

From the Implications of Open Education for Teachers to the Design of A Self-evaluation Tool for Open-Only Blended Instruction

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Abstract: Integrating open educational resources into blended learning courses or online instruction poses considerable challenges for teachers, particularly when using open-only resources. These include navigating through a multitude of resources, incorporating them into the curriculum, addressing copyright concerns, or collaborating with librarians or IT professionals. This becomes especially important in cases of teachers' collaboration across multiple organizations, whether for legal, technological, cultural, or pedagogical reasons. To address this challenge, we have developed an instrument to help teachers engage in designing open-only blended learning instruction. A five-phase process is proposed. It starts with a comprehensive inventory of scientific knowledge and ends with validation of an instrument. To begin, extensive reviews of the literature were conducted, specifically focusing on the impact of open educational resources (OER) on teachers in blended learning environments. This allowed us to precisely outline the roles and responsibilities of teachers who adopt OER. Subsequently, advanced artificial intelligence was used to facilitate the development of a self-evaluation tool. To ensure its theoretical soundness, all these findings are cross-referenced to create the instrument. A Delphi method and future ecological tests will be performed to validate the instrument before proper dissemination. The instrument—we called SATOB (Self-Assessment Tool for Teachers in Open-resource-only Blended Learning), consists of four parts: planning and preparation; blending instructional strategies; open education; reflection, improvement and sharing. It contains twenty self-evaluation questions and a scoring system with recommendations for professional development. The instrument was created to facilitate the process of teacher self-regulation to assess the extent to which a course is open resources only and well integrated into a blended instruction design. In the long term, once the tool becomes empirically validated, teachers and institutions committed to open science and open education can use it. However, further research is still necessary.

Keywords: OER, Blended Learning, Self-evaluation, SLR, DELPHI Method

1. Introduction

With the promotion of Open Science, open access and open data have policies and practices usually in place. Despite this, open educational resources (OER) are not as widely used as they could be due to various barriers (Gutnecht et al., 2020), such as a lack of knowledge that holds teachers back (Otto, 2021), institutional and legal issues regarding rights to the resources created (Mishra, 2017), and a lack of incentives (Belikov et al., 2016). Open education is propelled by two interconnected and complementary goals: sharing and quality (Leonelli, 2023). The former embodies a horizontal dynamic that contributes to the latter. Indeed, sharing promotes exposure, which facilitates constructive feedback. Nevertheless, these two purposes raise substantial challenges for teachers. For example, sharing involves copyright management and clarifying the target audience of the developed resource. Therefore, it can be difficult to include OER in teaching, especially within a blended learning design where sharing resources is done alongside teaching.

One of the authors experienced the challenges of designing open-blended courses firsthand. As colleagues from different universities offered similar courses, we decided to collaborate. However, practical constraints made this very difficult. Some colleagues had not taken care to include only royalty-free resources, legally limiting sharing between universities. Others had failed to consider the technical limitations of their colleagues, such as the absence of certain features in one of the learning management systems, which made incorporating OER technically complicated. Finally, once other colleagues complied with the technical and legal frameworks for inter-university collaboration, the resource was perceived as not sufficiently attractive to students. This highlights the complexity of committing to open resources and inter-institutional sharing. To facilitate interinstitutional teaching collaboration, it was deemed essential to develop tools to support instructors in designing open-only blended learning.

To achieve this objective, we have thoughtfully crafted a three-step strategy. First, we undertook a systematic literature review (SLR) to pinpoint the challenges that teachers face when using and creating OER. Next, using generative AI, we developed a suite of self-evaluation tools for teachers to evaluate their instructional design, their creation/use of open resources, and the integration of these resources into blended learning. We then confronted the results to design the self-evaluation instrument. Ultimately, we present a brief description of the Delphi technique that will be employed before ecological tests to evaluate, regulate and validate the self-evaluation instrument.

