Open Educational Resources (OER) in E-learning for Higher Education

Judith Gisip[1], Norazura Ibrahim[2*], Suzana Ratim[3],
Fazni Susila Abdul Ghani[4]

[1]*School of Industrial Technology, Faculty of Applied Sciences,*
Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
judith@uitm.edu.my
[2]*School of Industrial Technology, Faculty of Applied Sciences,*
Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
noraz371@uitm.edu.my
[3]*School of Physics & Materials Studies, Faculty of Applied Sciences,*
Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
suzanar@uitm.edu.my
[4]*School of Chemistry & Environment Studies, Faculty of Applied Sciences,*
Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
fazni542@uitm.edu.my
*Corresponding Author

Abstract: *Open Educational Resources (OER) are educational materials that are freely accessible, openly licensed, and available for educators, learners, and the general public to use, share, and adapt. These resources can include a wide range of content, such as textbooks, lecture notes, videos, quizzes, simulations, lesson plans, and more. E-learning refers to the process of acquiring knowledge, skills, or information through digital technologies, typically delivered over the internet or through digital platforms. It involves the utilisation of various forms of electronic media and digital tools to*

facilitate learning and education. E-learning can take various forms such as online courses, virtual classrooms, webinars and interactive modules. The concepts can be configured as strategies to improve the quality of the curriculum in higher education institutions. The use of OER in e-learning is perceived by students as something interesting that can help them achieve a better understanding of various topics. This paper describes the characteristics of OER in e-learning, how OER are utilised within the context of e-learning, the benefits of using OER in e-learning, as well as the challenges to consider. Incorporating OER into e-learning has the potential to transform education, offering a promising approach to various platforms' access to education, reducing costs, promoting collaboration, and fostering innovative teaching and learning experiences. As time progresses, the development of OER has proven beneficial and continues to drive growth within the education sector.

Keywords: *Accessible Education, Collaborative Learning, E-learning, Higher Education, OER*

1. INTRODUCTION

Open Educational Resources (OER) represent a transformative paradigm shift in education, harnessing the power of digital technologies and open sharing to revolutionize how knowledge is created, shared, and accessed. OER encompass a vast array of freely available and openly licensed educational materials, including textbooks, videos, lecture notes, interactive modules, and more (Atkins et al., 2007). These resources (as shown in Fig. 1) are designed to break down barriers, democratize learning, and foster a global community of educators, learners, together with creators.

The main concept, OER embody the principles of openness, collaboration, and accessibility. The OER materials are accessible to anyone with an internet connection, irrespective of geographical location or financial constraints (Bossu et al., 2012; Conole, 2012; Hockings et al., 2012). Open licenses, such as Creative Commons licenses, empower educators and content creators to share their work while retaining certain rights, enabling customisation, remixing, and adaptation to suit diverse educational needs. The rise of OER signifies a departure from traditional educational models,

ushering in a new era of dynamic and interactive learning experiences. Educators can tailor OER to align with their teaching styles, adapting resources to engage students effectively. Furthermore, OER foster collaboration among educators and learners, encouraging the creation of shared learning materials and the exchange of innovative teaching practices. In this digital age, OER present an unparalleled opportunity to enhance education's accessibility, quality, and relevance. Exploring the realm of OER, is a discovery method with the potential for enriching learning journeys, cultivating collaboration, and unlocking education for all is uncovered.

E-learning, the innovative frontier of education, is redefining the way knowledge is imparted and acquired in the digital age. With the proliferation of digital technologies and the internet, e-learning has emerged as a dynamic platform that transcends traditional classroom boundaries. This transformative approach harnesses the power of electronic media and online connectivity to facilitate learning experiences that are flexible, accessible, and personalised.

E-learning encompasses a spectrum of educational activities conducted over digital channels, ranging from interactive online courses to virtual classrooms and multimedia-rich modules. This mode of learning caters to a diverse array of learners, from students seeking formal education to professionals aiming to upskill or retrain.

The COVID-19 pandemic had a profound impact on higher education, and e-learning emerged as a critical response to the challenges posed by widespread lockdowns and social distancing measures. E-learning became a lifeline for higher education institutions, allowing academicians to ensure the continuity of education when physical classes were no longer feasible. It enabled students to continue their studies without significant interruptions. E-learning platforms such as UFUTURE (for Universiti Teknologi MARA (UiTM) courses) facilitated the transition to remote learning, allowing students and educators to connect virtually, access course materials, and participate in lectures and discussions from the safety of their homes. Educators had to quickly adapt to e-learning, prompting institutions to provide training and support for faculty members in utilising digital tools effectively. Educators also need to explore innovative teaching

methods to engage students online, incorporating multimedia resources, interactive activities, and virtual simulations. The sudden shift to e-learning compelled both educators and students to develop and enhance digital skills, contributing to improving digital literacy and adaptability. Currently, many institutions are considering hybrid learning models that combine in-person and e-learning components, allowing for more flexibility and adaptability in the post-pandemic educational era.

