Open Educational Practice and Preservice Teacher Education: Understanding past practice and future possibilities

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Abstract: 'Open' is a commonly applied descriptor for a variety of educational initiatives but its meaning and implications vary widely. This paper reviews some more recent understandings of 'open' in education and what that could mean for teacher education. Frameworks for understanding open educational practice are reviewed, and past and present practices used in example teacher education courses are evaluated against these frameworks to develop understandings of how selected practices match the characteristics of openness. Directions for future development of open educational practice in teacher education are proposed.

Introduction

Open may be the *new black* in education. Recent decades have seen waves of enthusiasm for such innovations as learning objects and associated repositories (e.g. merlot.org, scootle.edu.au), OpenCourseWare (ocw.mit.edu), Open Education Consortium (www.oeconsortium.org), Open Educational Resources (oercommons.org), non-commercial and then commercial MOOCs (Massive Open Online Courses), Open Educational Resources University (oeru.org), and Open Educational Practices (OEP). The precise meaning of open and what has been opened varies across these manifestations. This paper reviews current understandings of 'open' in education, evaluate some past practices against those understandings, and propose future directions for open educational practice in teacher education.

Wiley (2010) listed a variety of manifestations of 'open' in education, including several of those mentioned in the previous paragraph that were current at the time. He noted that in education 'open' is most widely understood as describing artifacts that, when shared, can be reused, redistributed, revised, and remixed. In his view, "if there is no sharing, there is no education" (3:00 min) and generous sharing, rather than legalistic enforcement of property rights, is fundamental to advancement through education. He went on to point out the historical significance of the invention of printing which lowered costs of distributing information and to contrast the sharing of material objects such as books with the sharing of information online which occurs without diminishing the information held by the sharer.

The Open Educational Resources (OER) movement proposes that "making educational resources available to all is a fundamental right" (Conole, 2012, p. 131). According to Wiley (2010) and others, demand for education in the developing world is at a scale that makes it impossible to build and staff institutions quickly enough to satisfy the need. Fortunately, this rising demand coincides with a time when it is possible, using online systems, to share educational resources at close to zero cost. Nevertheless, Conole (2012) lamented that uptake of OER has been very limited and the deepening digital divide was leaving those who are not connected behind at an increasing rate.

Despite funding and effort poured into creating and promoting OER, there has seldom been matching uptake of OER for use and reuse. Consequently, OER proponents have characterized what has happened as a first phase. The focus has been on developing and promoting OER together with the repositories and other mechanisms, such as Creative Commons (creativecommons.org) licensing, that make them available for use and redistribution. The necessary second phase is Open Educational Practices (OEP) in which OER are used to improve learning experiences (Ehlers, 2011). Such practices "support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path" (p. 3).

Relevance of OER and OEP for teacher education

Many teachers are active users of resources obtained from a variety of sources on the web including commercial providers (teacherspayteachers.com, australiancurriculumlessons.com.au) and OER repositories (oercommons.org). Many are also active curators of teaching resources using sites such as Pinterest and Scoop.it to compile and share collections of resources. Introducing pre-service teachers (PSTs) to tools and processes for curating teaching resources develops important skills for future professionals (Albion, 2014). Involving PSTs in the process of curation takes them beyond the mere (re)use of resources created by others to making an active contribution to the profession and is a step toward engaging them in OEP. Such initiatives are consistent with research that has demonstrated the value of promoting sharing among teachers for building a stronger and more effective teaching profession.

In the context of a study of computer use by teachers in the USA, Becker & Riel (2000, p. 2) "defined professional engagement as a teacher taking effort to affect the teaching that occurs in classrooms other than his or her own." They constructed a measure based on frequency of substantive communication with other teachers in their school, professional interactions with teachers at other schools, and involvement in broader sharing activities such as mentoring, presentations and writing for teacher publications. Their findings indicated that higher levels of professional engagement were associated with constructivist views and praxis of teaching, and using computers more effectively for learning and teaching. They described a continuum of teacher practice from educators who engaged in a form of 'private practice', working exclusively in their own classrooms to those who aspired to 'professional practice' and saw their role as extending to helping other teachers become as successful as possible. Although this research predated OEP and OER as descriptors it seems clear that the underlying ideas about the value of sharing for teachers' learning and performance were present.