2. Literature Review

As Otto (2022) states, the concept of OER is generally well understood in academia. However, their implementation is often inconsistent. While some studies have examined the connection between open resources and the quality of education, their underutilization remains a concern (Ofoegbu et al., 2021). Certainly, policies, financial or technical barriers at the institutional level may be at play. However, the additional workload and tasks for teaching staff may also be contributing factors. Nevertheless, open resources are a relevant lever that can help promote the sustainability of education (Zaid & Alabi, 2021). Studies show that OER facilitates connections between teachers from different institutions, generating a new “space for learning” (Baas et al., 2023, p. 6053). This leads to collaboration, debate, and mutual assistance. Proper use of OER can also improve learning quality (Luo et al., 2020). Ultimately, when coupled with open educational pedagogy, it contributes to enhancing the students’ learning journey (Miller et al., 2021) by encouraging them to be more proactive learners.

OER are resources for teaching and learning that offer a wide range of possibilities for use (Wiley et al., 2018, p. 134): retain, reuse, revise, remix, and redistribute. The development of OER is possible with a variety of funding models (Zaid & Alabi, 2021), for example membership, donations, contributor-pay, or sponsorship. It certainly requires skills (Robert & Youga Dieng, 2016). Finally, teachers’ familiarity with open resources was structured from simple exposure to deliberate selection (Cox & Trotter, 2017).

When integrated into a blended learning design, OER brings new obstacles. For instance, there is the need to define the instructional design before distributing the open materials and allowing other teachers to reuse them (Mullens & Hoffman, 2023). Yet another example is the essential partnership with fellow professionals, such as librarians and IT experts (Moore & Reinsfelder, 2020). While this task certainly brings professional satisfaction and quality in the resources created, it requires a significant amount of work time. Could we develop a more comprehensive inventory of the consequences for teachers of committing to embracing open education? The objective of this study is to compile a comprehensive list of the consequences that open-resources-only blended learning design would have on the teaching profession.

3. Implications for Teachers Committed to OER—Materials and Methods

To document the implications for teachers when committing to OER, a rather innovative systematic literature review (SLR) was conducted that combined the classic PRISMA flow diagram (Page et al., 2021) with an AI-supported process (via *SciSpace* <https://scispace.com/>). This approach was selected due to the complementary nature of the methods (one is transparent, the other generative) and the fact that the initial article extractions reveled distinct lists. One could no longer ignore the two parallel processes.

3.1 A Systematic Literature Review

The SLR was conducted through a comprehensive search of relevant articles in *Web of Sciences*, *ERIC* (via *Ovid SP*), and *PsycINFO* (via *EBSCOhost*). The search terms—via the thesaurus—used to extract articles included “open educational resources,” “OER,” “teach*,” and “methods” (see Figure 1). On the left, the identification and extraction process, which complies with the PRISMA statement, shows the transition from 147 scientific articles identified in the databases to 10 scientific articles selected. The removal of duplicates, then of articles whose title and abstract explicitly indicated another subject of study, and finally the retention of only those that meet the eligibility criteria, transparently explains the reduction in the number of articles selected. On the right, the transition from the first 200 articles proposed by *SciSpace* to the 130 articles selected for analysis by generative AI is explained (13 duplicates with SLR, 10 in foreign languages, and 45 not retrieved because of paywall or other motives). Subsequently, the visual guide demonstrates that the 130 articles were scrutinized by generative AI.

Notably, the same articles seldom recur in both instances. This suggests that the selection of the two complementary methods (PRISMA and AI) was judicious, instilling trust in the thoroughness of the article selection.

3.2 Results From AI-Supported SLR

After extracting the first 200 SciSpace articles (prompt: “What are teachers really doing with OER and what are the tasks they are doing to make proper use of these resources?”) and following the process described in Figure 1—column B, the 130 remaining articles were submitted to *DeepSeek-R1-Distill-Llama-8B* via *GPT4ALL* v3.10.0, with the following prompt: “Based on these 130 documents, what are teachers actually doing with OER? Provide a comprehensive inventory of all the tasks identified in these 130 documents. The DeepSeek output has listed 11 tasks (Figure 2, which is now presented without the lengthy introduction that preceded the list).

