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Open Education Research: From the Practical to the Theoretical

*Patrick McAndrew and Robert Farrow,
Open University UK*

The Distinctiveness of Open Educational Resources

Open Educational Resources (OER) remove restrictions for learners and educators by their nature. OER are free of direct cost to the end user and, in most cases, are openly accessible online. The recent growth in interest in OER has several drivers, ideological, political and economic, none of which in itself explains how learning will be supported or help us to develop effective models and learning design. Looking at existing approaches that are taking OER from resources into practice and at some of the theories for learning that have been proposed in recent times, we can see that OER offer attractive affordances for the expansion of formal education and for the support of informal learning.

The potential impact of OER can be illustrated by an example. In the Bridge to Success project (Lascu 2011), OER release of content from the Open University UK is being re-used within U.S. community colleges. Even though full pilots have yet to complete, it is already possible to determine interesting patterns in the enthusiastic commitment to the content by more than 20 colleges. The OER nature of the content is helping bridge a variety of gaps in the formal provision, such as the pause between registration and start-up inherent in cohort-based courses and the need to break the cycle of failure and retake in assessment-focused courses. This shows that OER can support the adoption of *less* formal approaches into formal structures.

There is also evidence of the reverse in action. Courses with a formal base from mainstream Open University courses released through OpenLearn are being adopted at scale as the basis for informal learning. Users take advantage of the ability to follow their own path by picking aspects from within structures or by using the content as the trigger for social learning around the content within informal learning groups that sit alongside the attraction of the

content base (Godwin and McAndrew 2008). The social element also comes to the fore in the case of OpenStudy (2012), which focuses on solving one problem: Where can learners talk to other learners about topics raised by OER? OpenStudy offers other sites the opportunity to embed or link in to a unified place for discussion, and for learners it gives the critical mass of enough other people talking about the subject in which you are interested. In this model, attention moves from the resources themselves to the structures and social connections around the content, with the questions that people are asked to solve becoming the driver.

The Challenges for OER

Progress for OER is visible in the expansion of the approach, but clearly challenges remain. Some of these can be identified in the work of OpenLearn which, in 2006, set out the aspects it could meet in terms of six different stages (Lane 2009; McAndrew et al. 2009). Reviewing first the six stages identified by OpenLearn, we will see how the maturity identified by the project in 2006 (as a result of building on five years of OER experience) has continued with the consequence that we can start to feel ready to fulfil the promise of OER.

Six Stages of OER (OpenLearn Model)

When establishing OpenLearn, a six-stage description of possible work was developed:

1. Legal: release of copyright through Creative Commons
2. Practical: provide access to content
3. Technical: develop an environment for open access
4. Pedagogic: understand the designs that work
5. Economic: devise a model for sustainable operation
6. Transformative: change ways of working and learning

In the first two of these, legal and practical, OpenLearn was able to build on considerable existing work. In the legal area, adopting the Creative Commons licence gave a shared legal framework that has now become the dominant method for signaling the intent that resources are open. At a practical level, the first wave of open projects (e.g., Connexions from Rice University, Carnegie Mellon University's Open Learning Initiative, and MIT's OpenCourseWare) had established the identity and expectations of access to openly licensed material.

The third and fourth stages — technical and pedagogic — have been addressed to a lesser extent in earlier initiatives where the primary aim was to achieve the open release of material. For OpenLearn, an important change from embedded content-specific tools to an overarching environment of learning and sense-making tools was devised, using an open source learning environment (Moodle), enhanced by custom tools. This meant that OpenLearn could offer a chance for self-study embedded in a supporting site, rather than transfer of materials.

Pedagogically, materials in OpenLearn start from a basis of distance learning. It was recognised, however, that these could not necessarily be made available in the form that was already provided to registered Open University students, but rather be made to act more as “Learning Objects” (Rehak and Mason 2003). The structuring of material for OpenLearn built on work done into structured authoring and learning design (McAndrew and Weller 2005).

The fifth stage considers models for sustainability and takes a broad approach to the economy of openness. OpenLearn was an experiment and so did not have to meet any particular targets. However, it also intended to understand the economics of operating openly by being attentive to the opportunities that could arise. These included attracting further funding to projects that need to disseminate and share their materials, attracting new learners, and bringing in new content for existing courses. OpenLearn’s continuance was supported across a range of benefits identified during its experimental period (McAndrew et al. 2009). However, it also has a basis in a straightforward financial position that the additional costs, once processes can be embedded in existing practice, can be justified by the financial return through increased economic activity.

