

Open and Interactive Publishing as a Catalyst for Educational Innovations

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This paper reviews the educational value and innovative uses of open and interactive publishing (OIP) in learning design. OIP is defined in its broadest sense including all the emerging practices brought about by using open approaches and networked technologies to publish and engage with content. It explores two aspects of educational values and uses: (1) Open publications and scholarship provide new forms of open educational resources that stimulate innovations in learning designs and pedagogies beyond textbooks. (2) OIP is by nature a digital learning space whereby creative learners are able to learn from peers and communities through self- and social publishing activities. It also discusses the impact and challenges of OIP inspired innovations, from which practical recommendations are derived.

Keywords: open publishing, interactive publishing, OERs, learning design, learning space

A Review of Open and Interactive Publishing

Open and interactive publishing (OIP) primarily refers to open access to digital content and open licences that allow users to reuse and remix. It also means that an 'open' approach is adopted to the creation, distribution, and consumption of content based on creative end-users, democratic participation, and social networks, in which the boundaries between authors and readers are blurred (Ren, 2013). Moreover, crowdsourcing and users' collective intelligence play an essential role in filtering, assessing, and remixing content. Overall, OIP ensures 'that there is little or no barrier to access for anyone who can, or wants to, contribute to a particular development or use its output.'⁵ In the academic contexts, OIP could be an umbrella of many emerging publishing practices: open access scholarly publishing, OERs, self-publishing, academic blogging, scholarly social media, social referencing, open data, self-archiving, and crowdsourced publishing. Overall these open practices are creating new value propositions and driving genuine innovations through an emerging publishing ecosystem based on individual users' creativity and networked collaboration and transforming the landscape of scholarly publishing.

OIP is an essential intermediary and enabling technology for open scholarship. Boyer's classic model of scholarship (discovery, integration, application, and teaching) is being reconceptualised in the context of "open" (Ren, 2015). Veletsianos (2012) lists three specific forms of open scholarship in practice: (1) open access and open publishing; (2) open education; and (3) networked participation. Other researchers also try to redefine scholarship in the post-Web 2.0 environments, emphasising the increasingly essential role of co-creation, social networking and collaboration, for example, 'co-creating open scholarship' (Garnett & Ecclesfield, 2012), 'networked participatory scholarship' (Veletsianos & Kimmons, 2012) and 'social scholarship' (Greenhow & Gleason, 2014). Burton (2009) and Weller (2009) use the term "open scholar" to refer to the changing role and duties of individual scholars in the emerging open knowledge environment. Likewise, open access advocates argue that, academic maxims are shifting from "publish or perish" to "be visible or vanish".

OIP could be a catalyst for genuine innovations in teaching and learning. The full value OIP can yield is more than opening up the 'access' of content; rather, it opens up the whole process of knowledge creation and communication. It has significant potential to drive open educational innovations by new

⁵ The definition is based on the one developed by JISC CETIS, Wilbert Kraan, CETIS Assistant Director, <http://jisc.cetis.ac.uk/topic/open>

types of content and new models of knowledge production. Open education community needs to broaden visions beyond 'access' (or free content) and reinvent practices by harnessing the dynamics of OIP, which echoes the transformation from open educational resources to open educational practices (Ehlers, 2011).

This paper aims to systematically review and synthesise the role of OIP as a catalyst for innovations in open education, particularly inspired by the paradigm shift of publishing and scholarship. In the following sections, it focuses on two major aspects: (1) Open scholarship and open publications enabled by OIP provide new forms of open educational resources and stimulate new pedagogies and learning designs beyond traditional textbook teaching. (2) OIP is by nature a digital learning space whereby creative learners can learn from peers and networks through self- and social publishing activities. The dynamics, innovations, examples, challenges, and recommendations will be discussed. The paper ends by a critical reconsideration of the interplay between open Internet and institutional constraints in higher education, which shapes the adoption of OIP as well as other open praxis.

Open Publications and the Move beyond Textbook Teaching

Blyth (2009) criticizes commercial textbook publishing for inhibiting innovations and failing to create learner-centric and user-friendly (both learners and educators are users here) experiences and address their real needs. Likewise, Saravanan (2013) critiques the limitations of textbook teaching and pedagogies. They are just part of the increasingly strong voice of moving beyond traditional textbook teaching (Loewen, 2013). Open textbook plays a significant role in widening access and reducing students' cost. However, most open textbook projects have not transformed textbooks-based learning and teaching despite of licencing digital materials openly. The huge scale of new types of scholarship created by OIP has not been fully harnessed, including open access research publications, open data, user-generated-content, and so forth. There are significant opportunities to remix and repurpose open publications and open scholarship into new forms of textbooks that enable and inspire innovative pedagogies and learning designs. As such, the open education community might need to shift their priority from "big OERs" (Weller 2010) created by institutional projects with explicit educational purposes to broad open content in the Internet and explore its educational value innovatively.

