Open Educational Resources and their global needs, benefits and practices: The call for a future research agenda

Christian M. Stracke ⁱᴰ, Aras Bozkurt ⁱᴰ, Rory McGreal ⁱᴰ, and Olaf Zawacki-Richter ⁱᴰ

Abstract— **This paper reports the global initiatives that advocate and promote open educational resources (OER) and focuses on the main benefits of OER for our global society. Comparing and integrating diverse publications and studies, 40 main benefits of OER can be identified in total, clustered in six categories, namely: character, financial, design, learners', organisational and social benefits. Being justified by the broad benefits of OER, this paper argues that there is a need for creating a future OER research agenda. Such a global research coordination is currently lacking. Through their identified diverse benefits, OER can support learning designers, educators, learning providers and educational systems. And OER can also contribute to improve education worldwide and to achieve the Sustainable Development Goals (SDG) of the United Nations, in particular, SDG No. 4 to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". The UNESCO Recommendation on OER offers a new opportunity to annually report on OER status and progress. Therefore, this paper calls open education and OER advocates to take local actions so that we can collectively make a global impact.**

Index Terms—**Global needs analysis, OER benefits, OER practices and research, Open Educational Resources (OER), Sustainable Development Goals (SDG), SDG No. 4, UNESCO Recommendation on OER, United Nations Educational, Scientific and Cultural Organization (UNESCO), Future OER research agenda**

I. Introduction

The global movements for Open Educational Resources (OER) have originated in many grassroots initiatives [1]. They are sharing the same vision of education for all as a human right. From the beginning, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has strongly facilitated and supported the OER movement through the two World OER Congresses (2012 in Paris and 2017 in Ljubljana). Indication of the strong dedication, UNESCO member states and OER experts worldwide have developed the UNESCO Recommendation on Open Educational Resources that was discussed and approved at the 40th assembly of UNESCO in 2019 in consensus by all 194 member states [2]. Based on these UNESCO recommendations all countries have committed themselves to report on the status and development of OER. As a global research community, we can and should contribute and support them through coordinated scientific research and studies worldwide [3], [4].

C.M. Stracke is Coordinator for Virtual Collaboration at the University of Bonn, Germany (Corresponding e-mail: stracke@opening-up.education).

A. Bozkurt is an Associate Professor of Distance Education at Anadolu University, Turkey (email: arasbozkurt@gmail.com).

R. McGreal is a Professor in the Centre for Interdisciplinary Studies at Athabasca University, Canada (e-mail: rory@athabascau.ca).

O. Zawacki-Richter is a Professor of educational technology at the University of Oldenburg, Germany (e-mail: olaf.zawacki.richter@uni-oldenburg.de).

Based on the aforementioned context, this article discusses research gaps and opportunities related to OER and their global needs, benefits, and practices. We invite all researchers, experts, practitioners, and interested parties to join our research agenda to gain deeper insights into how to improve the (re-)use of OER.

II. OER and Their Global Needs and Benefits

OER represent contributions to the commons. One of their main benefits is easier access to learning material, content and applications for all. In this way, they can be used to complement the educational curricula as well as to enrich the educational systems worldwide [5]. However, the potentials of and needs for OER have not been fully explored and exploited [6]. Furthermore, the benefits that OER can provide are not yet widely known by educators, and administrators worldwide. Therefore, we summarize in the following key arguments why OER use should be promoted and applied.

The global needs for OER can be adduced and documented indirectly through the continuing lack of educational opportunities worldwide and the insufficient investment in education by governments [7]. The United Nations' Sustainable Development Goal (SDG) No. 4 is there to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Despite the commitment by governments worldwide, the educational systems and ministries are failing to achieve it. As documented by UNESCO, it can be argued that OER can play a significant role in supporting SDG goals due to their many benefits [2]. However, a global coordination of the OER research is currently lacking [8]. Through the identification of the main OER benefits, we want to facilitate a first step towards such a close collaboration of researchers worldwide.

The benefits of OER are multifaceted, diverse, and also both in relation to their objectives and to the potential learning achievements. Diverse publications and studies are discussing the benefits of OER from multiple perspectives. In our analysis and comparison, we could integrate them into one outline. Table I provides this overview of the 40 main benefits of OER: They are clustered in six categories, namely: character, financial, design, learners', organisational and social benefits. All benefits are only assigned to one key category even though we are aware that there are many overlaps.