Other research has confirmed the benefits of increased professional engagement for teachers. A survey of 1200 teachers across the USA found that working with colleagues to build collective expertise is strongly associated with effective teaching and increases the likelihood of teachers remaining longer in the profession (Berry, Daughtrey, & Wieder, 2010). Berry et al. cited previous findings that 20% of the value added by teachers to student learning was attributable to shared expertise, more than 90% of teachers thought teacher networking improved their teaching, and 75% thought it helped improve their schools.

The benefits of teacher engagement and risks associated with 'private practice' by teachers have been recognized for decades. Because schools are characteristically arranged with teachers working alone with children in a classroom, teaching has the potential to be an isolating profession (Lortie, 1975). Therefore, teachers readily fall back on memories of their own education as a guide to practice. Hargreaves (2010) reflected on the continuing relevance of Lortie's argument that educational improvement has been impeded by individualism, presentism and conservatism of teachers. The isolation of teachers' work reinforces individualism and the value they place upon autonomy. Presentism, the tendency to focus on short term goals, discourages working with colleagues to effect improvements. Conservatism encourages a preference for continuing with past practice. Hargreaves concluded that these factors continue to restrict improvement in education despite efforts to encourage more collaboration among teachers.

Activities associated with OER and OEP represent one potential expression of 'professional practice' by teachers (Becker & Riel, 2000) but, as indicated by Hargreaves (2010), the challenge is to encourage teachers to engage in more open and collaborative practice. Belland (2009) drew on the theory of *habitus* to explain challenges in moving teachers toward technology integration, arguing that teachers replicate personal experiences of education, a reflection of the conservatism noted by Lortie (1975) and Hargreaves (2010). Belland suggested that change might be effected if teacher education programs offered experiences with technology integration that were broad and deep enough to overcome the experiences from 12 years of schooling. Jones (2012) observed that PST habitus in relation to assessment frames expectations of faculty and peer behaviors, and may constrain innovative and collaborative praxis.

Hence, moving teachers toward OER and OEP faces similar challenges: even where educators are professionally engaged it is likely that is largely invisible to learners in school or university. The focus of education is almost always on the finished product of assured knowledge rather than the often messy processes by which it is achieved (Bigum & Rowan, 2014). The public view of teachers' work is often that they work relatively short hours entirely in their classrooms and any broader activity for preparation, professional learning and sharing is effectively invisible. It is

likely that most PSTs enter their preparation with a similarly restricted set of beliefs and, unless teacher preparation programs take steps to disrupt that habitus, it may limit their future professional practice.

There is reason to think that conventional education, including teacher education, does little to encourage open and collaborative behavior and may actively discourage it. Assessment typically depends upon the individual outputs of learners in formal examinations or assignment work. Where group work is required it is often resented or resisted (de Hei, Strijbos, Sjoer, & Admiraal, 2016) perhaps because PSTs do not trust colleagues to contribute equal effort at a standard they are comfortable with. Moreover, the reuse and remix of artifacts that are pivotal to OER are discouraged or penalized under the labels of plagiarism and collusion.

Thus, if teacher graduates are to engage in OEP, it is important for teacher education to engage PSTs in experiences that promote an open and collaborative view of teacher 'professional practice' including OER and OEP. The remainder of this paper will consider how progress with OER and OEP might be characterized and tracked, evaluating some past and present practices against those criteria, and considering what steps may support the modeling of OER and OEP in ways that increase prospects of graduating teachers to engage in more open and collaborative practices.

Frameworks for understanding OER and OEP

As noted above, 'open' has been used as a descriptor for a wide variety of initiatives and with many different meanings. Pomerantz and Peek (2016) adopted 'fifty shades of open' as an amusing working title but eventually found at least that many terms using 'open'. These commonly draw on concepts of freedom but the wide variation in meanings challenges those using the terminology of 'open' to clarify both terms and intentions. The status of 'open' as a fashionable marker has resulted in 'openwashing', the use of 'open' to describe things that really are not open. Although this presents risks for the unwary, Pomerantz and Peek suggest that it may ultimately benefit the field as criteria for 'open' are clarified in response to inappropriate use.