If DeepSeek’s tasks 3 and 11 are similar, it makes 10 propositions based on the 130 articles. For example, teachers involved in open education must identify and modify resources, create new materials, select and organize them, incorporate them into their instruction, and disseminate and share these lessons. Moreover, they should participate in training on OER, engage in professional networks, evaluate the impact of open resources on teaching and learning quality, and stay up to date with the latest developments in open education. Some of these tasks may be subject to debate. Integrating resources into teaching is not exclusively the domain of OER. Similarly, participating in learning communities is primarily a matter of professional growth rather than a requirement of open education. However, this collection of articles highlights the additional effort required to engage with open resources, which should not be underestimated.

3.3 Open Resources and Teachers’ Workload

After examining the two SLRs, we were able to clearly define the responsibilities related to the use of OER. We compared the list presented in Figure 2 with the practices documented in Table 1, to produce Table 2. This table has been divided into three sections that reflect the impact of open education on teachers: “cross-cutting implications,” “implications when reusing OER,” and “implications when creating OER.” These three categories are practical and enable actions to be considered.

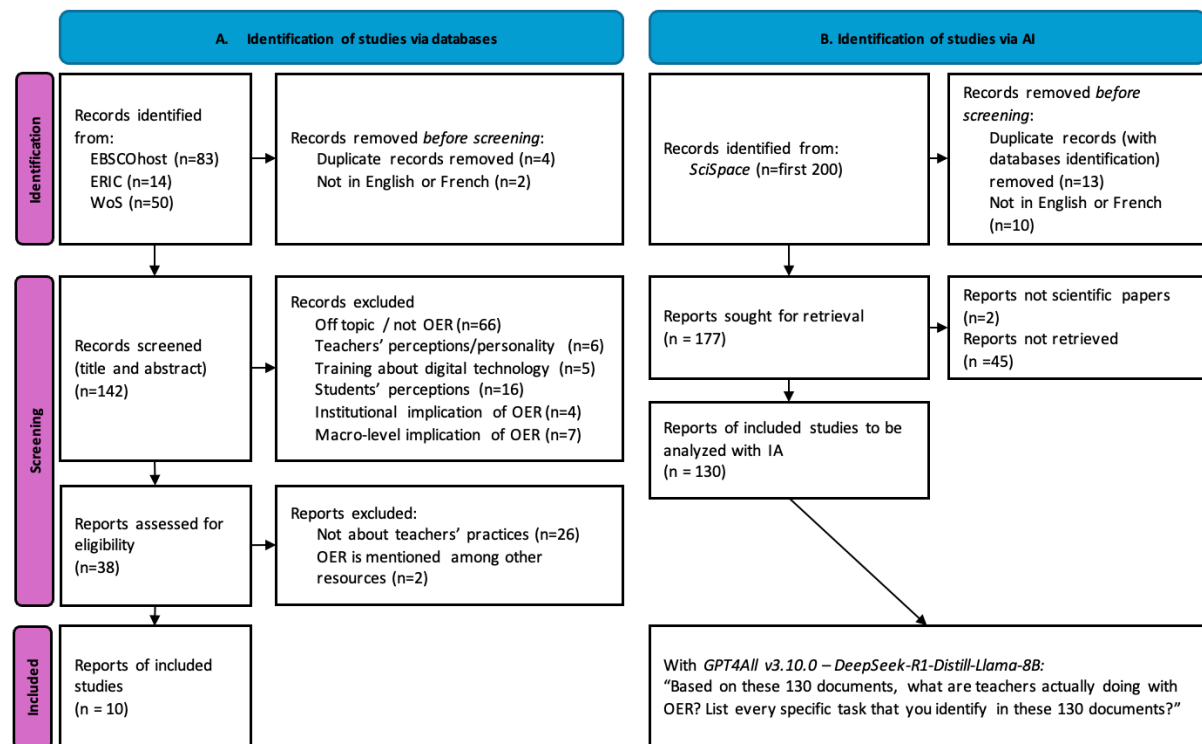


Figure 1: Adapted PRISMA diagram to include a double literature review (classical + AI-supported)

Table 1: Included studies documenting teachers' practices and requirements when using OER.

