

# The evolution of open pedagogy in higher education: a bibliometric perspective

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## Abstract

**Purpose** – This study aims to synthesize and visualize the comprehensive landscape of open pedagogy (OP) in higher education (HE) from 1988 to 2024, based on data from the Scopus database.

**Design/methodology/approach** – The study followed the PRISMA 2020 protocol for literature screening and employed a combination of bibliometric and qualitative content analysis to examine 79 publications on OP.

**Findings** – The evolution of OP can be divided into three main phases: (1) 1980–1994, marked by early studies in the context of distance education, (2) 1995–2015, during which foundational theoretical frameworks emerged and (3) 2016–2024, characterized by a sharp increase in publications. Most research is concentrated in Western countries, primarily the USA, Canada and the United Kingdom, with journal articles accounting for the majority of publications (84%). This trend underscores the need for further exploration in more diverse global educational contexts. David Wiley is the most cited scholar (193 citations), while Virginia Clinton-Lisell has contributed the highest number of publications, with six. Keyword analysis reveals three major thematic clusters reflecting current research directions: (1) the theoretical and philosophical foundations of OP, (2) pedagogical strategies and learner experiences and (3) the impact of OP on HE.

**Originality/value** – This study represents the first comprehensive effort to integrate bibliometric methods with qualitative analyses to examine the evolution, philosophy and conceptual development of OP. The resulting visualized insights offer a multilayered perspective on the field's development and provide a valuable foundation for educators and researchers to further advance the open education movement.

**Keywords** Open pedagogy, Higher education, Bibliometric mapping analysis, Visualization

**Paper type** Research article

## Introduction

The rapid development of information and communication technologies has enabled diverse digital platforms for sharing learning resources, enhancing accessibility and supporting the growth of the open education movement. This movement aims to expand learning opportunities and promote more progressive, inclusive pedagogies. In this context, UNESCO has played a key role in advancing open educational resources (OER), notably through the 2002 Forum on the impact of open courseware for higher education (HE) in developing countries. However, research increasingly shows that simply providing OER is insufficient to improve educational outcomes. Studies suggest that the effectiveness of OER depends less on the resources themselves than on how they are pedagogically used (Baran and AlZoubi, 2020; Olcott, 2012). This limitation has led to the emergence of open educational practices (OEP), which emphasize integrating OER into innovative teaching and learning strategies (Hegarty, 2015). OEP highlights the importance of embedding OER within pedagogical frameworks (Tuomi, 2013), yet it has been criticized for not fundamentally challenging traditional models of education. A narrow focus on OEP, without a broader educational vision, may result in inconsistencies and difficulties in scaling open education

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initiatives (Tietjen and Asino, 2021). To address these limitations, the concept of open pedagogy (OP) has emerged as a more comprehensive educational philosophy for the digital age. OP extends beyond the use of OER by emphasizing learner-centered approaches, collaboration and equity in knowledge creation and sharing. With increasing attention on designing inclusive and effective learning environments, OP is gaining recognition as a transformative approach in HE. Recent studies have attempted to clarify its conceptual boundaries and develop analytical frameworks for evaluating its implementation (Chen and Hendricks, 2023; Werth and Williams, 2021). Nevertheless, the diversity of definitions and interpretations continues to pose challenges for research, comparison and evaluation (Clinton-Lisell and Kelly, 2024a).

Accordingly, this study aims to provide a comprehensive and systematic overview of OP research in HE from 1988 to 2024. While prior bibliometric studies have explored related areas such as OER (Wang *et al.*, 2017; Zancanaro *et al.*, 2015) and OEP (Tlili *et al.*, 2021), no study to date has specifically focused on OP using the Scopus database to map the intellectual landscape of the field. It addresses the following research questions: (1) the evolution of publication output over time, (2) the distribution of publications by document type, country and institution, (3) the most influential authors and citation patterns, (4) frequently co-occurring keywords and (5) emerging trends, opportunities and challenges shaping OP in HE.

### From OER to open pedagogy: foundations and trajectories

The emergence and development of OP are shaped by the interplay of evolving educational philosophies, technological advancements and societal needs. Its intellectual roots can be traced to early educational thinkers such as Comenius, who emphasized learner autonomy, holistic development and the natural process of learning (Comenius, 1986). These ideas were further advanced in the late 20th century through constructivist and social constructivist theories, particularly those of Jean Piaget and Lev Vygotsky, which positioned learners as active participants in knowledge construction (Shah, 2021). Social constructivism, in particular, highlighted the role of social interaction, culture and language in shaping cognition, framing learning as a process of co-construction within communities (Amineh and Asl, 2015). A significant transformation occurred in the 1970s with Paulo Freire's critical pedagogy, which redefined education as a means of human liberation rather than mere knowledge transmission (Freire and Macedo, 2005). Freire criticized the "banking model" of education and proposed a "problem-posing" approach, where learners actively engage in dialog, reflection and transformation of their social realities. This perspective extended constructivist thinking by embedding learning within broader socio-political contexts and emphasizing empowerment and social justice (Shah, 2021). Freire's ideas laid a critical foundation for OP, particularly its focus on active learning, learner agency and participatory knowledge creation (Freire and Macedo, 2005).