On the other hand, some disadvantages of OER should be acknowledged. First of all, the quality of OER is being debated, however, the quality of commercial publications, learning content, studies, and even of articles in prestigious journals is also being questioned due to the increasing internal assessment and pressure for publications to be promoted and as a consequence of the rapid growth in available publications as well as in learning content [9]. The presence of an open license or commercially restricted license has no effect on the quality of the content or application. Second, the required time for creating or adapting OER is a common complaint by many who do not use OER. OER users do not have to create. They can and do adopt OER "as is" or make minimal adaptations, thus, they use OER to avoid the need to create new content [1]. Moreover,

TABLE I
MAIN BENEFITS OF OER

Character Benefits

1. Access	Learners as well as designers, educators, and institutions can freely access OER worldwide.
2. Licenses	OER ensure through their precise licenses what learners and educators can do with them.
3. Availability	OER are available for all in contrast to copyright-restricted commercial content.
4. Speed	OER are quickly and directly accessible instead of longer commercial publication processes.

Financial Benefits

5. Distribution	OER can easily be disseminated in large amounts with affordable costs.
6. Purchase	Designers, educators, and institutions are saving costs by using OER instead of buying commercial content.
7. Resource	Learners are saving costs by using OER instead of buying commercial textbooks and publications.
8. Integration	OER can support the implementation of packaged materials through automated plug-and-play with no permissions required.

Design Benefits

9. Augmentation	OER can enrich and complement other content, such as standard textbooks and courses.
10. Personalisation	Based on specific learning needs, designers, educators, and institutions can re-use OER and adapt them for other classes/courses.
11. Diversity	OER can ensure the representation of many different perspectives to be inclusive for all.
12. Control	OER enables designers, educators, and institutions to maintain control of their curricula.
13. Technology	OER can be readily adapted for use with new emerging technologies to incorporate the latest news, global peers, and mass audiences.
14. Multimedia	OER can be readily combined through the integration of different types of media resources.
15. Maintenance	OER can be housed locally and modified using in-house knowledge, technologies, and resources.
16. Improvement	OER can be internally updated and continuously improved based on feedback and changes in the curriculum.

Learners' Benefits

17. Equality	OER offer the same quality and conditions for all learners at any time.
18. Experience	New pedagogical approaches and concepts facilitated by OER can lead to better learning.
19. Individualisation	Designers, educators, and institutions can re-use OER and adapt them for individual learners.
20. Involvement	OER can be created, modified, and adapted by learners for direct and self-regulated engagement.
21. Collaboration	Learners can jointly develop and improve OER also in virtual groups and online communities.
22. Progress	Through availability at best timing for all, OER can support learners during their learning processes and chosen pathways.
23. Success	Through free access to quality material, OER can improve the learning results and outcomes.
24. Retention	OER help learners continue their learning pathways and complete their classes and courses.
25. Lifetime	OER can offer life-long learning at any time in educational and professional career and life.

Organisational Benefits

26. Standard	Institutions and public authorities can implement OER policies as the default standard.
27. Methodology	Designers, educators, institutions, and public authorities can introduce adaptation, assembly and production processes for OER.
28. Innovation	The adaptation, assembly, and creation of OER can lead to new approaches and concepts in education.
29. Scholarship	OER can enrich educational processes by offering alternatives within an organisation.
30. Scalability	OER can bring excellent educators and high quality to more learners.
31. Recognition	Developers and designers of OER are gaining reputation worldwide for their works that advocates openness and other universal values.
32. Showcase	OER can demonstrate the expertise, innovation and talent of educators and institutions for recruiting.
33. Graduation	Through the support of learning success, OER help to increase the number of graduations.

Social Benefits

34. Relationship	OER can facilitate keeping contact with alumni and external stakeholders through dedicated freely accessible learning opportunities.
35. Networking	Designers, educators, and institutions can establish networks for OER collaboration.
36. Equity	OER can facilitate equitable education for all learners worldwide through free access.
37. Inclusiveness	OER can support inclusive education for all learners worldwide through diverse formats.
38. Justice	OER can offer new learning opportunities for disadvantaged groups.
39. Democratisation	OER enable all societal parties to publish, present, share and discuss their opinions.
40. Society	OER can contribute to improve education for all as Sustainable Development Goal No. 4.

upfront investment into the adaptation or creation of OER is quickly paid back through the positive effects in the revision and improvement of them. Third, the OER licenses are considered to be complicated, however, the legal conditions for using commercial content are even more complex and non-transparent and impossible to work with when working in different copyright jurisdictions [2].

Analysing these disadvantages, we can argue that these issues are not specific to OER but relate to any type of educational resources (OER as well as commercial content). Besides, they often result from an incomplete fulfillment of the OER definition or an unfavourable introduction to learning processes and educational practices without pedagogical reflections and adaptations.