The key essence of e-learning lies in its adaptability. Learners can engage with educational content at their own pace, accessing resources and lessons from virtually anywhere with an internet connection. The interactive nature of e-learning fosters engagement, critical thinking, and collaboration, while also catering to various learning styles through multimedia elements and interactive assessments.
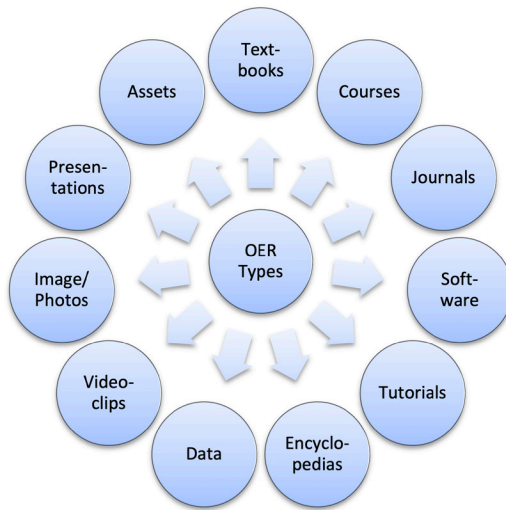

Fig. 1 OER Types by Content (Barneva et al., 2018)

2. CHARACTERISTICS OF OER IN E-LEARNING

Open Educational Resources (OER) in e-learning refer to freely accessible and openly licensed educational materials that are available online for educators and learners to use, share, and adapt. These resources are designed to enhance the quality of education by removing barriers to access which allows educators to customize learning materials according to their specific needs. OER in e-learning encompass a wide range of content, including textbooks, videos, lecture notes, assignments, quizzes, interactive simulations, and more. In the context of e-learning, OER offer several distinctive characteristics that make them valuable for online education:

- Open Access: OER are freely available to anyone with an internet connection. This accessibility eliminates financial barriers that might otherwise prevent learners from accessing educational materials.
- Permissions for Reuse and Adaptation: OER typically come with licenses that allow users to modify, adapt, and customize the content to suit their specific educational needs. This flexibility enables educators to tailor materials to their teaching methods and students' learning preferences (Wiley et al., 2014).
- Digital Format: OER are primarily designed for various digital platforms and devices, making them well-suited for e-learning environments. Learners can access these resources from their computers, tablets, or smartphones, enabling flexible and self-paced learning. This is especially important for online and remote learning environments.
- Diverse Formats: OER can encompass a wide range of formats, including text documents, multimedia (videos, audio recordings, images), interactive simulations, quizzes, presentations, and more. This diversity accommodates various learning styles and preferences.
- Global Collaboration: OER encourage collaboration and sharing among educators, institutions, and learners worldwide. Multiple educators, subject matter experts, and even learners can contribute to the creation and improvement of OER materials. This collaborative nature can lead to richer and more diverse resources.

- Quality and Peer Review: While OER are often created by educators, experts, and enthusiasts, many undergo peer review processes to ensure their accuracy, relevance, and educational value. This quality assurance enhances the credibility of OER for teaching and learning.
- Multilingual Support: OER can be created and translated into multiple languages, facilitating access and engagement for learners from diverse linguistic backgrounds.
- Easy Distribution: OER can be easily shared and distributed through online platforms, repositories, and learning management systems. This simplifies the process of finding, accessing, and using relevant resources.
- Cost Savings: By using OER, educators and learners can avoid the high costs associated with purchasing traditional textbooks and proprietary learning materials, making education more affordable and accessible (resulting in significant cost savings for students and educational institutions). No more expenses as in physical learning sessions such as traveling and utility bills due to the usage of a physical venue.
- Lifelong Learning: OER support lifelong learning by providing accessible and relevant educational resources for learners of all ages and backgrounds.
- Global Reach: OER can be accessed by learners worldwide, allowing educators and students to benefit from a global pool of knowledge and expertise.
- Innovation and Experimentation: The open nature of OER encourages educators to experiment with new teaching methods, tools, and approaches, fostering innovation and continuous improvement in e-learning.
- Sustainability: The contents in OER can be continually updated and improved based on feedback from educators and learners, ensuring that the content remains relevant and up-to-date.