Building on this foundation, Paquette articulated three core values aligned with OP: autonomy and interdependence, freedom and responsibility and democracy and participation (Paquette, 1979). These principles emphasize the balance between individual agency and collaborative learning, as well as the importance of accountability and inclusive engagement. Shor (1980) further expanded Freire's work by advocating for collaborative and experiential learning in HE, where students actively participate in curriculum design and critically examine knowledge construction. Such developments marked a shift toward more flexible and personalized educational practices.

The institutionalization of these ideas can be observed in initiatives such as the Open University in the United Kingdom, which expanded access to education through distance learning models. By the late 1980s, empirical studies, such as Kwiatkowski (1988) and Miers (1989), demonstrated that facilitative teaching approaches – emphasizing student autonomy and exploration – were more aligned with OP principles than traditional knowledge transmission models (Kwiatkowski, 1988; Miers, 1989). These developments indicate that OP

is not the product of a single theory or individual but rather the result of a gradual evolution shaped by changing educational paradigms and societal demands. Despite the absence of a unified definition, OP consistently emphasizes learner autonomy, participation and educational equity.

The conceptualization of OP has continued to evolve alongside the development of digital technologies and the open education movement. At its core, OP is both a pedagogical philosophy and a practical framework that integrates traditional pedagogical principles with the values of openness, including those embodied in OER and the 5R permissions (retain, reuse, revise, remix, redistribute) (Wiley, 2007). These principles enable not only access to educational materials but also their adaptation and redistribution, thereby supporting more dynamic and participatory forms of learning.

The rise of digital technologies has significantly expanded opportunities for global access to knowledge, leading to the proliferation of OER and the emergence of OEP. Within this context, OP has increasingly been defined through its relationship with OER and OEP (Daly et al., 2022). Contemporary perspectives conceptualize OP as a set of teaching and learning practices embedded in openness across all aspects of pedagogy, including learning outcomes, instructional design, resource use and assessment. Both instructors and learners are viewed as active contributors to knowledge creation, engaging in activities such as co-creating OER, participating in open peer review and developing student-led projects (Al Abri et al., 2022).

OP contributes to teaching and learning in several important ways. First, it enables instructors to adopt flexible and innovative teaching strategies that enhance learner agency. Second, it empowers students to engage with open technologies, connect with global learning communities, and develop essential skills such as communication and cross-cultural collaboration (Al Abri et al., 2022). Importantly, OP repositions learners from passive consumers of knowledge to active creators, often requiring them to produce and share original work in publicly accessible formats (Arokiya Raj and Aram, 2019). This emphasis on authentic, open-ended tasks not only enhances engagement but also fosters a sense of responsibility and awareness of issues such as copyright and open licensing (Biddle and Clinton-Lisell, 2023).

Technological advancements have further strengthened OP by enabling new forms of collaboration and knowledge sharing. Digital platforms and social media allow learners to co-create and disseminate knowledge through diverse formats, including multimedia artifacts. These practices enhance students' digital competences and support the development of connected learning environments that extend beyond institutional boundaries (Baran et al., 2021). A defining feature of OP is its focus on producing publicly available learning outputs, thereby contributing to a broader culture of openness and knowledge sharing. The concept of OP cannot be fully understood without considering the broader evolution of pedagogy itself. In Western contexts, pedagogy has come to encompass theories of instruction and the role of educators in facilitating learning across disciplines (Shah, 2021). In contrast, in many East Asian traditions, pedagogy is closely linked to moral and cultural values, emphasizing the teacher's role as both knowledge authority and a moral exemplar. For example, the Vietnamese concept of *su pham* reflects not only instructional practices but also the ethical responsibilities of educators (Hùng, 1975). While such traditions have historically supported teacher-centered approaches, the emergence of constructivist and critical pedagogies has shifted the focus toward learner-centered education (Freire and Macedo, 2005). The notion of "openness" has similarly evolved over time. Early visions, such as Crowther's (1969) concept of barrier-free education, emphasized the removal of obstacles related to access, space and learning methods. This was followed by the open access movement, driven by the development of free and open source software, which facilitated the sharing of knowledge through digital technologies (Stallman, 2002; Suber, 2012). The subsequent emergence of open content, supported by licensing frameworks, enabled the free use and adaptation of educational materials (Hewlett et al., 2017). However, as (Wiley, 2017) noted, the merely availability of OER did not guarantee their effective use in HE, as adoption remained limited due to structural and cultural