The final stage of the OpenLearn model (transformation) was not felt to be something that could be required of a time-limited intervention. So, in that sense, it was seen as beyond the scope for OpenLearn. However, we find a rationale for further action in the demonstrated potential of OER to act as an agent of change.

As OpenLearn progresses to be an integral part of the Open University, it is clear that adopting OER has had a wide-ranging influence, changing the way that the university collaborates with other organisations and having significant impact on mainstream production techniques and on approaches to research. As a result of some of the lessons learned from OpenLearn, the Open University has developed a broader understanding of business models and has demonstrated a willingness to experiment with alternative ways to offer mass learning beyond its existing student base. While it needs to be considered alongside other economic and structural factors, openness has offered a way to respond constructively in a period of change and so has a reasonable claim to have been transformative: a recent internal review of the major grants received by the university identified that in all but one of those grants there was at least some dependence on OER, and that the ability to operate as a provider of open and free resources is now part of the university’s identity.

This six-stage OpenLearn model is ordered to imply a growth from practical issues to greater impact. In reality, there is a mix across all the stages of different needs and ways to meet them. If it is genuinely the case that OER have particular abilities to support transformation in education, then we need to understand how to enable that aspect. At the *macro* level, this is about finding support for two main contentions. Firstly, that OER contain transformational elements; and, secondly, that these elements are of some educational merit. We propose to examine the former claim in light of the practical challenges facing the OER movement and the latter by assessing the extent to which OER can be understood to be aligned to particular educational philosophies.

Twelve Key Challenges of OER (OLnet Framework)

The Open Learning network (OLnet) was established in 2009 with an aim to collate evidence and encourage research into the development and practice around OER. Taking a multi-strand approach a repeated element within its work has been to iterate through reviews of the priorities emerging from literature, key stakeholder interviews, analysis of online sites and studies of OER project reports. Through the collective intelligence research strand, the data gathered has been entered into the OER Evidence Hub (OLnet 2012). The Evidence Hub provides an open online environment which scaffolds and structures debates around key questions for the OER movement. By aggregating and mining individual contributions, it has been possible to isolate the main issues that the OER community feels are important, and to identify potential solutions that might help overcome any legislative, cultural or practical barriers to mainstream OER.

In late 2011, a message was distributed (De Liddo 2011) asking for community feedback on ten challenges that had emerged (including data from the OpenLearn project). Following consultation, the challenges have been refined (and extended) to become 12 “key” challenges, as follows:

1. Who and how to create new appropriate **Assessment/Evaluation** models and practices for OER?
2. What **Technologies and Infrastructure** are needed/in place to help the OER movement?
3. What **Institutional Policies** are needed/in place to promote OER?
4. What evidence is there of **Use (and Re-Use)** of OER?
5. What can be done to improve OER **Sustainability**?
6. What are the issues surrounding **Copyright and Licensing**, and how can they be overcome?
7. What are the costs and benefits of using OER in **Teaching**?
8. What are the best ways to **Promote and Advocate** educational methods which use OER?
9. How do we ensure OER is of high **Quality**?
10. How do we create the right culture of teaching and learning to improve OER **Adoption**?
11. How can we improve the value and impact of OER **Research**?
12. How can we improve **Access** to OER?

(Given the dynamic nature of collective intelligence, these challenges may extend further. The latest version can be found through olnet.org and ci.olnet.org.)

The challenges facing the OER movement are diverse, but also fall into four categories (Figure 5.1).

Figure 5.1: Categorisation of key challenges facing the OER movement.

1. Persistent challenges	2. Underlying challenges
Copyright	Cost/benefit
Technology	Impact
Access	Policy
3. Sticking points	4. Emerging challenges
Quality	Advocacy
Sustainability	Culture
Re-use	Open assessment

- The first category contains challenges relating to copyright, technology and access. These are the most **persistent** questions, but also those where we can suggest solutions.
- The second category contains key **sticking points**, namely those of quality, sustainability and re-use. These can be considered barriers as the existing models and measures do not easily transfer to the open context. The open approach is interesting precisely because of the challenge to those models and the spur to rethinking that it brings. In this sense, the sticking points are distractions and will only ultimately be addressed through experience.
- The third category is of **underlying** challenges of cost/benefit, impact and policy. Here, OER offer a new dimension and the role of individual pieces of evidence is critical. Applying research to these challenges has particular potential to increase understanding and take-up.
- In the fourth category are the **emerging** challenges of open assessment, culture and advocacy which reflect the contemporary issues faced by the movement.