Open Access Publications and Open Data in STEM Education

Open access has become a mandate in major public-funded research systems and most leading universities in the world. As a result, 27 million academic publications have been made openly accessible online (Khabsa & Giles, 2014). This open tAd is influencing research data management as well, making the original lab data openly accessible to the public, in contrast to the traditional academic publishing system that only publishes the final results of research and often only positive results. More than that, driven by the open ethos of science, a growing number of scientists and researchers use blog, slide sharing, preprints, and social media to communicate research and engage the public. Just as Quirós (2009:63) argues, open and interactive initiatives are reinventing academic publishing into 'a dialogue between scientists [and the public] without mediation or obstacles'. All these are making science more transparent and inclusive than ever. Open research scholarship provides opportunities for educational reuse and repurposing as well.

Traditional forms of textbooks are only secondary knowledge rewritten by educators, as a result of which learners access restricted and possibly biased representation of knowledge. Open publications have widened public access to the original representation of knowledge by its creators (as publications) as well as the process of creating and developing knowledge. Technically the process of the social and academic construction of scientific knowledge is accessible to learners who can thus understand how knowledge is originated, developed, revisited, and debated. This is fundamental difference brought about by the OIP inspired new 'textbooks'.

The constructive first step would be harnessing open research publications to reform textbooks. Compared with textbook content, research publications critically represent the latest knowledge developments and written by researchers themselves, which also include a critical review of existing literature and insightful recommendations on future research directions. This will inspire new scientific pedagogies not only in tertiary education, but also possibly at lower levels of STEM education. A

further next step is to harness the dynamics of open science. Mediated by OIP, almost every stage of the research life-circle ranging from proposal, research design, data collection, data analysis, draft, preprints, peer review, and post-publication debates is publicly accessible. This has greatly enriched the knowledge resources that could be reused and remixed for educational purposes, moving far beyond traditional textbooks.

A growing number of individual educators have begun to embed open scholarship and open data in STEM teaching, which would otherwise be costly to obtain through commercial sources or doing experiments by themselves. There are also institutional initiatives as well. For example, *Connected Curriculum*, developed by University College London, is “an institution-wide initiative which aims to ensure that all UCL students are able to learn through participating in research and enquiry at all levels of their programme of study”⁶. It further calls for closing “the divide between teaching and research” through integrating “research into every stage of an undergraduate degree, moving from research-led to research-based teaching”⁷. School of Data is another example, focusing on empowering people “with the skills they need to use data effectively”⁸, which is defining a new literacy in the open data age.

Open Content Resources in Arts, Social Sciences, and Humanities

We are living in a culture and media environment of abundance instead of scarcity (Ren, 2014). This is fundamentally changing our views and ways of using content and knowledge, not only for entertainment and everyday life, but also for teaching and learning. Weller (2010) categorises OERs into “big OERs” created by institutional projects with explicit educational purposes and “little OERs” created by individuals “from a variety of motivations, but can have an educational intention ascribed to them by someone else”. Weller (2010) further points out that, the Web 2.0 enabled little OER “represents a more dynamic model that encourages participation, and may be more sustainable. For learners, a mixture of both [big and little OERs] may also create a varied, engaging experience.”

With the rise of user-generated-content (UGC) and born digital publications, like in STEM areas, there is much more materials educators and learners can use than just open ‘educational’ resources (or big OERs) in social sciences and humanities as well. The born digital content and UGC have direct benefits for courses like foreign languages where learners can easily access real language environments through social media. Another direct implication is self-published literary content for the courses like publishing, editing, and creative writing, which provides much more diverse sources of literature with different styles and levels, also at different working stages. This is sharply contrast to the traditional publishing system the mainstream educators depend on, which only publishes the final edited versions of editor-selected literature.

Like science, the development of journalistic and creative content is being more transparent and inclusive than ever. Innovative educators are aware of the educational value of born digital content and user-generated-content, i.e. little OERs, and the dynamics of an increasingly open landscape for media, arts, and humanities. The OpenLIVES project at University of Leeds aims to “digitise and publish materials documenting the experiences of Spanish migrants to the UK and returning migrants to Spain, repurposing this data as open educational resources”⁹. It also involves students in the creation and evaluation of these OERs; students in a final-year course were asked to conduct own research using open data and assessed innovatively. It is reported that students valued original research and creative control over their education (Martínez-Arboleda 2013). This example demonstrate the value of open data for learning and teaching in humanities and social science disciplines. Similarly, Beijing Normal University has led a project of online training system for editors

⁶ http://www.ucl.ac.uk/teaching-learning/strategic_priorities/connected-curriculum

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http://www.researchresearch.com/index.php?option=com_news&template=rr_2col&view=article&articleId=1343435

⁸ <http://schoolofdata.org/>

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http://www.webarchive.org.uk/wayback/archive/20140614060648/http://www.jisc.ac.uk/whatwedo/programmes/digitisation/content2011_2013/openlives.aspx

based on real journalism content¹⁰. The project aims to provide a system whereby users can train and test their sensitivity to valuable news sources and learn editorial selection criteria based on a large-scale database of news reports and readers' preferences. As such, students are working as editors and gatekeepers in the virtual system, doing multiple choice questions and selecting what they believe the readers are most likely to read. The students' choice will then be compared with the real world data. This content-rich system is imitating the future working of journalism students by including real-world data so that students can apply the theories into editorial practices. Though there are long way to go to translate open resources into innovations of pedagogies, these initiatives have shown inspiring and convincing examples.