barriers. In response, attention shifted toward pedagogical practices that could enhance the meaningful use of OER, leading to the development of OEP. These practices emphasized learner engagement, collaboration and the integration of open resources into teaching and learning processes. However, the limitations of OEP in addressing deeper pedagogical and philosophical questions led to the emergence of OP as a more comprehensive approach (OPAL Initiative, 2011). OP represents the convergence of educational philosophy, technological innovation and pedagogical practice, positioning openness as a dynamic and transformative process (Daniel, 2019).

Empirical research has demonstrated the positive impact of OP across various disciplines and contexts. For example, studies have shown that OP can enhance learners' professional identity, self-confidence and engagement through the creation and sharing of OER (Sánchez Vera *et al.*, 2022). In STEM education, OP has been associated with increased interaction and participation (John *et al.*, 2016), while in fields such as psychology, students have reported higher motivation when their work is publicly accessible and contributes to real-world knowledge for future cohorts (Biddle and Clinton-Lisell, 2023). Additionally, OP supports lifelong learning by enabling access to diverse educational opportunities through MOOCs and open platforms, particularly in contexts such as India and Japan (Arokiya Raj and Aram, 2019; Shigeta *et al.*, 2021). Despite these benefits, the growing emphasis on digital tools has raised critical concerns. Scholars have warned against the "technicalization" of OP, where pedagogy is reduced to a set of tools and techniques for content delivery. Drawing on Freire's critical perspective, this critique highlights the risk of losing the transformative and emancipatory potential of education (Freire and Macedo, 2005). OP should therefore not be understood only as the use of OER or digital technologies but as a pedagogical philosophy aimed at fostering critical thinking, dialog and social responsibility (Giroux, 2020).

In this sense, OP extends beyond instructional innovation to encompass a commitment to developing critically engaged learners who can participate actively in society. It emphasizes the importance of education as a means of empowerment, encouraging learners to reflect on their experiences, question existing knowledge structures and contribute to social change. As such, OP represents not only a pedagogical approach but also a vision for a more equitable and participatory educational system.

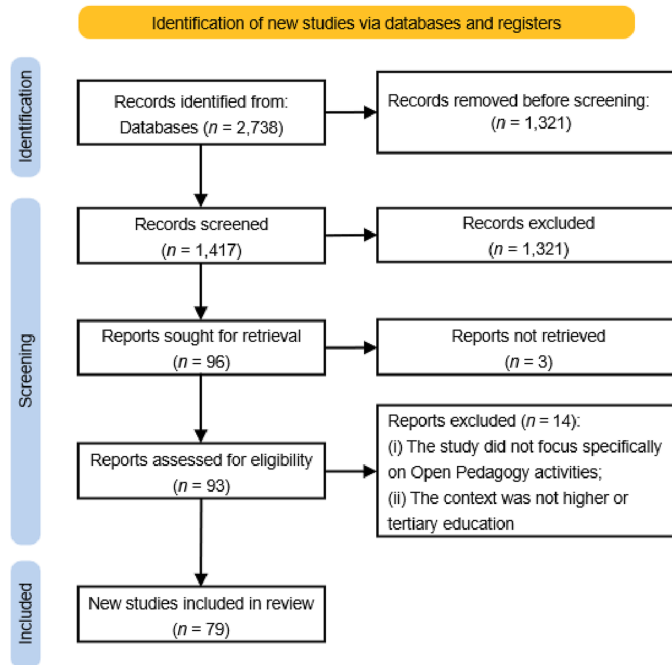
## Methodology

This study adopts a two-stage research design to map the landscape of OP in HE.

\* *Stage 1 - Data Collection:* The study follows the PRISMA 2020 guidelines, increasingly applied in education and social sciences (Page *et al.*, 2021). Data were retrieved from the Scopus database on December 25, 2024. Given the varied definitions of OP (Baran and AlZoubi, 2020), a broad keyword strategy was applied, including "Open Pedagogy," "Open Education," "Open Educational Resources," "OER," "Open Educational Practices," "OEP," "OER-enabled pedagogy," and "Open Educational Resources-enabled pedagogy," combined using Boolean operators (AND, OR). No restrictions were set for publication year or document type.