Author, Date	Context (Country)	Methods	Documented Teachers' Practices
(Al-Zahrani, 2024)	Faculty members of the University (Saudi Arabia)	Online survey	- Use of various technologies - Request support
(Bradshaw et al., 2024)	Human rights course using OER for young adults (Ghana)	Qualitative interviews	- Adopt new concepts (e.g., openness) - Search for OERs - Collaborate with other teachers
(Dashtestani & Suhrawardi, 2023)	English as a foreign language for adults (Iran)	Mixed-method approach (survey and semi-structured interviews)	- Deal with uncertainty (e.g., copyright) - Control equality, assess credibility, improve and update OERs - Develop digital literacy and OERs - Get training (quality, copyright, repositories, implementation...)
(Helton, 2024)	Cross-disciplinary science for K–12 teachers (USA-WV)	Design-based research (pre-, peri-, & post-interview, observations, & discussing outputs with participants)	- Sharing resources publicly - Deal with various concerns (e.g., exit the comfort zone, assume the perceptions of others, assess technical-pedagogical knowledge...)
(Gerard et al., 2022)	Science learning for secondary school (USA-CA)	Interviews and logged data	- Review instructional approach - Review OER (connect to students' lives, additional content, academic language help, clarify instructions, technical challenge reduction, ...)
(Lo et al., 2023)	Mathematics for secondary school (Hong Kong)	Qualitative (semi-structured interviews and written feedback) and quantitative (evaluative survey)	- Review OER (accuracy and visual appeal, alignment to standards, ease of use and support, ability to meet students' needs)
(Miller et al., 2021)	Calculus for university students (USA-OH)	Case study of institutional initiatives over 10 years	- Review of the whole instructional approach - Professional development for instructors - Large team collaboration
(Pulker & Kukulska-Hulme, 2020)	University Language teachers (UK)	Online questionnaire and interviews	- Reappropriation (gain ownership, adapt OER...) - Reflection (question the quality of OER and the instructional design) - Sharing in close spaces (gain confidence, identify specific students...)
(Love & Blankstein, 2024)	Various disciplines with college and university teachers (USA)	Survey across disciplines: humanities, social sciences, sciences, area studies, and medicine	- Examine and update instructional approach - Consult instructional designers, IT, or other support - Promote academic integrity - Collaborate with librarians - Understand copyright, intellectual property...
(Tlili et al., 2023)	Teachers from various University disciplines (Ghana)	Mixed methods (questionnaire and semi-structured interviews)	- Integrate technology - Search for, evaluate and modify OER - Develop and share OER

- (1) Accessing & Identifying: seek out OER that aligns with teaching subjects & student needs.
- (2) Adapting Resources: modify existing materials to suit individual lesson plans, curriculum requirements, or specific learning objectives.
- (3) Creating New Resources: develop original content using OER as a foundation, which may include creating lesson plans or multimedia elements.
- (4) Curating Collections: organize and select the available resources to compile collections judged useful for both students and colleagues.
- (5) Using OER in Teaching: incorporate OER into lessons to enhance learning experiences.
- (6) Recording & Sharing: create class recordings, share with students as study materials.
- (7) Attending Training: participate in workshops focused on the use of OER and its production.
- (8) Discussing Practices: engage in professional chats about practices associated with OER.
- (9) Researching Impact: conduct studies to evaluate how OER enhances teaching methods and improves student performance or engagement levels.
- (10) Continuous Learning: maintain knowledge by staying informed about new developments in OER.
- (11) Producing OER: create original content, lesson plans, interactive activities, videos, or other digital tools designed to meet specific educational needs.