The OER Evidence Hub is a tool that was designed with the real needs of the OER community in mind. While there are a plethora of normative arguments in favour of OER, evidence about OER is somewhat harder to come by. Keeping in mind the diverse ways in which OER are remixed, redistributed and used, evaluating and modelling the use of OER are not always straightforward. The Evidence Hub is a tool which enables the community to make sense of fragmentary evidence and assess the validity of claims and questions facing the movement as it enters a new phase of maturity.

Is the “Resources” Part of Open Educational Resources Solved?

As stated above in reviewing the challenges, some of the main issues facing the movement may be considered to have largely been solved (at least in principle). When OER first became an object of attention in the early 2000s, they also became a focal point for the various discourses surrounding open education (distance learning; learning objects; open source software; copyleft; etc.).

As a practical issue relevant to a range of different stakeholders, copyright offered a natural point from which advocates of open education could explore, discuss

and argue for change. The successes of the (often diverse) OER movement have depended to a certain extent on a sense of purpose and frame of reference that could be shared across international and institutional borders.

The importance of Creative Commons (2012) in creating a culture of confidence and legal awareness shouldn't be understated. As Atkins et al. (2007, p. 13) note, the range of licensing arrangements supported by Creative Commons is an important part of the international infrastructure of the OER movement — a movement that continues to grow all around the world. This growth is undoubtedly supported by the relative ease with which educators, producers and remixers can manipulate and share OER through Creative Commons licences. One consequence of the success and impact of the work of Creative Commons is that practical questions about open education are now typically framed in terms of OER. Conversely, OER in turn are still generally defined in terms of copyright and licensing.

There have been some attempts to widen the scope and definition of OER beyond copyright status. For example, Wiley (2011) has argued that OER are artifacts that are either (1) licensed under an open copyright licence or (2) otherwise in the public domain. It is worth noting two things that appear to follow from his proposal. Firstly, it means that OER are a subset within a wider taxonomy of “things that can be copyrighted.” Copyright is designed to protect individual works of authorship that have received some sort of fixed expression (like a book, DVD or webpage). Thus, copyright covers intellectual and literary works, but ideas, concepts, methods, people, places and events can never be copyrighted. Secondly, by including public domain, Wiley suggests that, irrespective of copyright circumstances, something being in the public domain is itself enough for a resource to be considered “open.” Arguably, this would entail the possibility that ideas, concepts and other forms of work that are not considered in law to be capable of reaching a tangible expression could be considered OER when they exhibit adequate senses of “publicity.” Licensing remains the least contentious and most practical way of identifying OER, and the convention (perhaps derived from the influence of funding bodies) is that educational resources are considered open when they are produced or released through the appropriate “open licence” (see Chapter 6).

In practice, most educational resources exist somewhere on a scale of ease of access and amenability of re-use. This depends on many factors, including the format (not necessarily digital), the legal context, who is trying to access it and the nature of the intended use. The “openness” of a particular OER is also contextual, and not necessarily a feature of the resource itself. The open education movement needs a better understanding of these contexts and the ways that practices surrounding the use and re-use of OER are having an impact on educational institutions. The debate around these issues is often framed in terms of “Open Educational Practices” (OEP).

Open Educational Practices

The boundaries of the debate around open education are increasingly expanding in order to encompass the institutional, cultural and pedagogical implications of adopting an open model rather than retaining focus on the resources themselves. For each of the 12 “key challenges,” there are many areas where OER have the potential to challenge existing institutional structures and ways of working. We will discuss just three aspects here, but there are others we could have chosen,

such as curriculum design, sustainability, research, dissemination, recognition and attribution. As each of these examples indicates, the shift to the open model of education entails changes much more profound than simply amending the legal status of a particular educational resource. OER can throw into question the validity of existing institutional systems.

Thus, as the OER movement enters a new phase of development, the values and practices associated with being “open” are coming to the fore. In a recent poll organised by the World Summit on the Information Society (WSIS) Knowledge Community, for example, 75 per cent of respondents expressed the view that “mainstreaming the use of Open Educational Practices (OEP) will really transform education” (WSIS 2011). (Interestingly, there was a suggestion that those who disagreed may have done so on the basis that “OER alone would not be enough to transform educational practices” [Johnstone 2011].)