In summary and acknowledging their identified diverse benefits, OER can support learning designers, educators, learning providers and educational systems, and OER can also contribute to improve education worldwide and to achieve the Sustainable Development Goals (SDG) of the United Nations, in particular, SDG No. 4 to

"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" [10].

III. OER PRACTICES AND RELATED RESEARCH

The OER practices are countless and differ among institutions, regions, countries, and educational traditions and cultures. Key influencers for OER practices are (mandatory or voluntary) policies, internal and public promotion, and established support services including OER development processes, assistant teams, coaching and qualifications as well as financial instruments such as funding of open access publications, incentives, and pilot project funds for OER development and integration. The OER landscape is complex and diverse. Regional conditions and needs are vast varying demanding for specific developments. In particular countries with low income can benefit from organisational support such as institutional OER repositories [11]. However, there is no complete overview and no central collection of good practice examples.

OER research started to reveal and analyse the richness and ongoing efforts to mainstream the original grassroot initiatives into a strong global movement [12]. First studies have started to spotlight and illuminate special aspects of OER practices and related theoretical or conceptual thoughts [10]. However, the OER research is still in the early stages, in particular in relation to evidence-based results of the hard facts such as resource investments, cost savings, and learning success rates [13], [14].

IV. THE CALL FOR A FUTURE OER RESEARCH AGENDA

Openness in education and its practices such as OER have impacted the educational landscape and emerged as a major paradigm across the globe. Though OER research drew much attention and was advocated by a global society, there still are many challenges along with the opportunities that came up [15]. Because OER is not a single entity and a part of broad openness ecology, there is a need for developing a collaborative understanding in order to improve and advance OER movement.

In this regard, we kindly invite you to create a collaborative future OER research agenda and take actions accordingly. We want to identify and analyse conditions for the introduction of OER and the relevant factors, effects and impact of the publication, sharing, (re)usage, assembly, adaptation and hosting of OER and related processes and policies. There is a growing body of research on OER available in global collections such as the OER Knowledge Cloud (http://oerknowledgecloud.org). We aim to address all three educational research levels (micro, meso and macro) with a globally representative coalition and strive for mixed methods research combining quantitative and qualitative analyses to reach a holistic understanding [5]. Beyond creating a future OER research agenda, this paper calls open education and OER advocates to take local actions so that we can collectively make a global impact.

REFERENCES

[1] C. M. Stracke, S. Downes, G. Conole, D. Burgos, and F. Nascimbeni, "Are MOOCs Open Educational Resources? A literature review on history, definitions and typologies of OER and MOOCs," *Open Prax.*, vol. 11, no. 4, p. 331, 2019. DOI: 10.5944/openpraxis.11.4.1010.

[2] UNESCO, "Recommendation on Open Educational Resources (OER)," UNESC. Available: https://unesdoc.unesco.org/ark:/48223/pf0000373755

[3] UNESCO, UNICEF, The World Bank, and OECD, "What's Next? Lessons on Education Recovery: Findings from a Survey of Ministries of Education amid the COVID-19 Pandemic," Paris, New York, Washington D.C, 2021. Available: https://covid19.uis.unesco.org/wp-content/uploads/sites/11/2021/07/National-Education-Responses-to-COVID-19-Report2_v3.pdf

[4] C. M. Stracke *et al.*, "Responding to the Initial Challenge of the COVID-19 Pandemic: Analysis of International Responses and Impact in School and Higher Education," *Sustain.*, vol. 14, no. 3, 2022. DOI: 10.3390/su14031876.

[5] C. M. Stracke, "Quality Frameworks and Learning Design for Open Education," *Int. Rev. Res. Open Distrib. Learn.*, vol. 20, no. 2, Apr. 2019. DOI: 10.19173/irrodl.v20i2.4213.

[6] A. Bozkurt, S. Koseoglu, and L. Singh, "An analysis of peer reviewed publications on openness in education in half a century: Trends and patterns in the open hemisphere," *Australas. J. Educ. Technol.*, vol. 35, no. 4, 2019. DOI: 10.14742/ajet.4252.

[7] V. I. Marin *et al.*, "A comparative study of national infrastructures for digital (open) educational resources in higher education," *Open Prax.*, vol. 12, no. 2, pp. 241–256, Apr. 2020. DOI: 10.5944/openpraxis.12.2.1071.