Figure 2: Output of DeepSeek when prompted about teachers' additional tasks, based on the 130 retained documents

Table 2: Additional work for teachers resulting from their involvement in OER.

Categories	Additional Tasks
Cross-cutting implications	- Professional development and new concept adoption (e.g., copyright, intellectual property) - Collaborate with Librarians, IT, other teachers, or instructional designer - Integrate technology - Deal with pedagogical concerns (uncertainty, perceptions of others...) - Review instructional approach
Implications when reappropriating OER	- Search for and modifying open resources - Analyze the relevance of the resource for reappropriation (alignment with standards, suitability for students' needs, adjustment to location, modification of the vocabulary, assessment of integrity and credibility...)
Implication when creating OER	- Develop specific digital literacy - Clarify targeted student and learning goals - Gain confidence to sharing resources - Curate collection or work with institutional partners

4. Discussion

According to the literature, OER has barriers (Gutnecht et al., 2020), and one of these may be the increase in teachers' workload. With the SRL we conducted, an extensive list of additional tasks resulting from engagement with open education has been proposed. Its content might be of interest to universities or schools that are considering implementing an institutional policy on OER. They should not overlook the impact on teachers' daily activities, nor engage in open washing (Farrow, 2017).

Since our findings are based on SLR, every subsequent task was previously documented in scholarly articles. Due to the research approach, no novel findings could arise. For instance, the importance of teamwork with other professionals had already highlighted (Moore & Reinsfelder, 2020), as was the need for developing abilities crucial for involvement in open education (Robert & Youga Dieng, 2016). However, by integrating these elements, we can offer a comprehensive perspective on open science and the OER movement.

Therefore, the act of teaching with open educational materials can be classified into three distinct categories. The first—cross-cutting implications—encourages training institutions and teachers to familiarize themselves with the implications of open education: mastering new concepts such as copyright (Love & Blankstein, 2024),

facilitating interprofessional collaboration (Miller et al., 2021), reevaluating teaching methods (Gerard et al., 2022), and managing pedagogical instability (Dashtestani & Suhrawardi, 2023; Helton, 2024). The second aspect—implications when reappropriating open resources—is that universities and instructors must allocate time to locate and organize teaching materials (Tlili et al., 2023). They must also carefully examine these resources to determine their suitability for the educational context (Love & Blankstein, 2024). Modifying or adjusting them requires additional time and skills (Lo et al., 2023). The third aspect—implication when creating OER—highlights the important issues that teachers and institutions need to address when they want to participate in the dissemination of open resources. By taking part in training courses and engaging with communities of practice, individuals can acquire the essential skills (Miller et al., 2021). Resources should be made available to a targeted audience with clear learning objectives so that other people, whether teachers or students, can use them. Developing skills then becomes a lever for gaining confidence in sharing (Pulker & Kukulska-Hulme, 2020). Finally, everything related to content curation requires a significant amount of work. The framework in which OER can be made available must be delineated by negotiations between the institution and teachers (Love & Blankstein, 2024), to define the conditions under which OER can be made available.

Belikov et al. (2016) suggested that a lack of incentives might explain some teachers' hesitation towards open education. However, making OER mandatory has been documented as not preferred by the teaching staff (Otto, 2022). Therefore, we suggest an alternative incentive based on pedagogical values: the quality of education made possible thanks to self-evaluation. This approach to instrumental support is certainly of interest to teachers, since education quality is generally valued (Baas et al., 2023). Lack of involvement in OER could be due to a lack of skills (Bossu & Willems, 2024), whereas engagement for openness in education is often driven by quality (Pulker & Kukulska-Hulme, 2020). A self-positioning tool, which has been used to support teachers (Alvarez et al., 2021; López-Angulo, et coll., 2024), could help increase familiarity with OER, from awareness to willingness (Cox & Trotter, 2017).