The initial search yielded 2,738 records, which were reduced to 1,417 after duplicate removal. Screening based on inclusion criteria (English language; journal articles, books, or conference papers; explicit reference to OP in title, abstract, or keywords) resulted in 96 documents. After full-text review, 79 documents were retained. Seventeen were excluded due to lack of focus on OP, non-HE context, or inaccessible full texts (Figure 1).

\* *Stage 2 - Data Analysis:* Bibliometric analysis was employed to examine the structure, development and impact of OP research (Ha *et al.*, 2020; Zancanaro *et al.*, 2015). This approach supports the identification of publication trends, influential contributions and emerging research directions (Tlili *et al.*, 2021; Wang *et al.*, 2017). In addition, thematic analysis was conducted to identify key term clusters and interpret dominant research themes (Kiger and Varpio, 2020). Data visualization and mapping were performed using VOSviewer,



**Figure 1.** The PRISMA flow diagram of the data selection process for OP literature from Scopus. Source: Haddaway *et al.*, 2022

a widely recognized tool for bibliometric analysis (Gao *et al.*, 2021). The combined methods enabled a systematic analysis of 79 publications and the identification of major research streams in OP.

## Results and discussion

Based on the 79 documents retrieved from the Scopus database, this section presents key findings on the development, distribution and thematic evolution of OP in HE.

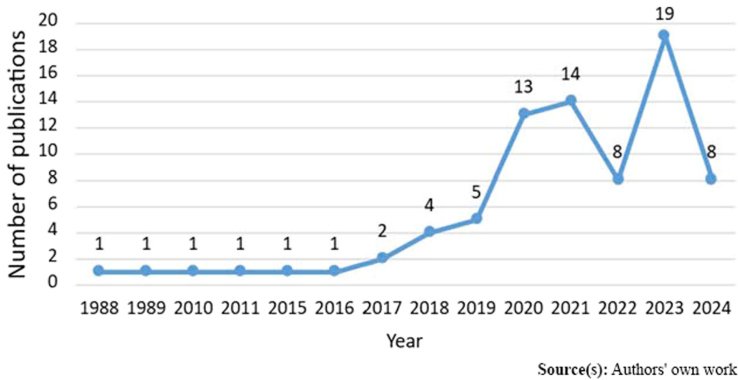
### *Evolution of OP research*

The development of OP research (Figure 2) can be divided into three phases aligned with shifts in educational policy, technology and pedagogy.

*Phase 1 (1980–1994): Emergence.* Early studies, particularly at the Open University (UK), emerged in response to financial constraints in European HE. Distance education offered flexible and cost-effective solutions, emphasizing personalization, lifelong learning and access for diverse learners (Kwiatkowski, 1988; Miers, 1989).

*Phase 2 (1995–2015): Foundation.* The expansion of digital technologies and the rise of OER provided a theoretical basis for OP. The Internet, Web 2.0, and online platforms facilitated content sharing, while policy initiatives – such as UNESCO’s introduction of UNESCO (2002) and OECD recommendations – promoted open knowledge ecosystems (Orr *et al.*, 2015). Research on OEP expanded globally, with contributions from the UK, Spain, Australia (Tlili *et al.*, 2021), China (Zaatri *et al.*, 2020) and Japan (Shigeta *et al.*, 2021).

*Phase 3 (2015–2024): Expansion and consolidation.* Since 2015, OP has gained attention as a transformative pedagogical approach. Publications increased notably during 2020–2023



**Figure 2.** The development of OP studies over time

(Cronin, 2017; Hegarty, 2015), driven partly by the COVID-19 pandemic, which accelerated demand for flexible and open learning models. Although output declined in 2024, this reflects a shift toward more focused research on quality, effectiveness and integration, including assessment frameworks (Clinton-Lisell and Kelly, 2024a) and learner motivation (Lazzara et al., 2024).

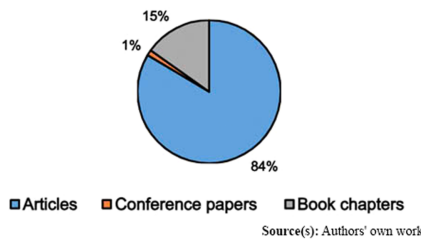
*Distribution of publications*

*By document type.* Journal articles dominate OP research (84%), followed by book chapters (15%), while conference papers remain minimal (1%) (Figure 3). This indicates strong reliance on formal academic publishing but limited presence in scholarly forums, suggesting opportunities for conferences to advance dialog and practice.

*By country.* OP research spans 32 countries, with the USA (51 publications), Canada (10), and the United Kingdom (6) leading (Table 1). These contexts benefit from strong traditions in distance education and EdTech innovation, including platforms such as OpenStax, which provides open textbooks (Pitt, 2023) and edX, frequently cited in the context of MOOCs (Zaatri et al., 2020).