These characteristics collectively define the dynamic nature of OER in e-learning, enhancing the quality, accessibility, and inclusivity of digital education. In summary, the characteristics of OER in e-learning include their openness, flexibility, digital nature, collaborative nature, diversity of formats, and potential to revolutionize education by making high-quality learning resources available to a global audience.

2.1 BENEFITS OF USING OER IN E-LEARNING

Using OER in e-learning offers several benefits that can enhance the quality of education and improve learning experiences. Here are some key advantages of incorporating OER into e-learning:

- Cost Savings: No fees are required as OER are freely accessible, eliminating the need for students to purchase expensive textbooks and course materials. This significantly reduces financial barriers and makes education more affordable (Amarneh et al., 2021; Olcott Jr, 2012).
- Access and Equity: OER promote equal access to education by providing free, open resources. Learners from diverse backgrounds, including those with limited financial resources, can access quality learning materials (Butcher, 2015).
- Customization and Adaptation: Educators can customize OER to match their teaching goals, curricula, and the needs of their students. This adaptability leads to more relevant and engaging learning experiences.
- Innovation in Teaching: OER encourage educators to experiment with new teaching methods, incorporate multimedia content, and engage students through interactive materials. Students and educators can combine ideas for innovation in the OER learning experience that can enhance the learning process.
- Global Collaborative Learning Community: OER able to create collaboration among educators, students, and institutions globally to access shared resources and expertise, and facilitating cross-cultural learning experiences. The knowledge can be shared, modified, and improved collaboratively. Producing a global community of contributors with open practice.

- Updated and Relevant Content: OER can be updated quickly to reflect the latest information and developments in a field. This ensures that learners have access to up-to-date and relevant content (Amarneh et al., 2021).
- Lifelong Learning: OER support continuous learning by providing resources that individuals can use throughout their lives to acquire new skills and knowledge.
- Adaptive Learning: Some OER platforms use data analytics and technology to adapt content to individual learning styles and progress, leading to personalised learning experiences.
- Flexibility and Self-Paced Learning: OER allow learners to study at their own pace and convenience. They can revisit materials, pause, and review content as needed.
- Reduced Environmental Impact: As digital resources, OER have a smaller environmental footprint (Amarneh et al., 2021).
- Professional Development: OER provide educators with opportunities for continuous professional development, allowing them to explore and adapt new teaching resources and methodologies in various ways such as able to create networking in the community having the same interest.
- Enhanced Critical Thinking: OER often encourage active engagement with materials, which can stimulate critical thinking and problem-solving skills. Such as creative thinking "out of the box" can be enhanced with the aid of versatile engaging materials via OER.
- Demonstration of Teaching Expertise: Educators who create and share OER can showcase their expertise to a global audience, enhancing their professional reputation. A demonstration can encourage more educators, learners, and people with similar interests to expand effective learning.

Incorporating OER into e-learning has the potential to transform education, making it more inclusive, collaborative, and accessible to learners of all backgrounds. However, careful planning, ongoing evaluation, and a commitment to quality are essential to maximising the benefits of OER in e-learning environments.

2.2 CHALLENGES TO CONSIDER

OER have the potential to revolutionize education by making learning materials more accessible, affordable, and adaptable. However, several challenges for colleges and universities need to be considered when integrating OER into educational practices:

Quality Assurance: The quality of OER can vary significantly. Not all OER may meet the required quality standards (Wang & Towey, 2017). It is important to ensure that the resources selected are accurate, up-to-date, and pedagogically sound. Educators need to invest time in evaluating and selecting resources that align with their educational goals. Ensuring the quality of OER can be a challenge, as there is a wide range of resources available, varying in accuracy and reliability.

Licensing and Copyright: OER are typically published under various open licenses, such as Creative Commons licenses. Educators need to understand these licenses to ensure they are using OER appropriately and respecting copyright restrictions (Bossu et al., 2012; Caswell et al., 2008). Mixing OER with proprietary content can also create licensing complexities.

Sustainability: OER development and maintenance require ongoing resources and support. If an institution wants to create its own OER, it needs to consider the costs associated with content creation, updating, and technical support. Additionally, OER repositories need ongoing management to ensure links and resources remain accessible (Wiley et al., 2014).