5. Toward a Self-evaluation Instrument

No self-evaluation tool for teachers was identified during the search for scientific literature on open, blended learning. OBTRA (Los et al., 2021) offers a good starting point, but its objective is not self-positioning after instruction design, but rather measuring general readiness. Since no identified instruments, we chose AI-generated solutions to start designing the self-evaluation tool after some preliminary tests that seemed convincing. We keep in mind that this work is not sufficient on its own and must be tested and verified.

5.1 Consequently, we (1) Generated 3 Tools With AI, (2) Compared the 3 Propositions to Build a First Version, and (3) Compared This First Version With the Results Found in OER Implications for Teachers (Table 2) to Make a Theoretically Sound First Draft.

Using *Llama 3 8B Instruct*, 3 different instruments were generated using the following prompts:

1. "Imagine a teacher that designs a blended learning course using only open educational resources or creating open educational resources. Generate a self-evaluation tool that the teacher can use to analyze the quality of the open-resource-only blended learning design,"
2. "Imagine a teacher working in a university and wanting to offer blended learning to her students. In addition to that, she wants to use and generate open educational resources only so she can share her blended learning course. Can you generate a self-evaluation tool to help her analyze the quality of the blended learning design and the adequacy of the open educational resources use?"
3. "I am a teacher. I design a blended learning course. I want to create open educational resources and only use open resources for this blended learning course. Can you help me assess what I have done?"

Confronting the three outputs, two of the co-authors have prepared an initial version of the self-evaluation instrument following steps 1 to 6 proposed by DeVellis (2017) to examine the operationalization of the tool. The first version is available online (here: <https://www.doi.org/10.5281/zenodo.15431354>), but should not be used in its current form, as it is only a preliminary draft that requires further work.

5.2 Confronting First Instrument with OER Implications for Teachers

The first version of the document was confronted with the outcomes of the OER implications. Regarding the open education section, several elements identified were already given by the AI-supported development process and have been estimated as fully equivalent. For instance, "Integrate technology" (see Table 2) is

explicitly stated in B2 “Have I used a variety of digital tools and resources [...]” (see first draft), “Review instructional approach” is evident in B3 “Are my instructional strategies flexible enough [...]”, or “Clarify targeted students and learning goals” is specified in A1 “Have I clearly defined the learning objectives and outcomes [...]”.

However, four very important additional tasks for teachers when choosing OER (see Table 2) were estimated as being missing or insufficiently developed. For example, “Search for and modify OER” is absent from the first draft of the self-evaluation tool; an item needs to be added. It is similar for “Collaborate with librarians, IT, other teachers, or instructional designers,” for the “alignment with standards” in “Analyze the relevance of resources for reappropriation,” for “Curate a collection of work with institutional partners,” for “Gain confidence to sharing resources” and for “Professional development and new concept adoption.” Therefore, the following items have been added (see Figure 3).

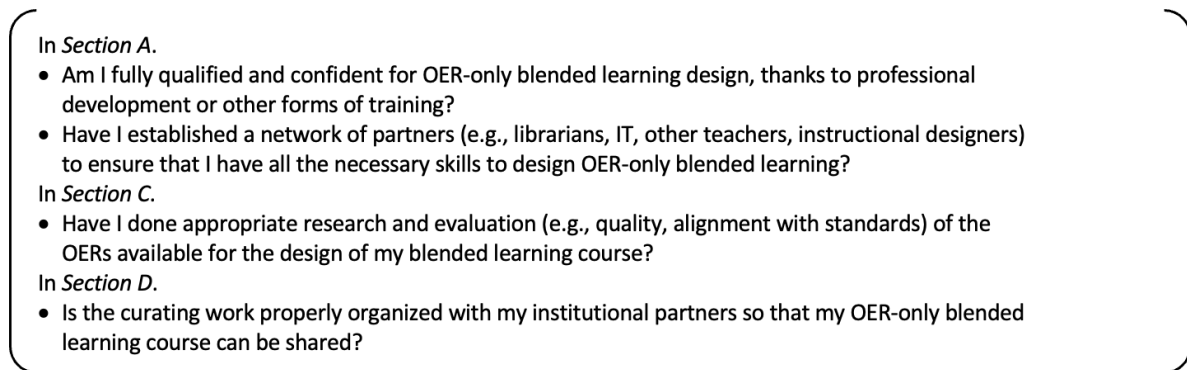
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- In *Section A*.
 - Am I fully qualified and confident for OER-only blended learning design, thanks to professional development or other forms of training?
 - Have I established a network of partners (e.g., librarians, IT, other teachers, instructional designers) to ensure that I have all the necessary skills to design OER-only blended learning?
 - In *Section C*.
 - Have I done appropriate research and evaluation (e.g., quality, alignment with standards) of the OERs available for the design of my blended learning course?
 - In *Section D*.
 - Is the curating work properly organized with my institutional partners so that my OER-only blended learning course can be shared?

