

Open Pedagogy: A Systematic Review of Empirical Findings

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Abstract: Open licensing used in Open Educational Resources allows for teaching and learning techniques that are not possible with traditional copyright. There is a growing body of empirical research on open pedagogy. However, definitions and instantiations of open pedagogy vary in the literature. The purpose of this review was to systematically search and synthesize empirical findings on open pedagogy that were beyond simple use of Open Educational Resources. In this, the definitions of open pedagogy across empirical reports were examined. Generally, open pedagogy was defined in the context of open licensing affordances; however, there were exceptions particularly when examining faculty experiences with open pedagogy. Overall, both students and faculty reported positive experiences with open pedagogy, although there was some concern about public sharing as well as confusion about the logistics of open pedagogy tasks and the technicalities of open licensing. Synthesised findings may be used by faculty to inform use of open pedagogy especially when considering issues with student confusion and changing power dynamics.

Keywords: open pedagogy, open education, systematic review.

Introduction

Open Educational Resources (OER), which are teaching and learning resources with open licensing (D'Antoni, 2009), have become more commonplace in education (Contrada & Good-Schiff, 2021). Their open licensing allows them to be accessible online without fees, which benefits students and institutions by reducing the financial costs of education (Ikahihifo et al, 2017). Indeed, the cost savings are the most popular motivator for faculty to adopt OER (Fischer et al, 2020). However, the cost savings OER affords are not their only potential benefit: the open licensing allows for pedagogical techniques that are not possible with traditional copyrighted materials (DeRosa & Robison, 2017), namely student creation or editing of artefacts that are then available for others to use (Wiley & Hilton, 2018). These techniques are broadly known as open pedagogy and there is a growing body of research on students and faculty who experience it. However, the concept of what open pedagogy is and its instantiations vary across studies (Witt, 2020). The purpose of this systematic review is to examine how open pedagogy is conceptualised in empirical studies in which the affordances of open licensing beyond simple OER use were examined. In addition, the findings of studies on open pedagogy based on students and faculty are synthesised. In this way, the current study builds on Witt's (2020) analysis of open pedagogy to examine how research findings may vary depending on definitions.

What is Open Pedagogy?

The open licensing of OER through Creative Commons permits activities that are not permissible with traditional copyrights. There are numerous levels of open licensing (see Green, 2017, for a detailed



description of open licensing). The least restrictive level allows what are known as the “5R activities” in which users have the right to retain, reuse, revise, remix, and redistribute (Wiley & Hilton, 2018). In contrast, traditional copyrights typically do not allow anyone other than the copyright holder to have these rights (Pomerantz & Peek, 2016). Moreover, sharing and posting digital materials is often complicated and poorly understood under traditional copyright (Todorova et al, 2017; Wahid & Abdul Ghani Azmi, 2020). Traditional copyright laws often vary by country which may increase confusion (Todorova et al, 2017; Wahid & Abdul Ghani Azmi, 2020; Wijminga et al, 2017). Open licensing is more globally standardised, such as that developed by Creative Commons (Green, 2017). Open licensing allows for pedagogical techniques in which instructors and students can adapt and develop materials to be shared with others. These techniques are referred to as open pedagogy, also referred to as open educational practices, open education pedagogy, and OER-enabled pedagogy.

In a blog post by David Wiley in 2013, open pedagogy was defined as “only possible in the context of the free access and 4R permissions characteristic of open educational resources” (final paragraph; later broadened to 5R permissions to include retain). The term open educational practices also emerged, being defined in some contexts as using OER (Andrade et al, 2011) and in other contexts as teaching and learning activities that not only use but create and reuse OER (Conole, 2010). In this way, there is overlap between open pedagogy as defined by Wiley (2013) and open educational practices when students create or edit artifacts for others to use. However, open pedagogy viewed in this manner would not include simple use of OER whereas open educational practices would (Cronin & MacLauren, 2018).

The concept of open pedagogy has had multiple interpretations. A model of open pedagogy with eight key attributes to guide instructors in using OER was developed by Hegarty (2015). These attributes were helpful for open pedagogy but did not necessarily require open licensing to incorporate, such as connected community, peer review, and reflections. This broader approach is contrasted with a more precise approach by Wiley and Hilton who coined the term OER-enabled pedagogy (2018). OER-pedagogy is a specific approach regarding teaching and learning techniques that are only possible through open licensing (the 5Rs). Similarly, DeRosa and Robison (2017) describe OER use as a “jumping off point” for empowering students with student-centered, process-oriented learning through open licensing. This was further developed by describing open pedagogy as an “access-oriented commitment to learner-driven education AND as a process of designing architectures and using tools for learning that enable students to shape the public knowledge commons of which they are a part” (DeRosa & Jhangiani, 2018, pp. 13-14). In other words, open pedagogy is a method for students to be knowledge creators rather than only knowledge consumers.