International collaboration networks (Figure 4) reveal several clusters: a dominant group linking the USA, Canada, Egypt and Colombia; a second cluster including China, Spain, South Africa, France, Ireland and Italy; and emerging collaborations among Germany – UK and India – Turkey - Bosnia and Herzegovina. These patterns indicate both established research hubs and growing participation from developing regions.

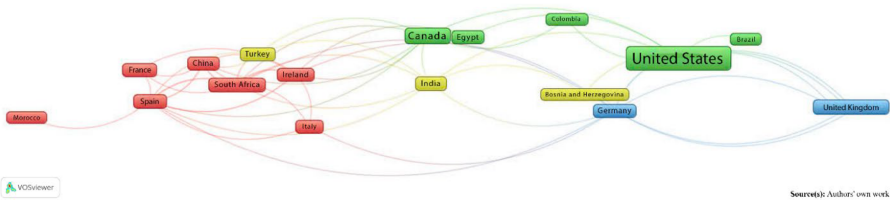
*By publishing institution.* OP research is distributed across 44 different publishers. As shown in Table 2, the International Review of Research in Open and Distributed Learning



**Figure 3.** Distribution of OP research by document type

**Table 1.** Top 10 countries with the highest contributions to OP publications

Rank	Country	Documents	Citations
1	USA	51	544
2	Canada	10	138
3	United Kingdom	6	31
4	Spain	5	37
5	South Africa	4	31
6	India	4	19
7	Netherlands	4	31
8	Ireland	3	88
9	Germany	3	10
10	Egypt	2	127



**Figure 4.** Visualization of countries collaborating in OP research

**Table 2.** Top publishing institutions on OP literature

Rank	Source	Documents	Citations	Open access
1	<i>International Review of Research in Open and Distributed Learning</i>	10	274	Yes
2	<i>Open Praxis</i>	7	14	Yes
3	<i>Communications in Information Literacy</i>	6	12	Yes
4	<i>Journal of Interactive Media in Education</i>	5	144	Yes
5	<i>Distance Education</i>	3	64	No
6	<i>Handbook for Online Learning Contexts: Digital, Mobile and Open</i>	3	3	Yes
7	<i>Sustainability (Switzerland)</i>	2	17	Yes
8	<i>Scholarship of Teaching and Learning in Psychology</i>	2	10	No

leads in both output and citations, followed by the Journal of Interactive Media in Education and Distance Education. Journals such as Open Praxis and Communications in Information Literacy contribute moderately but with lower citation impact, suggesting a maturing field. The presence of interdisciplinary outlets (e.g. Sustainability) and monographs reflects increasing cross-disciplinary integration. Notably, most publications are open access, supporting global dissemination and alignment with OP principles.

*Influential authors*

A total of 165 authors contributed to OP research (Figure 5), with leading scholars identified by publication and citation impact (Table 3). David Wiley is widely recognized for defining