Assessment and Evaluation

The production of OER content may be less pressing than the question of how to connect the wide range of existing content through to learning activities. Learning is a complex process with the “pain” that is part of acquiring new knowledge balanced by the “pleasure” of building extra understanding once grounding is available. There are motivations that come from individual goals and social connections, but what is also clear is that the addition of external assessment can be the catalyst to turn intentions into motivations and structure them into effective learning.

Lack of a viable assessment model is a central issue for a number of OER providers who operate outside (or parallel to) traditional educational institutional boundaries, including Peer 2 Peer University (<https://p2pu.org>) and Khan Academy (www.khanacademy.org/). The Massachusetts Institute of Technology (MIT) recently announced its intention to expand the successful OpenCourseWare programme and offer certificates to students who complete the course. The new MITx programme will not involve any charge as such, although learners who wish to have their progress accredited in some way will have to pay a fee (MIT 2011b). Furthermore, MIT will not itself be the awarding body for any credits earned through the OER model. The disaggregation that is a possibility of OER offers a potential solution illustrated by the plans of the OER university (OERu 2012) to establish a consortium of universities that will accredit learning from OER.

Do strategies such as this make education more “open”? On the one hand, well-designed learning materials are being made available to a wider audience, but one could also argue that tiers of accessibility are being re-introduced despite the open nature of the resources themselves. One popular option for accreditation is provided in the form of a digital badge system, recently praised as the future of learning by the U.S. Secretary of Education, Arne Duncan. Badges, he suggested, hold the key to recognising non-traditional learning and skills developed in informal settings, empowering students and marking personal development. But even the most optimistic assessment of the badge system must acknowledge that context is crucial: the badge system cannot work without an open educational infrastructure (Duncan 2011).

Technological Infrastructure

One of the central challenges faced by the OER movement is the development of an infrastructure that can support the distribution and use of digital resources through workflow and course management, provide tools for dealing with copyright and re-use of materials, and aspire to ensure pedagogical quality. In practice, this has perhaps proven to be much more complex than first appreciated. Reflecting on the eduCommons project, Atkins et al. (2007, p. 12) noted:

“The philosophy of the Center for Open and Sustainable Learning team is that all resources emitted by eduCommons should be covered by an educational Creative Commons license.... This philosophy suggests that two different digital course resource systems would emerge within a university: one built entirely of Creative Commons material, and another built within the IP environment of the institution’s digital library/repository allowing access to copyright material only to authenticated members of community.”

The emergence of parallel systems for formal, institutional learning and informal general learning reflects the tensions that govern the use of OER within institutions. While OER are not dependent on any one technology, an ideal solution to meet their various requirements has also been lacking. The ideal platform for the providers of OER should: offer multiple content; input and multiple content output formats; support clear licensing; track all use of the content; provide easy tools for customisation and sharing back; enable very easy resource discovery; and reveal the options for how the resources are intended to be used and how they actually are used. For users, one of the key requirements for OER is its invisibility as part of the range of resources they would use. This means that OER need to be flexible across context, linking through to other relevant content and assessment as required. Under this view, the ideal platform is not something that can be provided just for OER: resources need to be thought of as elements that are continuous with the rest of the learning environment.

Weller (2011) has pointed out the interesting distinction between “big OER” and “little OER” in his book *The Digital Scholar*. His distinction is based mainly on the origin of a particular resource. Big OER mean funded projects, institutions and collaborations that, in turn, tend to produce big products, such as modules, learning environments, lectures, textbooks, courses and pilots. On the other hand, little OER relate to the individual and the community with learner-generated products such as images, presentations, video clips and notes. The distinction also reflects the impact that OER can have in the “big” world of universities, education systems, funding organisations and governments, and in the “little” world of tutoring, homework help, informal education and learning for fun. The reason that OER can make a difference is reflected in this broad range of impact. The “openness” of OER means that what a university releases can be picked up in any way that suits the user. Indeed, big OER can appear to people who come across it as the ideal solution to their “little” problem because a more complete and structured solution may be better for the learner than isolated components (i.e., little OER).