		OER Usage		
		Low No OER (re-)usage	**Medium** OER (re-)usage or creation	**High** OER (re-)usage and creation
Learning Architecture	**High** Social practices, Collaboration, Sharing (Reflection in action). • 'open' objectives • 'open' methods	A	B	C
	Medium Dialog, Procedures, Rules (Know-how). • 'closed' objectives • 'open' methods	D	E *Increasing OEP*	F
	Low Knowledge transmission (Know-that). • 'closed' objectives • 'closed' methods	G	H	I

Figure 1: Constitutive Elements of OEP (Ehlers, 2011)

The Open Educational Quality (OPAL) Initiative was a major international project that collected data about OER use and promoted future action focused on innovation and quality through developing OEP (Andrade et al., 2011b). It recognized that, despite success with making OER widely available, actual uptake and use was limited. To move beyond this first phase would require a second phase of activity characterized by moving beyond access into learning architectures, focusing on learning as construction and sharing, improving quality through external validation, changing educational cultures, and offering OER as a value proposition for institutions (Ehlers, 2011). Figure 1 reproduces a matrix described by Andrade et al. (2011a) to represent the link between OER and OEP. The horizontal

represents different levels of openness in using and creating OER while the vertical represents stages of openness in pedagogical approach. Practice becomes more open as it moves from bottom-left toward top-right.

Actual practice of educators or institutions might fit in any of the nine zones visible in Figure 1. Ehlers (2011) suggested some examples. For one, OER (a slide set or video) might be used to support lecture presentation in a traditional knowledge transfer mode in zone H or I. Alternatively, learners might engage in independent projects without using or producing OER in zone A but a modification of that practice to include use of OER or sharing OER products produced by learners would move practice toward zone B or C. By examining example practices and positioning them on the matrix it should be possible to trace progress toward increasing OEP. Coughlan and Perryman (2015) described this OPAL 'open educational practice maturity index' as the "dominant OEP analysis framework" (p. 177) but found it necessary to supplement it with another tool when considering collaboration.

Ehlers (2011) suggested a second matrix to be used for examining the diffusion of open educational practices within an institution. In that matrix the horizontal dimension was based on the degree of involvement of others in the OEP as manifested in sharing or collaboration while the vertical dimension recorded degrees of individual freedom to practice OEP within the institution. That matrix would be a useful tool for considering development of OEP across an institution. It is less relevant here because the focus is on individual examples of teacher education practices and the degree to which they represent OEP. The goal is to learn something about how teacher education might be moved toward developing more open and collaborative professional practice among graduates.

A recent effort to develop a tool for evaluating progress toward OEP (Stagg, 2014) reviewed the literature and proposed a continuum of open practice against which practices might be evaluated. It represented the continuum as shown in Figure 2 and provided examples of practices that might appear at each stage. At the first stage OER the behavior is essentially consumption with OER being used to support instruction, possibly replacing other material, but without sharing original or adapted resources. Such practice is similar to the first example described by Ehlers (2011) in zone H of the matrix. The other end of the continuum corresponds broadly to zone B or C in the matrix with learners contributing to the adaptation and/or creation of OER. The remaining stages in Stagg's continuum correspond to sharing a locally created original resource, modifying a single OER for local context, and blending multiple OER for enhancement. Depending on details of implementation they would fit in intermediate zones within the matrix.
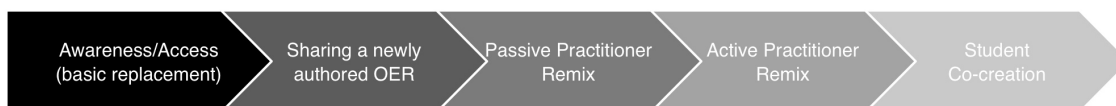

Figure 2: Continuum of open practice (Stagg, 2014)

It is tempting to overlay the continuum (Stagg, 2014) to follow the arrow of increasing OEP on the matrix (Ehlers, 2011) but the immediate fit is somewhat awkward because the continuum begins with some use of OER and, using the current descriptions in the matrix, must fit in the second and third columns since the first (Low) column is described as 'No OER (re-)usage'. There is a semantic contradiction between 'Low', which implies something is present to a limited degree, and 'No', which implies its complete absence. That might be resolved by amending the description in the low column of the matrix to 'Un-adapted use of OER' or similar.