Technical Infrastructure: Accessing and utilising OER may necessitate robust technical infrastructure, particularly in areas where geographical location affects internet signal and coverage. Educators and students should have access to suitable devices and reliable internet connections to maximize the advantages of OER. Compatibility issues and technical glitches have the potential to impede adoption. Additionally, limited digital literacy can pose a barrier for individuals and institutions with restricted technological resources or skills (Paudel, 2021).

Technical Competence: Some learners might face challenges in navigating digital platforms and utilising OER effectively. Both educators and learners need to be comfortable with digital tools and platforms to effectively use and interact with OER (Freeman, 2005). Lack of experience in this poses challenges, often reducing a teacher's motivation to use OERs (Allen & Seaman, 2016).

Institutional Support: Incorporating OER into the curriculum may require changes in institutional policies, practices, and procedures. Adequate support, training, and incentives for educators are essential for successful integration (Wang & Towey, 2017).

Pedagogical Adaptation: OER materials might not perfectly align with an institution's existing curriculum or teaching methods. Educators need to be prepared to adapt and customize OER to suit their instructional goals and the needs of their students (Huang et al., 2020). Effective use of OER often requires proper integration into teaching practices. Educators might need training and support to effectively integrate OER into their curriculum and instructional methods (Dinevski, 2008).

Lack of Awareness: Educators and students might not be familiar with the concept of OER or how to find and use effectively (Mtebe & Raisamo, 2014; Olcott Jr, 2012; Seaman & Seaman, 2017). Training and awareness campaigns are necessary to promote the benefits of OER and how to use them.

Cultural and Linguistic Diversity: OER may not always take into account cultural, linguistic, or contextual differences. OER can come from various sources and cultural contexts. Content that is not relevant to the local context might not effectively engage learners or address their needs. It is important to consider the cultural relevance and linguistic appropriateness of OER for diverse learners. The majority of OER content at present remains mostly English-language based and global-north dominated. There is a danger of a future digital divide created by language barriers and culture-specificity (Karunanayaka & Naidu, 2018; Mtebe & Raisamo, 2014).

Changing Technology: As technology evolves, the formats and platforms for delivering OER might change. Ensuring that OER remain accessible and functional as technology advances can be a challenge (Amarneh et al., 2021). Integration with Assessment: Traditional assessment methods might not align with the more interactive and collaborative nature of some OER. Educators need to think creatively about how to assess student learning effectively when using OER (Amarneh et al., 2021). Incorporating OER into formal education might raise questions about assessment and credentialing. How can learning outcomes be evaluated when resources are diverse and adaptable?

Resistance to Change: Introducing OER might face resistance from educators who are comfortable with traditional materials or who perceive OER as lower in quality. Addressing these concerns and highlighting the benefits is crucial. Some educators and institutions might be resistant to adopting OER due to concerns about the quality and reliability of freely available resources.

Long-Term Planning: OER implementation should be part of a well-thought-out long-term strategy. Institutions need to consider how OER fit into their overall educational goals and how to evolve alongside changing pedagogical practices.

Collaboration and Community: Building a community around OER, where educators can share insights, best practices, and resources, can enhance the effectiveness of OER adoption. However, fostering such collaboration can be challenging (McBride & Abramovich, 2022).

Funding and Incentives: Developing high-quality OER and supporting their adoption require funding and incentives (McBride & Abramovich, 2022). Absence of proper funding mechanisms, the growth and sustainability of OER initiatives can be hindered (Wang & Towey, 2017).

In summary, Fig. 2 illustrates a general framework depicting challenges related to OER. These challenges are categorized into five dimensions. Despite these challenges, OER offer significant potential to democratize education and make learning resources more accessible to a global audience. In addressing these challenges, collaboration among educators, institutions, administrators, policymakers, content creators, instructional designers, and technical support teams can play a key role in successful OER integration. It is important to approach OER implementation with careful planning, adaptability, and a commitment to enhancing educational access and quality.

Fig. 2 Challenges of Using OER

3. CONCLUSION

OER are reshaping the educational landscape by making quality learning materials accessible to all. Incorporating OER into e-learning has the potential to transform education, offering a promising approach to expanding access to education, reducing costs, promoting collaboration, and fostering innovative teaching and learning experiences. Despite some of the current limitations or weaknesses of OER, their use is likely to grow, simply because it makes no sense to create everything from scratch when good quality materials are freely and easily available. While challenges exist, the benefits of OER adoption continue to drive the growth of this movement within the education sector. Indeed, OER will prove to be one of the essential features of teaching in a digital age.

4. ACKNOWLEDGEMENTS

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