Research and Scholarship

A third area where OER challenge existing institutional models concerns the production and consumption of research. The majority of scientific papers are still published by traditional journals whose business models prohibit the use of an open system. While there are many compelling reasons why academic and research leaders should publish on an open basis in order to offer the widest access to their work, the central role of prestige publication remains in acquiring academic tenure and recognition. The message that is still often handed down from senior staff to early career researchers is that it's better to concentrate on traditional publishing routes, as these will be recognised as valid while publication in open access journals will not. The result is a bias towards print publication (Cheverie et al. 2009) and institutional cultures that do not reward openness.

Beyond the general idea of facilitating access, the values associated with open education have perhaps yet to receive full expression, although a number of researchers have written about the practical and ethical significance of OER. Angell et al. (2011) have identified the emergence of large-scale public health OER which are expanding despite the fact that public health involves the transmission of complex and rapidly changing information across different disciplines and is an area where high-quality learning is of paramount importance. Similarly, Heller et al. (2007), Ijsselmuiden et al. (2007), Geith and Vignare (2008) and Lee et al. (2008) have sought to connect the OER movement with discourses about public health and human rights in developing countries. In cases like these, OER are becoming part of a wider discourse about rights and social justice, which goes beyond simply promoting access (and may be seen to reconnect with the original aspirations of the open education movement).

It should be noted that being open is not the same thing as being against the commercial use of intellectual property in education. As Downes (2011) has observed, releasing materials under open licences can even provide less scrupulous commercial publishers with free content if they choose to disregard the spirit of sharing by making small changes and then claiming it as their own content.

In some ways, progress made in the OER world can be seen to have resulted from turning a blind eye to deeper questions about the impact of OER on institutional structures. Nonetheless, as the key challenges from the OER Evidence Hub (OLnet 2012) illustrate, the move towards OER provokes critical reflection about a whole range of changes for practices surrounding education. As the discourse about practical licensing of intellectual property moves on, debates now often focus on the practices (OEP) as a complement to the resources (OER).

OEP is defined by the International Council for Open and Distance Education (ICDE 2011) as follows:

“Open Educational Practices (OEP) are defined as practices which support the production, use and reuse of high quality open educational resources (OER) through institutional policies, which promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path. OEP address the whole OER governance community: policy makers, managers and administrators of organizations, educational professionals and learners.”

Similarly, the OPAL Open Educational Quality Initiative — a partnership between seven organisations led from University of Duisburg-Essen and including ICDE, UNESCO and the Open University UK — has suggested eight dimensions to OEP, based on a review of 58 case studies in open education (OPAL 2011a). Much of the support and commentary on OEP in this work is directed at educational institutions (OPAL 2011b), with a particular focus on aspects such as adoption, institutional sustainability and development of staff. This encourages a view that OEP are incremental rather than radical practices. Indeed, the ways that open education clearly transcends institutional boundaries and embraces informal learning scenarios is reflected in the emergence of non-institutional providers such as OpenStudy, Khan Academy and P2PU. Seen in this light, OER can be understood as radical objects that open up space for critical reflection on our most deeply held assumptions about the point and value of educational systems.

OER as the Supporter of Educational Theory

The OER movement emerged from the recognition that the Internet has great potential to change the way we live and learn, provided it can be harnessed for common good. It is questionable that OER exists as an independent approach. Rather, it can be seen as reflective of the evolving thought around education provision. Through the 20th century, there were a series of rethinkings of the way education can work (e.g., Dewey 1916; Ilich 1971; Vygotsky 1978; Piaget 1967). In the 21st century, the realisation is that there are now few barriers to the provision of these models. The free access to educational materials and tools allows us to revisit more radical ideas as to how learning might operate. Ilich (1971), in *DeSchooling Society*, envisions a learning web to “enable the student to gain access to any educational resource which may help him to define and achieve his own goals ... [from] Reference Services to Learning Objects....” While this may well have been suggested as a thought experiment at the time Ilich wrote his book, it can now be mapped on to achievable technology.

Equally, there have been arguments about the control structures that were intended through common curricula and assessment to bring everyone to a common standard as to whether those structures are any longer viable or desirable. The “learner as a compliant consumer” (Goodyear and Ellis 2007) that is needed for such control to work is not a reasonable assumption. We need to prepare for a more distributed and less restricted expectation of learner behaviour. To learners this may feel like abandonment and confusion as much as liberation and choice. The multiple paths they can follow mean that the expectations of the originator of the educational material and the users can no longer be seen as matched, and this has to be accepted as an increasingly common experience in the process of learning.