In the current review, the term open pedagogy is used to broadly describe teaching and learning techniques made possible through open licensing (also referred to as OER-enabled pedagogy; Wiley & Hilton, 2018). Moreover, there is a focus on how the open pedagogy definition or explanation in the study aligns with OER-enabled pedagogy as described by Wiley and Hilton (2018). This is to allow for a detailed examination of how the study’s examination of open pedagogy resonates with the affordances of open licensing and contrasts open pedagogy with other effective pedagogical techniques that do not require open licensing (e.g., collaborative learning, non-disposable assignments in general). This approach allows for an examination of the unique nature of open pedagogy.

In addition to variation in conceptualising open pedagogy, course projects and assignments based on open pedagogy can be realised in several manners. Editing Wikipedia articles, producing videos demonstrating examples, writing test bank questions, social annotation, student development of syllabi and course assignments, and co-creating a textbook with students were all examples described in the literature (Croft & Brown, 2020, DeRosa & Robison, 2017; Wiley & Hilton, 2018; see Bali et al, 2020, for a typology). One unifying characteristic of these tasks is that they are not “disposable” assignments only completed for the students’ learning experience (Jhangiani, 2017). In contrast, they are non-disposable (also termed persistent or renewable) assignments that have value beyond the students’ learning (Seraphin et al, 2019). These pedagogical techniques would not be legally as feasible with traditional copyright because only the copyright holder could revise and redistribute materials. Moreover, having student artefacts be openly licensed allows them to be freely used by others (Wiley & Hilton, 2018).

The variation in the term open pedagogy as well as different manners of instantiation and tools and ways of measuring both usage and effect, make synthesising research findings challenging (Wiley & Hilton, 2018; Witt, 2020). These definitions vary even when the open pedagogy techniques all involve students creating, editing, or remixing OER. Open pedagogy in a study may be conceptualised as process oriented and emphasising collaboration (Masterman, 2016), learner directed (Bonica, 2018), or enabled by open licensing (Kruger & Hollister, 2020). Therefore, there is a need to explicitly examine definitions in research before delving into interpretations of the findings. Doing so allows for a nuanced synthesis of empirical findings interpreted in the context of the components and instantiations of open pedagogy involved.

Conceptually, there have been important discussions and proposals for how education could be more diverse, equitable, and inclusive through open pedagogy (Bali et al, 2020; Clinton-Lisell et al, 2021; Hodgkinson-Williams & Arinto, 2017; Lambert, 2018). There has been critically needed attention to how the increase in access and reduced educational costs provided by OER are aligned with social justice principles (Hare et al, 2020; Kruger & Hollister, 2020; Nascimbeni & Burgos, 2019). This may be particularly true for individuals in low- and middle-income countries as open education in general may enhance access to education (Bentley & Chib, 2016; Cox et al, 2020). In addition, open pedagogy could empower students, especially those who are marginalised, as knowledge creators not just consumers (Bentley & Chib, 2016; Hodgkinson-Williams & Trotter, 2018). Because students have opportunities to create artefacts for others to use, open pedagogy may support representational justice, that is, the equitable expression of voice (Lamber, 2018). This may be particularly important in the Global South as information in OER is too often from the United States or Canada (King et al, 2018). This leads to a North-South information flow of materials that lack cultural context (Hare, 2015). Through open pedagogy, students could create or revise locally relevant OER to allow for amplification of Global Southern voices. Because students have opportunities to create artefacts for others to use, open pedagogy may support representational justice, that is, the equitable expression of voice (Lamber, 2018).

One area of critical importance in open pedagogy is how it relates to student learning outcomes. Open pedagogy has been conceptually linked with philosophies known to benefit student learning, such as constructivism and student-centered learning (Allsop et al, 2020; Isik et al, 2018), as there is meaningful engagement with the content and students are actively engaged in developing their

knowledge (Masterman, 2016). Therefore, one can intuit that open pedagogy would likely benefit student learning. However, without empirical evidence regarding learning outcomes, one cannot determine if open pedagogy actually improves student outcomes.

In addition to learning outcomes, student perceptions of pedagogy, including open pedagogy, are also important to consider (Goodman et al, 2018). Student perceptions are important because if they do not perceive a pedagogical technique as advantageous for their learning, they are less likely to benefit from that technique (Brazeal & Couch, 2017). In addition, students who have positive attitudes towards their courses in general are more likely to persist (Cavanagh et al, 2018; England et al, 2017). Moreover, student descriptions of their experiences with open pedagogy may provide helpful feedback for instructors on how to better use the technique in their courses (e.g., Clinton & Khan, 2019).

The experiences of faculty with open pedagogy are important to examine. If faculty have negative experiences using open pedagogy, then the likelihood they will use it logically decreases. In addition, exploring faculty experiences may yield useful information on how to effectively implement open pedagogy. In doing so, other faculty members can better understand how to use it in their courses and instructional designers can better advise faculty in their professional development.

