately not been considered to prevent the influence of possible limitations in practice from affecting the conceptual level.