If that adjustment is made to the matrix, it becomes possible to anchor the end stages of Stagg's continuum to the bottom-left and top-right zones of the matrix as shown in Figure 3. The first stage corresponds to accessing and using OER to support traditional teaching. In the final stage teacher and learners produce and share OER perhaps by remixing. The remaining stages may be difficult to place on specific zones in the matrix but would be associated with some intermediate mix of pedagogy and use of OER.

The framework in Figure 3 is not without problems for interpretation but the combination of matrix and continuum offers a basis for examining how the practices of teacher educators have progressed toward OEP. As noted previously, graduating teachers inclined to open and collaborative 'professional practice' will be facilitated by teacher education programs that expose PSTs to OEP. Understanding the extent to which current practice is tending toward OEP is a valuable step toward increasing the prevalence of OEP in a teacher education program. Hence this paper will proceed by describing some examples of teacher education practice and evaluating them against the framework in Figure 3.

		OER Usage		
		Low Un-adapted OER usage	**Medium** OER (re-)usage or creation	**High** OER (re-)usage and creation
Learning Architecture	**High** Social practices, Collaboration, Sharing (Reflection in action). • 'open' objectives • 'open' methods	A	B	C
	Medium Dialog, Procedures, Rules (Know-how). • 'closed' objectives • 'open' methods	D	E	F
	Low Knowledge transmission (Know-that). • 'closed' objectives • 'closed' methods	G	H	I

(Arrow overlay labels, from G to C: Awareness/Access (basic replacement); Sharing a newly authored OER; Passive Practitioner Remix; Active Practitioner Remix; Student Co-creation)

Figure 3: Continuum of OEP overlaid on adapted matrix (after Ehlers, 2011; Stagg, 2014)

Tracking progress with OER and OEP

The examples presented here are drawn from courses designed and taught by one or other of the authors over a period of years. The courses were taken by undergraduate PSTs studying at the University of Southern Queensland, Australia, an institution with a long history in using distance education, but which has since moved strategically into online learning (Albion, 2014). The courses were not designed to explicitly implement OER or OEP. They are not presented as exemplars, but rather to illustrate practices that embody some of the spirit of openness inherent in OER and OEP. By reflecting on how they fit with the framework we hope to extract lessons for our own future practice as teacher educators and for teacher education more generally.

A core third-year course of the Bachelor of Education (EDC3100) addresses integration of technology for learning and teaching and includes activities that exhibit some characteristics of OEP. It is taught twice a year with over 400 students each year, two-thirds of whom study online and not on-campus. The core activity for both on-campus and online students is a weekly learning path that directs PSTs through a sequence of resources and activities described as a *ramble*. Rather than following a constrained path to a fixed destination, PSTs are given a broad direction to follow with recommended stops and suggestions for other points of interest. They are encouraged to post reflections to their blogs as they participate. More recent iterations have been extended with Diigo (diigo.com) widgets that initiate explorations of people or resources online and reflections that are shared back so that they become part of the ramble for subsequent students. Although the institutional LMS (Learning Management System) does not permit open sharing of the learning paths beyond the course, the activity does engage PSTs in setting their own objectives, sharing the experience with colleagues, and collectively modifying the paths. Thus, it sits within zone A or B (Fig 3) and has some characteristics of stage 5 (Stagg, 2014) through the co-creation of the resource with learners.

Institutional systems such as an LMS are developed and maintained for reliable access to safe and secure environments supporting conventional courses. A safe environment for learners is typically interpreted as requiring stringent limits on outside access. That makes sharing artifacts and other open practices awkward or impossible. Instructors seeking to engage in more open practice may find ways to circumvent restrictions by using external services (Jones, Albion, & Heffernan, 2016) such as Diigo in the previous example. Diigo is also used in EDC3100 for its ability to annotate webpages (OER) assigned as readings and make those annotations available to others who visit the page using Diigo. Thus a 'residue of experience' is accumulated and passed between offerings of the course. This practice might be placed in zones B or E on the matrix but the contribution of students as co-creators is a stage 5 practice. Another of our courses also uses Diigo to share online resources through the social bookmarking facility. Instructor and students can bookmark interesting sites and use a course tag to make them available to others through a feed linked to the tag. Resources shared using Twitter are also marked using a hashtag and tagged items from both Diigo and Twitter are fed

through the LMS to increase their accessibility to students. These practices that use and share OER but seldom modify them may to fit in zone A. They are difficult to place on the continuum but may be in the middle stages.