The Current Study

Given the complexities involved in defining and practicing open pedagogy as well as the growing empirical examination of open pedagogy, a review is necessary. Such a review can synthesise the various definitions and instantiations of open pedagogy in the empirical literature to develop a lens for examining the various research findings. In other words, a thorough review would allow for examination of not only how open pedagogy is defined, but how the findings relate to the definitions (see Witt, 2020, for a focused review on the definitions of open pedagogy). In addition, the status of the findings on student learning outcomes, student perceptions of open pedagogy, and faculty experiences teaching with open pedagogy can be synthesised through a review. In this way, a review would provide a better understanding of the existing literature as well as identifying gaps in which more research is needed.

There are three research questions that guide this review:

- 1) What were commonalities and differences in the concept of open pedagogy across studies?
- 2) What were the findings of open pedagogy studies focusing on students?
- 3) What were the findings of open pedagogy studies focusing on educators?

Method

Studies were considered relevant if they: 1) described themselves as examining open pedagogy (or a similar term), 2) reported empirical data on student or faculty experiences with open pedagogy (both qualitative and quantitative studies were eligible), and 3) were conducted in the context of course assignment (rather than students assisting with developing OER outside of academic responsibilities for pay; e.g., Hodgkinson-Williams & Paskevicius, 2013, or experiences with OER that did not involve students editing or creating artefacts (e.g., Hollich & Moore, 2020; Kaatrakoski et al, 2017; Littlejohn & McGill, 2016; Tang et al, 2020). Studies constrained to OER use have been examined in multiple

syntheses (Clinton & Khan, 2019; Hilton, 2016, 2020; therefore, they were not included in this review. Studies had to be in English due the linguistic limitations of the research team.

Relevant studies were searched for systematically. First, four scholarly databases were searched (Scopus, Directory of Open Access Journals, Web of Science, and Academic Search Complete) with phrases such as “OER pedagogy,” “open pedagogy,” “open educational practices,” and “open education pedagogy.” This yielded 2,719 citations with 165 duplicated that were deleted. The remaining 2,554 were each screened by two independent researchers (the author resolved conflicts) using the tool Abstrackr (Wallace et al, 2012). From this screening, the full texts of 35 reports were screened and 12 reports were relevant based on the inclusion criteria. Backwards searches of the references of these reports were conducted and two additional relevant reports were identified. A forward search of reports that had cited these 14 reports yielded an additional two relevant reports. The authors of each relevant report were contacted to ask about any additional relevant studies. Two additional reports were suggested that were added to the review. This led to a total of 18 reports in this systematic review (one report had separate empirical studies of faculty and students).

Coding

In preparation for analyses, the reports were each coded for basic methodological information, study purpose, conceptual definition of open pedagogy, type(s) of open pedagogy, and findings. Descriptions of studies relevant to students are in an Appendix in Table 1 and those from educators are in Table 2.

Results

General Description of Studies

There were fourteen studies on student learning outcomes and perceptions. In terms of geographical settings, thirteen of the studies were in the United States or Canada, which indicates a lack of global diversity common in this field (see Clinton & Khan, 2019). The methodologies used varied across studies. Surveys were used in ten of the studies with mixed methods approaches such as interviews used along with surveys in three of the studies with surveys. Three of the studies used interviews (without surveys) and two examined course assignments relevant to the open pedagogy experiences (one of which also used a survey). One study examined student learning outcomes.

There were six studies on faculty experiences. Five of them used qualitative methods, specifically interviews, and a sixth used survey methodology. The geographical settings varied. The purposes of the studies also varied in whether instructors knew about open pedagogy (Nascimbeni & Burgos, 2019), how open pedagogy was enacted (e.g., Paskevicius & Irvine, 2019), and how instructors viewed their students’ experiences with open pedagogy (e.g., Al Abri & Dabbagh, 2019; Masterman, 2016).

RQ1: Open Pedagogy Definitions/Explanations

Despite the divergence of views on the nature of open pedagogy previously described, there were consistencies in the definition of open pedagogy across studies likely due to the inclusion criteria. In most of the studies reviewed, open pedagogy involved students creating novel and useful artefacts that had value beyond learning (i.e., renewable assignments). Most of the studies explicitly indicated that the artefacts would be publicly shared and openly licensed. The affordances of open licensing were also described as crucial for open pedagogy across several studies. Indeed, the description of

open pedagogy in several of the studies specifically mentioned open licensing (Al Abri & Dabbagh, 2019; Kruger & Hollister, 2020; Nascimbeni & Burgos, 2019; Sheu, 2020; Tillinghast et al, 2020). However, there were variations across definitions even with those focused on open licensing. In some studies, the focus was on student-created OER in terms of open licensing (Al Abri & Dabbagh, 2019; Hare et al, 2020; Hollister, 2020; Tillinghast et al, 2020). In others, the focus was on the value of the student artefacts beyond the class (e.g., Baran & Al Zoubi, in press; Bloom, 2019).