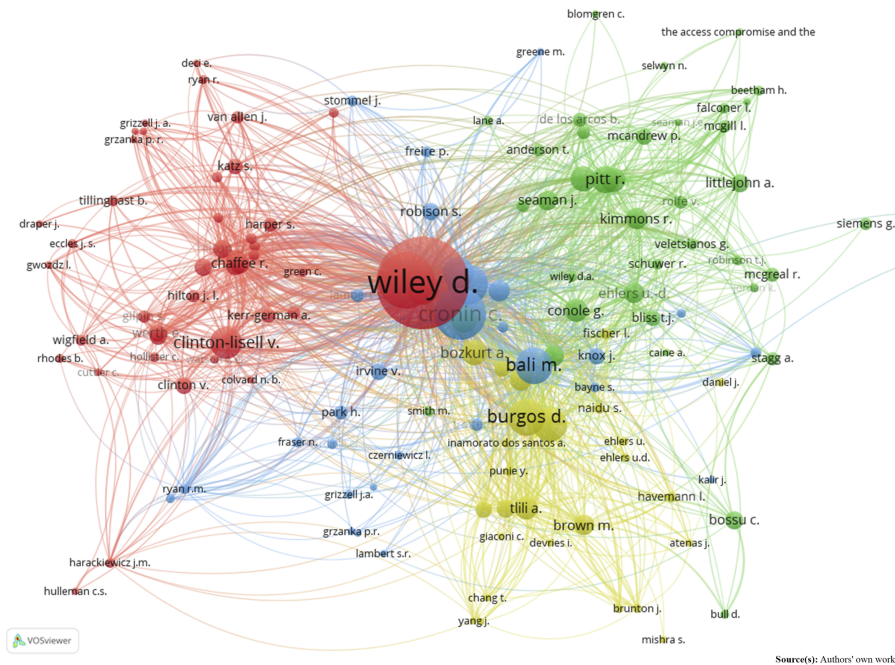


Figure 5. Visualization of authors conducting research on OP

Table 3. Top authors by publication and citations in OP research

Number of documents			Number of citations		
Rank	Author	Documents	Rank	Author	Citations
1	Virginia Clinton-Lisell	6	1	David Wiley	193
2	Daniel Burgos	4	2	John Hilton III	193
3	Eric Werth	3	3	Maha Bali	127
4	Katherine Williams	3	4	Catherine Cronin	78
5	David Wiley	2	5	Rajiv S. Jhangiani	78
6	John Hilton III	2	6	Lance Eaton	49
7	Maha Bali	2	7	Anna Mills	49
8	Michael Paskevicius	2	8	Michael Paskevicius	40
9	Evrin Baran	2	9	Daniel Burgos	36

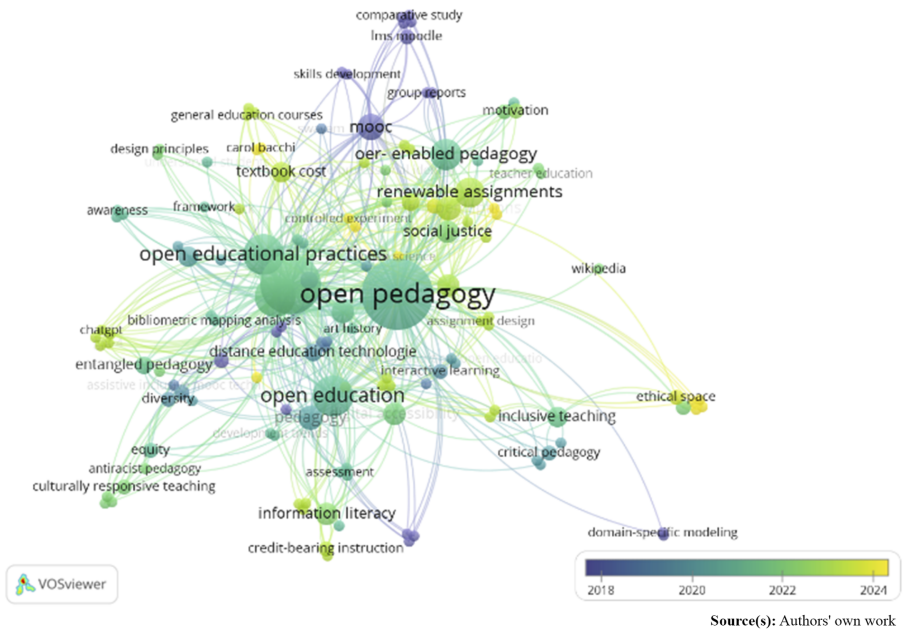
“open sharing” in OER (Wiley, 2007) and advancing OER-enabled pedagogy (Wiley and Hilton, 2018).

John Hilton III has provided extensive empirical evidence on the impact of OER on student learning outcomes (Hilton *et al.*, 2010, 2020; Hilton and Wiley, 2009). Other key contributors include Maha Bali, who examines OER policy and OP practices (Bali *et al.*, 2020); Catherine Cronin, focusing on participation and culture (Cronin, 2017); and Rajiv S. Jhangiani, who conceptualizes OP as an educational ethos (Jhangiani and Biswas-Diener, 2017). Virginia Clinton-Lisell contributes comparative research on student experiences (Clinton-Lisell, 2021; Clinton-Lisell and Gwozdz, 2023), while Anna Mills explores the integration of artificial intelligence within OP practices (Mills *et al.*, 2023) and Michael Paskevicius examines pedagogical design in the HE context (Paskevicius and Irvine, 2019).

*Keywords analysis and thematic trends*

A total of 138 keywords were identified (Figure 6), with those appearing at least four times summarized in Table 4. The most frequent terms include “open pedagogy,” “open educational resources,” “higher education,” “open educational practices,” and “OER-enabled pedagogy” (Baran *et al.*, 2021; Baran and AlZoubi, 2020).