Limitations of the LMS and other institutional systems have also driven the decision to encourage students in EDC3100 to use open blog sites for reflections on the weekly *rambles*. Using an aggregator and a Moodle module the instructor has made it possible for students to see the reflections of other students from the same or previous offers. The *rambles* evolve through co-creation by students as they are overlaid by reflections and modified for subsequent offers based on student response. Although that interaction occurs in the open, the rambles themselves are not directly shared because of limitations in the LMS and the highly contextualized nature of their content in relation to the course, which would limit their usefulness in other contexts without substantial modification. The rambles represent OEP in zone B or E because, though the actual resources are confined to the LMS, the activity around them is in the open, they encourage learners to adopt their own objectives, and have an element of co-creation appropriate to stage 5.

Another undergraduate course (EDP4130) addressing the teaching of the *Australian Curriculum: Technologies* (ACARA, 2015) has engaged PSTs in activities that have characteristics of OEP (Albion, 2012; 2014). For its first offer in 2011, EDP4130 drew on a previous course (EDU1471) that used the relate-create-donate model (Shneiderman, 1998) to engage PSTs in a class project in which they created a pool of teaching resources that they shared with the rest of the class but not beyond in the first instance. Resources obtained from the web provided inspiration and starting points. Subsequent offers of the course placed more of the materials on the web where they could potentially be accessed by others beyond the course but there was no organized effort to promote such use. All students in EDU1471 had been enrolled in on-campus classes. By 2011, however, when EDP4130 was first offered, a substantial proportion of students enrolled online and collaboration on resource development posed challenges for them. Nevertheless, all groups published resources on websites that are still available, though probably little used. In 2012 students attempted a similar task individually or in small, self-selected groups with reasonable success. Collaboration was facilitated using an online space dubbed the Virtual Learning Design Studio where students could share and comment on work in progress. In 2013 and 2014, the focus shifted to curation using the seek-sense-share model (Jarche, 2012) with students required to locate teaching resources on the web and curate them in a publicly available space. At least some of those collections are still available but do not appear to have been updated since the course finished. In 2015 and 2016, the major assessment task returned to developing teaching resources and making them available on the open web. A peer review process was introduced to assist with quality assurance and a directory page with links to more than 300 teaching resources was created and promoted via Twitter and elsewhere. Because these activities result in open sharing of resources created or adapted by PSTs, engage them in collaboration, and allow some choice about specifics they can be placed in zone C and stage 5 (Ehlers, 2011; Stagg, 2014).

Lessons from experience

Although both the matrix and spectrum as shown in Figure 3 were helpful for guiding reflection on the examples described above, neither enabled easy unambiguous placement of activities in categories. Each of the examples, even when they were part rather than whole of a course, included multiple elements that fit in different categories or lacked some characteristic highlighted in the tools. That is not necessarily a deficiency in either of the tools or in the examples, but is simply a reflection of reality which is more complex than idealized models. In their use of the OPAL matrix Coughlan and Perryman (2015) found similar difficulties in matching examples to categories and found it necessary to add another model to reflect some aspects of their examples. Both tools used in preparing this paper may be at least as helpful as guides in the process of developing OEP as in evaluating existing practice.

Because the examples are based on recollections of regular teaching in courses there was no formal collection of data from PSTs. Based on observation of the activity in courses and work submitted for assessment, it is fair to say that the responses of PSTs to their experience of OEP in the courses was varied. Most of the activities required them to engage with unfamiliar software or processes (blogs, Diigo, Twitter, curation tools, website development) which sometimes stretched their capabilities and added to the challenges they experienced.