Generally, the descriptions and instantiations of open pedagogy in the reviewed studies converged with the concept of OER-enabled pedagogy (Wiley & Hilton, 2018). There were three studies in which there was not a definition of open pedagogy that aligned with OER-enabled pedagogy (Cronin, 2017; Masterman, 2016; Paskevicius & Irvine, 2019). In each of these studies, a purpose of the study was to explore faculty teaching techniques for open pedagogy. Masterman (2016) grounded open pedagogy with existing pedagogical models noting the clear connection with student-centered teaching philosophies. Cronin (2017) described a continuum of open teaching techniques in which valuing social learning and non-traditional instructor roles as characteristics of open educators. Paskevicius and Irvine (2019) focused on digital literacies and how power dynamics shift in open pedagogy compared to traditional pedagogy.

One area in which studies varied was on whether publicly sharing and openly licensing materials was optional or required. Generally, public sharing and open licensing were optional. There were two studies in which it was explicitly required (Bonica, 2018; Zhang et al, 2020). In the Bonica (2018) study, students had the option of using a pseudonym rather than their names if there were concerns about privacy. However, Bonica reported that all students opted to use their real names in order to showcase their work to potential employers in the future. Zhang and colleagues (2020) had students post on public social media platforms. In their findings, a need to better support and adapt activities for shy students was noted.

Findings about Students

The majority of studies with students focused on their perceptions of open pedagogy in its various instantiations. Across studies, students generally perceived open pedagogy as a positive and meaningful learning experience. Students expressed appreciation in developing artefacts that could be used by others. This appeared to foster pride in their work likely because they knew it would be seen and used by others (Al Abri & Dabbagh, 2019; Hollister, 2019; Zhang et al, 2020). In addition, students reported feelings of agency as scholars—that they were contributing to a body of knowledge rather than simply consuming what is already known (Baran & Al Zoubi, 2020).

Students reported developing better critical thinking skills through open pedagogy than traditional pedagogy (Hilton et al, 2019, 2020). This is likely because students had to evaluate sources and synthesise ideas when creating their artefacts in addition to giving and receiving feedback to improve their work (Cargas et al, 2017). Evaluating sources and peer feedback are not unique to open pedagogy but these techniques may be important for successful open pedagogy (Hegarty, 2015). This development of critical thinking through open pedagogy could explain one of Tillinghast and colleagues' (2020) findings. Students in course sections with OER without open pedagogy reported better perceptions of the OER textbook than did students in the open pedagogy sections using the same OER. Given that the open pedagogy task was to improve the OER textbook, students in the open

pedagogy section may have been more skeptical of the existing textbook. Rather than accepting the textbook as being authoritative and complete, students who were tasked with improving the textbook realized that it, like all textbooks, was imperfect (e.g., Woodson, 2015)

Learning outcomes were examined in only two studies. Tillinghast and colleagues (2020) as well as Bloom (2019) compared course sections with students' open pedagogy to students having more traditional assignments. The two approaches to open pedagogy differed in that Tillinghast and colleagues had students revise an existing OER textbook and Bloom had students develop OER learning tools. However, their findings regarding student learning outcomes were similar. Neither found differences in performance for grades in the course. Bloom noted that increases in writing mechanics knowledge appeared to be larger for students in the open pedagogy group, but this difference was only marginally significant. Given the relatively small sample, it is possible that reliable results could be found with a larger sample in future research.

There were negative experiences reported by students that should be considered when designing and implementing open pedagogy. Across the studies, open pedagogy involved a departure from traditional, instructor-centered instruction in which the students' artefacts do not have an impact outside of the students' learning and grades. Given the difference from previous learning experiences and the potential for public display of their work, it is not surprising that there were relatively high rates of anxiety associated with open pedagogy reported in one study (Hollister, 2019). However, this may have been somewhat due to the short timeframe to complete the project. In addition, instructors can prevent unnecessary anxiety by ensuring students understand policies for public sharing and use for information (one source of student concern: Baran & Al Zoubi, 2020). Peer collaboration, although not unique to open pedagogy, was a negative experience if students resented being dependent on their peers for successful projects (Flinn, 2020). There was also some critique about the role of students, rather than instructors, in developing course materials, namely because there were concerns about accuracy (Hilton et al, 2019).

Although technology, and the various problems involved with it, is not unique to open pedagogy, sharing and open licensing of student artefacts generally involves use of digital technologies. Not surprisingly, there were issues specifically with technology reported in two studies (e.g., Hilton et al, 2019; Zhang et al, 2020). As such, faculty should be mindful of how to best support students as they learn new technologies. Part of this could be limiting the number of technological tools students need to learn as too many can be overwhelming (Zhang et al, 2020). Another part could be ensuring that the tools are ones students are familiar with so that students could focus on their artefact creation rather than learning new tools. In Flinn (2020), students used technology they were already well-versed in and students reported feeling confident using the tools in the course.