Figure 3: Items added to the self-evaluation instrument, based on the results of the SLR

The second draft of the Self-Assessment tool for Teachers when designing Open-resource-only Blended learning (we call it SATOB, for a nod to satellite observation and the notion of monitoring one’s own practice as a teacher), is available here: <https://doi.org/10.5281/zenodo.15490129>. With a strong theoretical foundation, it is now crucial to put it to the test in practice.

6. Next Steps—Confront the SATOB

The instrument, as it is emerging from SLR, AI, and five researchers’ work, seems theoretically sound. However, it still needs validation. Since the tool is intended for self-evaluation, several methods are conceivable, from questionnaires to assess the clarity of items (Borg & Edmett, 2019), statistical tests to document the link with measured variables (Calancie et al., 2017), or a Delphi study (Lim & Antony, 2016). We intend to conduct the latter because “One of the major premises underlying the whole approach [Delphi technique] is the assumption that a large number of ‘experts’ judgments are required to ‘treat adequately’ any issue” (Linstone & Turoff, 1975, p. 22). Its application can serve concepts and framework development (Okoli & Pawlowski, 2004). In our case, it is especially interesting because of the Delphi technique “helps gauge the generalizability (external validity) or transferability of the findings” (Hasson & Keeney, 2011, p. 1701). Indeed, the self-evaluation instrument that has been created deserves scrutiny by experts, with the goal of refining it until a consensus is reached on its substance and form.

7. Conclusion

The primary objective of this research was twofold. Firstly, it aimed to explore the implications of OER for teachers. Secondly, it sought to create a tool to help teachers self-regulating after designing blended instruction with OER. Two SLRs were conducted to document teachers’ implications when using OER (one traditional, following the PRISMA process, and the other using generative AI). Three self-evaluation tools were generated using AI. The findings were compared to create an instrument that teachers can use. However, before introducing it to real-world scenarios, it must first be evaluated by experts using the Delphi method.

Our study aligns with previous findings (Otto, 2022) that suggest that educators do not favor mandatory OER. Instead, they prefer incentives and assistance to participate in this initiative of open education, which appears to be broadly supported. Moreover, OER may align more closely with open pedagogy, facilitating its adoption (Tang et al., 2021)—even if open resources are necessary for implementing open pedagogy (Arispe et al., 2023)—but that would require a clear and explicit policy that promotes openness in teaching, as well as

professional development and dedicated time for redesigning instruction (Miller et al., 2021). This is particularly important when designing and creating OER for online or blended learning rather than for face-to-face instruction (Ofoegbu et al., 2021).

The two parallel and complementary extractions from scientific literature indicated that teachers' work is undergoing change because of their commitment to open education. The aforementioned factors have been classified as "cross-cutting implications," "implications when reappropriating OER," and "implications when creating OER."

Open education is a political project in the field of education to which teachers generally agree. However, they may require guidance in incorporating this openness-centric approach into university settings and other educational institutions. The self-evaluation instrument that is currently being designed has the potential to contribute to this support.

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