[8] O. Zawacki-Richter *et al.*, "Elements of Open Education: An Invitation to Future Research ," *Int. Rev. Res. Open Distrib. Learn.*, vol. 21, no. 3, pp. 319–334, 2020. DOI: 10.19173/irrodl.v21i3.4659.

[9] O. Zawacki-Richter, W. Müskens, and V. I. Marín, "Quality Assurance of Open Educational Resources," in *Handbook of Open, Distance and Digital Education*. Singapore: Springer Singapore, 2022, pp. 1–19. DOI: 10.1007/978-981-19-0351-9_43-1.

[10] C. M. Stracke *et al.*, "Impact of COVID-19 on formal education: An international review on practices and potentials of Open Education at a distance." *The International Review of Research in Open and Distributed Learning*, to be published.

[11] V. Truong, T. Denison, and C. M. Stracke, "Developing Institutional Open Educational Resource Repositories in Vietnam: Opportunities and Challenges," *Int. Rev. Res. Open Distrib. Learn.*, vol. 22, no. 4, pp. 109–124, 2021. DOI: 10.19173/irrodl.v23i1.5582.

[12] A. Bozkurt, and C. M. Stracke, "The shift toward openness in education and the implications for learning ecosystems and ecologies," In M. Kerres, D. Otto, & O. Zawacki-Richter (Eds.), *Distributed Learning Ecosystems: Repositories, Resources and Practices*. Springer Nature, to be published.

[13] N. B. Colvard and C. E. Watson, "The Impact of Open Educational Resources on Various Student Success Metrics The Impact of Open Educational Resources on Student Success Metrics," *Int. J. Teach. Learn. High. Educ.*, vol. 30, no. 2, pp. 262–276, 2018.

[14] I. Jung, T. Sasaki, and C. Latchem, "A framework for assessing fitness for purpose in open educational resources," *Int. J. Educ. Technol. High. Educ.*, vol. 13, no. 1, 2016. DOI: 10.1186/s41239-016-0002-5.

[15] J. Hilton, "Open educational resources, student efficacy, and user perceptions: a synthesis of research published between 2015 and 2018," *Educ. Technol. Res. Dev.*, vol. 68, no. 3, pp. 853–876, 2020. DOI: 10.1007/s11423-019-09700-4.

Christian M. Stracke developed interdisciplinary competences and expertise in research and education and in leading large-scale projects (budgets over EUR 50 million) and research institutes and teams (200+ researchers). As internationally recognized expert and innovator and appointed ICDE Chair in Open Educational Resources (OER), he published over 150 scientific articles on his main research fields: Open education, technology-enhanced learning, competence building, impact assessment and educational policies. Currently, Christian is Coordinator for Virtual Collaboration at the University of Bonn, appointed Advisory Professor at East China Normal University in Shanghai, and Adjunct Professor at Korea National Open University in Seoul. His twitter: @ChrMStracke

Rory McGreal is a professor in the Centre for Interdisciplinary Studies at Athabasca University (AU), Alberta Canada. He is also the UNESCO/International Council for Open and Distance Education Chair in Open Educational Resources and Director of the Technology Enhanced Knowledge Research Institute (TEKRI). In addition, he is the Editor-in-Chief of Canada's first open access journal, *The International Review of Research in Open and Distributed Learning (IRRODL)*. As part of his work as a Chair in OER, he has been responsible for creating the *OER Knowledge Cloud*, a database of scholarly articles and reports related to OER. He is the recipient of several international awards, conducted workshops in more than 60 countries, and been an invited speaker in more than 40.

Aras Bozkurt is a researcher and faculty member in the Department of Distance Education, Open Education Faculty at Anadolu University, Turkey. He holds MA and PhD degrees in distance education. Dr. Bozkurt conducts empirical studies on distance education, open and distance learning, online learning, networked learning, and educational technology to which he applies various critical theories, such as connectivism, rhizomatic learning, and heutagogy. He is also interested in emerging research paradigms, including social network analysis, sentiment analysis, and data mining. He shares his views on his Twitter feed @arasbozkurt

Olaf Zawacki-Richter is a professor of educational technology at the University of Oldenburg in Germany. He is the Dean of the Faculty of Education and Social Sciences and Director of the Center for Open Education Research (COER). Olaf has over 25 years of professional experience in the field of open, distance, and digital education. He has authored over 180 publications and served as invited keynote speaker, chair, and reviewer at many international conferences. Together with Professor Insung Jung (Japan), he is currently editing the Handbook of Open, Distance, and Digital Education in Springer's Major Reference Series (open access). His publications are available on ResearchGate and GoogleScholar. Twitter: @Zawacki_Richter