Findings about Faculty

Faculty perceptions of student experiences with open pedagogy often converged with findings on what students reported. This is reassuring in that there does not appear to be a sharp divide between what faculty think students experience and what students actually report experiencing. Namely, that students have more pride in their renewable assignments than they do with traditional assignments and that open pedagogy promotes active student learning (Al Abri Dabbagh, 2019; Masterman, 2016).

One common theme across studies is that open pedagogy is not the default approach of educators (Cronin, 2017; Nascimbeni & Burgos, 2019; Tillinghast et al, 2020). This is the case even when examining educators adopt OER (Cronin, 2017; Nascimbeni & Burgos, 2019; Tillinghast et al, 2020). One reason for this may be that faculty are focused on the cost savings advantages of OER and simply not aware of the pedagogical opportunities afforded by OER (Fischer et al, 2020). Other barriers include concerns about student privacy, uncertainty about the benefits of open pedagogy for student learning, skepticism about the potential quality of student-created resources, and lack of institutional support for open pedagogy (Cronin, 2017; Masterman, 2016). One method that could potentially address some of these barriers would be to provide training in open pedagogy using open pedagogy. For example, faculty could receive training in social annotation through using social annotation tools themselves (Kalir et al., 2020). In this way, faculty could receive support while also learning methods of protecting student privacy and ensuring quality. Quality of student-created resources could also be checked through rubrics and peer review (Al Abri & Dabbagh, 2019).

Concerns about the effectiveness of open pedagogy is a question that can be addressed through further research. Although this review presents evidence that students generally find open pedagogy helpful (in various conceptualisations and instantiations), little is known about learning outcomes (in contrast to the ample empirical evidence on open textbook and OER efficacy in general; Clinton & Khan, 2019; Hilton, 2016, 2020).

Limitations and Future Directions

There are limitations of the studies reviewed and the review itself that need acknowledgement. Namely, there was a lack of global diversity in the studies. With the notable exception of Nascimbeni and Burgos (2019) in which 36 countries were represented in the sample, the geographical settings were the United States, Canada, and Western Europe. Future research studies should examine open pedagogy specifically in low- and middle-income countries. This would be particularly important to understanding the specific role of social justice in open pedagogy. Through opportunities for students to share their knowledge and perspectives through co-creation of OER, open pedagogy provides opportunities for representational justice, that is, being able to share one's experiences and voice (Clinton-Lisell et al, 2021; Hodkinson-Williams & Trotter, 2018). However, such opportunities should be empirically examined through inquiry to examine if open pedagogy truly supports representational justice, especially in low-and-middle-income countries. That said, lack of access to the Internet and other resources would likely need to be addressed in some contexts, particularly in rural areas of the Global South, before the potential benefits of open pedagogy could be realized (King et al, 2018).

Overwhelmingly the findings regarding students were about perceptions. There is more direct inquiry needed in terms of student learning outcomes. In addition, many studies embraced a broad view of open pedagogy in terms of multiple instantiations. This allows for a broad overview of student experiences co-creating OER and sharing their work publicly. However, given that student perceptions vary depending on the instantiation of open pedagogy (Hilton et al, 2020), more focused examinations in the future would be useful. For example, a study in which students had multiple experiences with open pedagogy within a course (e.g., Sheu, 2020) could ask students to compare their

experiences with the various instantiations. Such an approach would build on Hilton and colleagues' (2020) informative work by having comparisons with the same students and instructor.

One limitation of this study is that studies may be examining open pedagogy without using the "open" label. For example, editing Wikipedia articles is an example of OER-enabled pedagogy (Wiley & Hilton, 2018) and there has been research on this topic (Apollonio et al, 2018; Maggio et al, 2020; Petruccoal & Ferranti, 2020). However, these studies on student or faculty perception of editing Wikipedia articles were not couched in the concept of open pedagogy in their reports. Therefore, such reports, as well as reports of other techniques that would fit the criteria of OER-enabled pedagogy (e.g., Stovall et al, 2019; Wiley et al, 2017) would not inform the first research questions about how open pedagogy is defined in empirical research and were not included in this review.

There were several instantiations of open pedagogy that have been described in articles, but not included in this review because empirical data were not included. These articles often have rich and helpful descriptions of how techniques such as social annotation or editing the writing in existing OER (e.g., Jhangiani, 2017; Kalir et al, 2020). Future researchers could use these descriptions as a roadmap for investigating these techniques in the context of open pedagogy research.

Conclusion

Open education has prompted a movement to empower students in manners that are not possible with traditional copyrighted materials. Open pedagogy is an important component of this movement and there is a growing body of empirical research on the topic. This review served to synthesise the various definitions and instantiations of open pedagogy as well as the research findings regarding students and faculty. Although definitions varied, student experiences were fairly consistent across studies with students generally viewing open pedagogy positively. Faculty generally viewed their experiences as beneficial as well.