Being "open" in EDC3100 had two main challenges. PSTs struggled with unfamiliar technology and understanding how their blogs were to be used to share the messy process of coming to terms with new knowledge. Experiences within formal education had enculturated them into valuing and focusing on the tidy presentation of knowledge

(Bigum & Rowan, 2014). Perhaps the most common question about the blogs was "Why are we doing this?", an indication that they lacked familiarity, as either participants or observers, with the ongoing professional conversations that characterize open and collaborative practice among teachers.

In EDP4130, developing a shared pool of teaching resources for a new curriculum was identified as a relevant activity but the openness of the task specification challenged PSTs who were focused on the requirements of the final product for assessment and wanted tight specifications for success. Encouragement to share work in progress caused some to express concern about colleagues using their ideas but the peer review of near final drafts was widely appreciated for its value: peers' work became a source of ideas and peer feedback identified gaps in their own efforts prior to assessment. One notable feature of the online resources shared by PSTs was that almost all were presented on free hosting services (e.g., wix.com, weebly.com, wordpress.com) using sites newly established for the purpose. Very few were presented as additions to existing 'professional' sites, suggesting that final year PSTs had not established a regular online presence outside social media. This has significant implications for their progression to open and collaborative 'professional practice' (Becker & Riel, 2000) as graduates.

Much of the value of OER and OEP is in the rights of users to reuse, redistribute, revise, and remix (Wiley, 2010), content typically governed by Creative Commons (CC) licenses (creativecommons.org). Both EDC3100 and EDP4130 include information to assist PSTs with identifying resources that permit appropriate use but there are occasional issues with use of copyright or other restricted resources. Although EDP4130 guides PSTs toward using material with CC licenses it has not required PSTs to explicitly apply a CC license to material they produce, even when that is a requirement of a 'share-alike' (SA) license that applies to a resource they are reusing. Given the automatic application of copyright to published material, that omission is problematic because PSTs may be unwittingly breaking the terms of SA licenses and restricting the rights of users of the resources they share. More needs to be done to ensure that the OEP in which PSTs engage is more complete.

A path forward

Noting that these examples are drawn from the third and fourth years of a teacher education program and there is little evidence that PSTs have developed persistently open and collaborative approaches to their work, it seems clear that piecemeal adoption of OEP within individual courses will not achieve the goal of graduating teachers prepared for open and collaborative 'professional practice' (Becker & Riel, 2000). Steps that might be considered for moving forward on the journey to more OEP in teacher education and thence in the profession include:

1. Adopt a global or holistic approach to embedding OEP across the teacher education program to achieve a shift in *habitus* (Belland, 2008) from an orientation to 'private practice' to one of 'professional practice'. Open activities should be used at all stages in the program if not all courses and barriers between courses might be reduced by sharing open activities across multiple courses.
2. Rethink assessment to de-emphasize grading of finished products and pay more attention to the processes and thinking around development through 'public click pedagogy' (Bigum & Rowan, 2014). Such a shift would open possibilities for encouraging visible collaboration and thereby reduce the perceived risk of collusion.
3. Adopt institutional technologies and processes that facilitate OEP. Initiatives such as *A Domain of One's Own* as initiated at University of Mary Washington (Kehoe & Goudzwaard, 2015) enable students to reclaim their digital identity outside the control of social media platforms and would facilitate development of unified professional presence in place of the fragmented approach described above.
4. Integrate open activities within the teacher education program with the wider profession so that PSTs become valued participants in professional networks prior to graduation and develop the *habitus* that will enable a smooth transition to long term 'professional practice' (Becker & Riel, 2000).

If it is permissible to dream for a moment, then perhaps a way forward might be found through the planning process in which all teachers must engage at some level. Many planning templates can be found on the web but most are clumsy at best and offer no support for OEP. Would an approach to planning templates that enable a raft of acceptable open practices around lesson planning, implementation, evaluation, and reflection offer a useful path toward OEP? Such a template might offer active assistance and connections to a range of OER and networks of support. It could allow others to annotate, evaluate, remix, and repurpose planning in open ways. If PSTs were able to engage with such a system throughout their teacher preparation, then they would graduate already enculturated into open and collaborative 'professional practice' with a clear path toward ongoing development of OEP.

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