Additional keywords – such as “pedagogy,” “digital accessibility,” “information literacy,” and “inclusive teaching” - highlight OP’s philosophical foundations and commitment to equity (Brown and Croft, 2020; Chen and Hendricks, 2023; Cummings, 2023). Meanwhile, terms like “MOOC,” “open textbook,” “open access,” and “technology” emphasize the crucial role of digital environments (Arokiya Raj and Aram, 2019). Emerging concepts such as “renewable assignments,” “student perceptions,” and “faculty-librarian collaboration”



**Figure 6.** Visual map of prominent keyword networks

**Table 4.** Top keywords used in OP research

Rank	Keyword	Occurrences	Rank	Keyword	Occurrences
1	open pedagogy	60	11	faculty–librarian collaboration	5
2	open educational resources	42	12	open access	5
3	Higher education	18	13	digital accessibility	5
4	open educational practices	18	14	social justice	5
5	open education	18	15	information literacy	5
6	oer-enabled pedagogy	10	16	open textbooks	4
7	renewable assignments	9	17	textbook cost	4
8	mooc	7	18	inclusive teaching	4
9	student perceptions	6			
10	pedagogy	6			



and factors influencing the learning processes. Key terms include *assignment, case study, class, study, student engagement*, alongside others related to assessment, educational research and learner motivation, such as *renewable assignment, project, perception* and *participant*. These keywords reflect a clear pedagogical shift from traditional, instructor-centered teaching models toward more active and collaborative learning strategies within learner communities, an essential trend in OP. Empirical studies demonstrate that OP encourages students to create and share OER on open platforms (Sánchez Vera *et al.*, 2022), develop open textbooks and engage in renewable assignments (Arokiya Raj and Aram, 2019; Wiley and Hilton, 2018). Notably, highly structured renewable assignments have been shown to enhance students' close reading, critical thinking, focus, memory and comprehension skills (Wallis *et al.*, 2022). Consequently, the production of publicly shared learning outputs, such as renewable assignments and open projects, serves as a foundation for rethinking assessment. This innovation emphasizes *assessment for learning* rather than solely *assessment of learning*, highlighting OP's alignment with formative, participatory and authentic evaluation practices.

*Cluster 3 – Impact and Implementation (green cluster)*. This cluster contains 14 terms and centers on evaluating the effectiveness and institutional impact of OP. It includes terms related to the role of instructors in implementing OP strategies, such as *instructor, open practice* and *role*. Additionally, it encompasses keywords linked to the assessment and evaluation of OP initiatives, including *quality, survey, question* and *response*. The presence of academic concepts like *chapter* and *term*, alongside organizational terms such as *adoption* and *implication* suggest a focus on both pedagogical practice and institutional integration. This cluster highlights the interconnectedness of instructional design, faculty engagement and organizational feedback mechanisms. Recent studies have assessed the impact of OP on student experiences, including levels of engagement, confidence and choice when comparing renewable assignments with traditional tasks (Clinton-Lisell and Gwozdz, 2023). Moreover, feedback from both instructors and students engaged in publicly sharing learning outputs demonstrates that OP generates motivation while also introducing potential challenges in the classroom (Clinton-Lisell and Kelly, 2024b). These elements play a critical role in validating, refining and scaling OP models within HE. As such, this group reflects the growing emphasis on evidence-based implementation and quality assurance in OP research and practice.

An analysis of the three prominent keyword clusters in OP research reveals a clear shift from the philosophy of “openness” at the systemic educational level to concrete pedagogical practices within the classroom. OP creates opportunities to promote learner-centered approaches by empowering students, leveraging OER policies and harnessing technological innovations to build digital learning environments. This expansion of an open learning culture contributes to greater equity in access to knowledge. However, this transition also raises important challenges that require further investigation and resolution. First, redefining the roles of teachers and learners: instructors must shift from being knowledge transmitters to facilitators who guide, support and enable learners to explore and construct knowledge independently (Al Abri *et al.*, 2022). Yet many instructors remain hesitant to adopt OP, concerned about losing control over content and assessment, or lacking experience in designing and implementing open learning activities (Baran and AlZoubi, 2020) and facing limitations in teachers' digital skills and pedagogical competence (Nurhayati *et al.*, 2025). Second, supporting learners in active roles: students may not yet be accustomed to assuming agency in OP contexts, lacking skills in self-directed learning, research, or collaboration. In addition, another challenge is that learners have not yet developed the habit of using open-source tools, as they do not perceive the value and engagement these activities bring to their learning process (Duan, 2024). Some may be reluctant to share their work publicly and feel insecure about their abilities (Bali *et al.*, 2020). This highlights the need for instructors to provide continuous guidance, ongoing support and feedback to facilitate learners' adaptation and skill development. Third, selecting appropriate OER and addressing copyright issues: identifying OER aligned with course content, learning objectives and student proficiency levels can be time-consuming (Al Abri *et al.*, 2022). Moreover, the uneven quality of OER

requires careful evaluation by educators (Baran and AlZoubi, 2020). Raising awareness of copyright and open licensing among both instructors and learners is therefore critical. Fourth, infrastructure and technology: the effective implementation of OP demands adequate investment in online learning platforms, collaborative tools and OER repositories (Zaatri *et al.*, 2020). Yet not all institutions possess the necessary technological and infrastructural capacity to scale OP broadly. These challenges underscore that OP is not merely a method of applying OER, but rather requires a systemic transformation encompassing learners, instructors, institutions and policymakers. Consequently, the study and evaluation of OP must consider specific cultural, technological and institutional contexts to bridge the gap between philosophy and practice, while advancing OP's role in contemporary HE.