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*indicates inclusion in systematic review

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Appendix

Table A1: Studies focusing on student outcomes and perspectives

Author(s), year	Participants/educational setting, research methods, geographical location	Open pedagogy description, alignment with OER-enabled pedagogy (Wiley & Hilton, 2018)	Study purpose/questions	Findings
Al Abri & Dabbagh, 2019	Graduate students in instructional design and technology (N = 11), open- and close-ended survey, United States	Various descriptions of open pedagogy with a focus on OER-enabled pedagogy through renewable assignments that have Creative Commons CC-BY licensing. Students developed and shared instructional materials. Student artifacts had value beyond learning, were public (optional), and openly licensed (optional).	To examine student perceptions of renewable assignments.	Students reported satisfaction with renewable assignments. The majority stated they would publicly share future assignments with a minority concerned about whether their work was of sufficient quality to be publicly available. Motivations for renewable assignments included getting credit for work posted, sharing resources with others, and removing financial constraints to accessing learning resources.
Baran & Al Zoubi, in press	Graduate students in education courses, interviews (N = 13), United States	"In this paper we define open pedagogy practices as a dimension of OEP (open educational practices) that includes the teaching and learning practices while engaging in renewable assignments" (p. 4). Students created OER (projects varied by course). Student artifacts had value beyond learning,	To analyse the components and outcomes (positive and negative) of open pedagogy practices.	Two positive outcomes were knowledge of open licensing and student agency. Students felt empowered to share knowledge with open licensing, but also concerned about violated policies for public sharing and not getting appropriate attribution. In terms of agency,

		were public, and openly licensed.		students felt their contributions were important and expressed pride in their work.
Bloom, 2019	First-year undergraduate students in composition courses (N = 92), quasi-experiment comparing learning outcomes between sections with open pedagogy sections without, United States	“Open pedagogy...refers to the broader practice of redesigning the educational experience to be more meaningful by leveraging the permissions of open content to involve students in a more engaged learning experience via assignments that include curation and remixing.” (p. 343). Students developed learning tools to help others understand rhetoric. Student artifacts had value beyond learning, were public (optional), and openly licensed (optional).	To compare student learning outcomes between course sections with open pedagogy and sections with traditional, disposable assignments.	Student performance on a concept quiz and argumentative essay were very similar in the two sections. When pretest to posttest changes in writing mechanics knowledge were compared, both groups improved significantly and there was a marginally significant trend indicating more improvement for students in the open pedagogy sections.
Bonica, 2018	Undergraduate students in a management course, surveys (N = 12), United States	“...the objectives of learning and the methods used for learning are highly determined by the learners” (p. 12). Students designed the syllabus and posted course portfolios (artifacts varied). Student artifacts had value beyond learning and were publicly shared (required). Open licensing of student artifacts was not reported.	Description of a use case of open pedagogy without an explicit purpose	Students generally reported that open pedagogy was effective, particularly with improving presentation skills, with one student expressing discomfort with the lack of structure.
Flinn, 2020	First-year students in electrical trades, mixed methods with questionnaire (N = 18) and interviews (N = 9), Canada	“A wide range of teaching practices that incorporate the use of OER and an open educational philosophy.” (p. 18). Student artifacts had	1) To assess barriers to student co-creation of OER. 2) To examine the student experience of co-creation of OER.	1) Finding information to create resources was a barrier for a few students. Students generally reported having

		value beyond learning, were public (optional), and openly licensed (optional).		the technological skills to create OER. Students did not report accurate understanding of open licensing. Some students struggled with collaborating with peers but noted improvements with time. 2) Students had mixed opinions about whether they would prefer traditional textbooks over creating their own resources although they agreed they learned more with creating resources than they would have using a traditional textbook.
Hare et al, 2020	Doctoral students in three education research courses (N = 34), content analyses of discussion board posts on open pedagogy and course evaluations, United States	“In this article, open pedagogy refers to student creation of OER” (p. 441). Students created an open research guide. Student artifacts had value beyond learning, were public (optional), and openly licensed (optional).	To investigate students’ process of mutual adaption when co-creating OER including any potential resistance or misunderstandings.	Students reported a desire to make their work available to non-academics which was often motivated by social justice. However, some students felt it was inappropriate to be critiquing the work of other researchers. There were some examples of students conflating materials online without cost with OER in general. A small minority of student comments indicated resistance towards open pedagogy mainly because they did not view themselves as