In this, the approach of OER resonates with the thinking of recent innovative educators. Bruner, for example, reached a position where he felt that progression of education, or at least the educational system, would be achieved by adopting the view that education was a function of “culture-at-large” (Bruner 1995, p. 84) and supported by interactions around attempts to co-construct knowledge. Thus, a world where learners can act directly and interact with others could help provide the ideal cross-over from the restricted models of teacher-based education to the more independent and holistic approaches envisioned. Those who draw on the

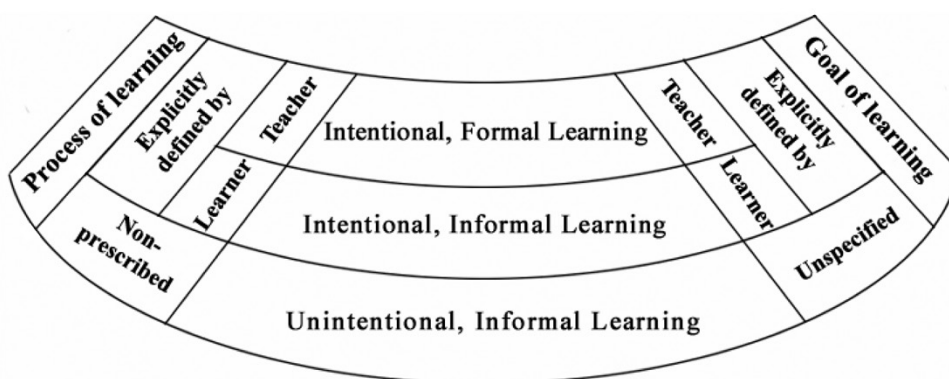
Vygotskian approach have identified the need for social connections as a key part of his once radical view that learning “is the very pathway through which human mind develops” (Stetsenko and Arieivitch 2010). The principle of Vykotsky’s “Zone of Proximal Development” is that by working alongside those of similar or slightly advanced skills, individuals are able to improve their own performance. This is scaled up in the open: limitations on finding peer learners are now unrestricted by location and geography.

Mayes and Fowler (1999) proposed a three-level view of “courseware”: the primary being the provision of resources themselves; the secondary, the work of learners with those resources; and the tertiary, the building of interactions around the work of the learners. The pedagogical mechanisms they describe for this overlooked tertiary level are dialogic and include passive, vicarious learning, through the observation of others as they work through challenges. In their original work, Mayes and Fowler considered the way in which the activities of students might be made available to following cohorts — in the open, the group who can see such materials extends and blends.

Vavoula (2004) makes a useful distinction between the process and goals of learning to provide a typology of informal learning that considers the role and source of the learning process and goals. As shown in Figure 5.2, she identifies:

- traditional *intentional formal learning* as being intentioned by a teacher who defines both the goals and the process;
- *intentional informal learning*, where the learner determines the goals and process rather than a teacher; and
- *unintentional informal learning*, where the goals and, indeed, the process remain imprecisely defined.

Figure 5.2: Typology of informal learning (Vavoula 2004).



Open resources are an enabler for all of these forms of learning because they provide resources that can transfer into formal contexts. It is their direct availability to learners that is their more distinct contribution. In the examples of OER in action, we can see both intentioned learning taking place (explicit outcomes specified, recognised and obeyed in the guided paths of P2PU and the transferred self-study materials from OpenLearn to Bridge to Success); and less directed, probably unintentional, learning taking place from the large numbers who land from Internet searches on individual OER pages or follow the distraction paths that lead from one online resource to another.

Conclusion

This chapter highlights the potential impact of OER on policy and on practice in education and points out that while there are weaknesses in the evidence base, there is a common position that allows progress. The way forward, then, is through finding a way to accept some of these partial pieces of evidence while making their basis clear and while understanding the contexts in which they can apply. Gathering such evidence will allow the OER movement to progress beyond practicalities and consider whether open approaches have the potential to support more innovative models of learning that have been proposed alongside the innovative models of operation.

The need to make connections in learning has influenced educational thinkers in recent times to go beyond individual teaching to the impact of culture and collective behaviour. Openness as a principle and as a practical mechanism is now giving us the ability to explore many of those ideas and offers an improved outlook for future approaches to learning.

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