### Conclusion and implications

In the context of HE undergoing profound transformation driven by digitalization and the increasing demand for lifelong learning, OP has emerged not only as an instructional innovation but as a paradigm shift in educational thought and practice. By integrating a learner-centered philosophy with the transformative affordances of digital technologies and OER, OP redefines how knowledge is produced, shared and legitimized in contemporary HE systems. While this study draws on data from the Scopus database – which may not fully capture the entire global research landscape – the findings nonetheless provide robust evidence that OP is evolving into a multi-layered ecosystem. This ecosystem spans conceptual foundations, pedagogical design, classroom practices and impact assessment, reflecting a maturation from fragmented initiatives toward a more coherent and systemic field of inquiry.

Theoretically, this study reinforces the positioning of OP within the broader trajectory of critical pedagogy, extending its emancipatory aims into digitally mediated learning environments. OP challenges traditional epistemological hierarchies by repositioning learners as active co-creators of knowledge rather than passive recipients. It operationalizes core principles of equity, participation and agency through practices such as open knowledge production, collaborative learning in networked environments and the integration of OER-enabled pedagogy. Importantly, OP also contributes to the formation of globally competent citizens by fostering awareness of copyright, open licensing and ethical knowledge sharing. In this sense, OP should be understood not only as a pedagogical approach but also as a normative framework for reimagining the social purposes of education in the digital age.

From a policy and institutional perspective, the findings highlight the need to move beyond isolated implementations of OP toward systemic integration. HE institutions and policymakers should consider embedding OP principles into curriculum design, quality assurance systems and faculty development frameworks. The development of institutional policies that incentivize the creation and reuse of OER, support open assessment practices and invest in digital infrastructure is critical for scaling OP effectively. Moreover, aligning OP with broader agendas, such as digital transformation strategies, internationalization and equity-driven education reforms, can enhance its impact and sustainability. Without such systemic alignment, OP risks remaining a localized innovation rather than a transformative force within HE.

Beyond its theoretical contributions, OP research has begun to generate empirical tools, including survey instruments and sub-scales for assessing learner perceptions, motivation and learning experiences (Biddle and Clinton-Lisell, 2023). However, these tools remain limited in scope and generalizability, underscoring the need for more rigorous and context-sensitive measurement frameworks. Future research should prioritize the development of comprehensive quality assurance models for evaluating student-generated outputs, including OER, within OP contexts (Cox and Trotter, 2017). Additionally, leveraging open platforms such as Wiktionary, Wikiversity, Wikibooks and Wikispecies offer promising avenues for extending OP beyond classroom boundaries and fostering authentic engagement with professional and disciplinary communities (Thomas *et al.*, 2021).

Furthermore, advancing the analytical depth of OP research requires more sophisticated investigations into learner behaviors within digital ecosystems. Large-scale data from online learning environments can provide valuable insights into personalization, engagement and learning trajectories, thereby informing the design of adaptive and learner-centered educational models (John *et al.*, 2016). Such efforts would not only strengthen the empirical foundations of OP but also enhance its scalability and institutional legitimacy. At a global level, the current concentration of OP research in Western contexts – particularly in the USA, Canada, the United Kingdom and Australia – reveals a critical gap in the literature. Expanding research into underrepresented regions is essential to capture the diverse cultural, technological and policy conditions that shape OP implementation. Cross-cultural and interdisciplinary approaches are especially important for understanding how OP can be adapted to different educational ecosystems while maintaining its core principles. In addition, future studies should explore the long-term impacts of OP on learners' professional identity, employability and lifelong learning capacities, thereby linking pedagogical innovation with broader socio-economic outcomes.

In conclusion, OP represents a transformative direction for HE, offering a pathway toward more inclusive, participatory and future-oriented education systems. Realizing its full potential, however, requires coordinated efforts across theory, practice and policy. By advancing rigorous research, fostering institutional commitment and embracing global diversity in implementation, OP can evolve from an emerging concept into a foundational pillar of education in the digital era.

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