				scholars and lacked self-efficacy in their skills.
Hilton et al, 2019	College students with 19 different instructors (N = 173), survey, United States	“Four common principles: Focus on access, broadly conceived; emphasizes learner-driven curricula and educational structures; stresses community and collaboration over content; sees the university in the context of a wider public” (p. 278). Artifacts varied by instructor as did open licensing and sharing.	To examine student perceptions of the value of open pedagogy (in multiple instantiations) compared to traditional teaching assignments	Overall, students reported same of greater value of open pedagogy over traditional assignments. Critical thinking was reported the most supported by open pedagogy and mastery of academic content was the least supported by open pedagogy (although still better supported than traditional activities). In open-ended responses, students reported open pedagogy requires making connections across ideas, increased engagement, and real-world applications. Criticisms of open pedagogy included instructors, rather than students, should make materials because student-made materials would likely be inaccurate.
Hilton et al, 2020	Undergraduate students in two courses (each with different instantiations of open pedagogy; N = 84), survey, United States	“Open pedagogy contains many different interpretations, and it is continuing to develop” (p. 2). In one instantiation, students created multiple-choice questions. In the other, they co-created the syllabus and assignments. Student artifacts had value	1) To examine student perception of the value of the two instantiations relative to traditional teaching. 2) To examine differences in student perceptions of the two instantiations.	1) Students in both the multiple-choice and co-creating syllabus instantiations generally indicated they learned better course content, effective communication, and critical thinking skills compared to

		beyond learning, were public (optional), and openly licensed (optional).		traditional teaching. 2) Students tended to have more positive perceptions of the value for co-creating the syllabus and assignment than writing multiple-choice questions.
Hollister, 2019	Library and information science graduate students (N = 26), survey and course reflection paper, United States	“The author adopted an open pedagogy framework for the course that involved students creating their own textbook.” (p. 2). Each student wrote a chapter about a non-North American country’s libraries and the chapters were combined into a text with Creative Commons licensing. Student artifacts had value beyond learning, were public (optional), and openly licensed (optional).	1) To examine students experiences with the project. 2) To identify helpful and unhelpful components of this open pedagogy project	1) All of the survey responses indicated that the project was valuable and recommended it for future students. However, 60% of students also reported the project was anxiety provoking. 2) Students appreciated the renewable aspect of the project and took pride in their work. The main criticism was the lack of time to fully develop the project.
Kruger & Hollister, 2020	Undergraduate students in a public health course, survey (N = 70), United States	Open pedagogy is defined based on Wiley and Hilton’s (2018) concept of OER-enabled pedagogy. Students co-created an OER textbook. Student artifacts had value beyond learning, were public (optional), and openly licensed (optional).	To examine student experiences with co-creating an open textbook.	Students overwhelmingly agreed with statements about the textbook writing assignment being valuable, feeling confident in the process, and being engaging.
Sheu, 2020	Undergraduate students in a lifespan development course (N = 42), surveys, United States	Open pedagogy is defined based on Wiley and Hilton’s (2018) concept of OER-enabled pedagogy. Students created multiple-choice questions,	To investigate the perceived value of renewable assignments as well as provide suggestions for improving future open pedagogy. This study focused on writing	Students who preferred open pedagogy reported writing questions helped with exam preparation and reading

		curated OER, and created websites. Student artifacts had value beyond learning, were public, and openly licensed (optional).	questions although other types of open pedagogy were incorporated in the course.	comprehension. Students who preferred traditional activities reported in depth thinking and not needing to be dependent on other students' as in collaborative assignments. Students appreciated that the questions were checked by the instructor prior to being on the exam, which provided assurance about quality.
Stancil, 2020	Graduate students in education training degrees or certificates working fulltime in the same field (N = 18), interviews, United States	Definition was used from Cronin, 2017, "collaborative practices which include the creation, use, and reuse of OER, as well as pedagogical practices employing participatory technologies and social networks" (p. 4). Students created projects to address their needs at their jobs. Student artifacts had value beyond learning (designed to be used in their employment) but sharing and licensing were not reported.	1) Explore working graduate student perceived learning of course content through reusable assignments. 2) Explore how working graduate students incorporate reusable assignments in their employment.	1) One theme was that student understanding of course content was enhanced by reusable assignments due to their direct application to the field. Students also appreciated having autonomy in creating reusable assignments, which along with real-world application, provided motivation to learn the course content. 2) Students appreciated being able to use their course assignments in their work. This provided a valuable product for their employment which was an efficient use of their time as well as making the assignment have a

				real-world context.
Tillinghast et al, 2020	Undergraduate students in an introductory nutrition course, quasi-experimental (one course with OER, another course with OER + open pedagogy), mixed-methods approach with survey (N = 317) and interviews (N = 20), United States	<p>“The 5Rs permissions, which are the right to retain, reuse, revise, remix, and redistribute...support open pedagogical approaches to instruction.” (p. 1). Students had a project to locate relevant articles on “health at every size” for incorporation into their textbook. Student artifacts had value beyond learning. Because students were only responsible for identifying and recommending articles for incorporation into the textbook, public sharing and open licensing are not relevant (they did not write the additions themselves).</p>	<p>1) To compare the costs, outcomes, use, perception, and engagement of students in courses with or without open pedagogy. 2) To inquire with students in courses with or without open pedagogy about their experiences relevant to costs, outcomes, use, perception, and engagement.</p>	<p>1) Open pedagogy did not directly affect the financial costs beyond the OER adoption relative to commercial textbooks. Student grades and withdrawal rates were similar in the two courses. Students read and perceived the course textbook similarly. Engagement was similar except students without open pedagogy reported the textbook better helped explain course concepts. 2) Students in both courses said the textbook was helpful for their learning as a supplementary resource. Students in the open pedagogy course said the assignments helped with engagement.</p>
Zhang et al, 2020	Students in a university course on teaching family education during the COVID-19 pandemic (N = 36), surveys and interviews, China	<p>“Researchers and educators have shifted their focus from creating and publishing OER to practices that can be implemented using OER for education these are referred to as Open Educational Practices.” (p. 2). Student artifacts had value beyond learning, were public (required), and openly licensed (required).</p>	To examine student perceptions of a course based on open educational practices.	<p>Students felt pride in their work because it was shared outside of the course. A challenge was learning how to use multiple technological tools for the course, some of which were not mobile compatible. Students appreciated the opportunities to collaborate particularly due to the social isolation</p>

experienced during the pandemic.

Table 2: Studies focusing on faculty experiences

Author(s), year	Participants, research methods, education setting, geographical location	Open pedagogy description, alignment with OER-enabled pedagogy (Wiley & Hilton, 2018)	Study purpose/questions	Findings
Al Abri & Dabbagh, 2019	One instructor, interview, graduate course in instructional design and technology, United States	Various descriptions of open pedagogy with a focus on OER-enabled pedagogy through renewable assignments that have Creative Commons CC-By licensing. Students developed and shared instructional materials. Student artifacts had value beyond learning, were public (optional), and openly licensed (optional).	Instructor perceptions of teaching with renewable assignments	Renewable assignments foster student pride in their assignments due to public availability. Students also seemed to be more invested in the quality of their assignments because of the public sharing. Rubrics and peer review would also improve quality. Faculty may be more willing to assign renewable assignments if they could put the publicly shared works on their curriculum vitae.
Cronin, 2017	University instructors (N = 19) from a variety of disciplines, interviews, Ireland	"Open educational practices (OEP) is a broad descriptor of practices that include the creation, use, and reuse of open educational resources (OER) as well as open pedagogies and open sharing of teaching practices." (p. 1). Student artifacts and licensing varied by instructor.	How do faculty use open educational practices (OEP), reasons for lack of use of OEP, what are shared themes in responses by educators who use OEP?	Eight out of 19 participants reported using OEP. Those who were "open educators" reported having student discussions on social media, course assignments on public blogs, and supporting students to have their work publicly available. Concerns about the effectiveness of OEP and lack of resources to incorporate OEP

				were common barriers. How to balance openness and privacy, valuing student learning through social interaction, as well as breaking down barriers in traditional teaching roles were themes of OEP educators. Educators who used OEP reported proficient digital literacy.
Masterman, 2016	Instructors at research-intensive universities (N = 14), semi-structured interviews, United Kingdom	“Characteristics of open learning...include: greater autonomy...learning through collaborating...validating each other’s learning by sharing and giving feedback” (p. 34). Student artifacts and licensing varied by instructor.	To explore connections between open pedagogy and existing models of college pedagogy.	Open pedagogy connected well with student-centered philosophies of teaching. One theme is that open pedagogy supports dialogue between students and teachers that support knowledge development. Generally, students creating OER was seen as a valuable activity for developing communication skills, but quality control checks needed to be in place. Open pedagogy was aligned with the institution’s charitable mission.
Nascimbeni & Burgos, 2019	University educators (N = 724), survey, 36 countries	Open pedagogies are practices that can only occur because of the licensing of OER. Student artifacts and licensing varied by instructor.	How familiar and capable are university educators to use open teaching approaches?	Educators were categorized as traditional (transmissive and didactic; 28%), engaging (collaborative methods with and without OER; 48%), and open teachers (co-create content with

				students; 24%). Practices of open teachers included wikis, blogs, and communities of practice.
Paskevicius & Irvine, 2019	University faculty (N = 11), interviews (phenomenological approach), Canada	Various definitions and approaches were described. One purpose of the study was to examine how faculty themselves define it. Student artifacts and licensing varied by instructor.	To examine how faculty members who embrace open educational practices conceptualize those practices and how these practices influence their teaching practices.	Faculty reported that open pedagogy fostered personalized learning. Open pedagogy enhanced diversity of student learning experiences, particularly with global resources and de-colonizing education. Digital literacies were important for using open pedagogy. Shifts in power from the teacher alone to shared power with students.