Interactive Publishing and Open Learning Space

An EU open publishing initiative uses the term "liquid publications" (Cuel, Ponte, & Rossi, 2009) to define the new approach to publishing scientific knowledge: (a) content is updatable and knowledge is continuously evolving; and (b) knowledge is built in a constructivist way based on collective intelligence and social collaboration. In OIP, Internet users are empowered to actively co-create, share, edit, remix, and assess digital content, either individually or collectively. This makes OIP potentially a digital/open learning space, enabling interest-driven, social, and interactive learning. Literat (2012) frames the different levels of artistic participation (receptive, executory, and structural) in online crowdsourced art platforms and suggests that participants can play very different roles ranging from passive audiences of finished artistic product, engaged participant in redesigned projects, to co-designers and co-authors. This framework applies to a wide variety of OIP areas where learners can participate in knowledge developments at different levels and as different roles. Significant opportunities exist in using the OIP platforms as an interactive online learning space, which exist beyond the institutional Learning Management Systems. There are mainly four aspects of innovative learning designs:

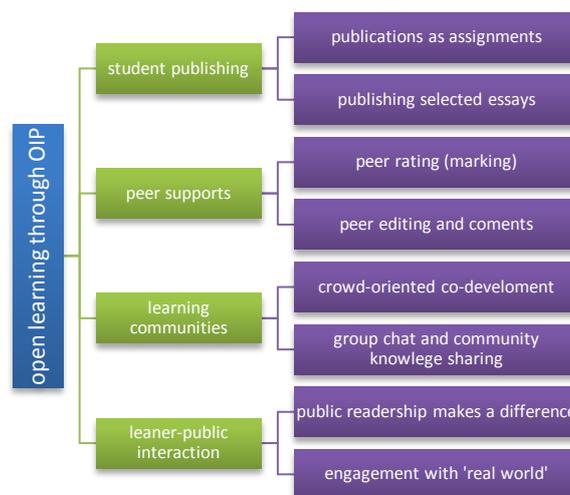


Figure 1: Major aspects and learning activities in the digital learning space enabled by OIP

Student Publishing

It is increasingly popular that educators take the advantages of self-publishing to publish the educational content they create. How about students? A large number of courses have writing assignments but students' works are normally read only by examiners. This lags behind the development of Internet and open publishing. It is now viable and reasonable for students' writing to have wider readership and educators should encourage it. The leading scientific journal *Nature* once published a research paper written by a group of pupils based on an experiment they conducted, which implies potentially significant value of student-made innovations. Students' works like assignments, are part of overall knowledge commons of human beings, which should be accessible to everyone in the digital age. More importantly, publishing students' works is beneficial for learning itself. Just as Jim Moulton argues, 'Publishing was important. It gave me the opportunity to take the

¹⁰ <http://nsts001.com/index.php>

moral high ground and ask the [learners] to do their very best because their writing was headed for publication. We all know that real audiences make a difference'.¹¹

Practically there are two major ways to use student publishing to improve learning. One is publications as assignments, in which teachers or educators give clear instruction that students need to publish their assignments online. Educators might give learners more freedom in choosing topics and encourage them to find the topics they are most passionate about. Sometimes educators might even adopt social assessments provided by OIP as part of the overall marking. This will stimulate learners to set a higher level of goals when doing assignments and they will learn how to write for engaging readers rather than pleasing markers. Another way is to publish selected essays and assignments written by students after formal assessments. Educators can encourage students to adapt their assignments into publications if needed.

OIP is an enabling technology for such innovations in higher education. There are a wide variety of self-publishing platforms like Lulu and Amazon's create space whereby students can publish their essays, creative fictions, and other feature articles generated from learning. Student publishing as an open learning activity is not a privilege of subjects like creative writing; there are also opportunities and OIP platforms for students in STEM and other disciplines to publish their works. Undergraduates and postgraduates can publish their original research with various student-run academic journals like *Student Pulse* which is "an open-access academic journal that highlights the work of students at the undergraduate level and above." The open access publishing platforms including both online journals and online preprints also welcome high quality submission from university students and some even set a special section for student essays because they regard students' work as valuable emerging voice in the academia.

Peer support

OIP encourages and depends on peer editing to improve the quality of content. For learners, peer editing provides a good opportunity to learn how to write and improve their writing skills. In addition to the direct contribution to content improvement, learners could also benefit from comments and feedback provided by peers. In contrast to peer support within formal online learning environments, learners in open learning space benefit from a wide range of expertise beyond textbooks and classrooms, perhaps including experts and senior level peers in their fields. The feedback and comments might be more insightful and helpful. It is believed that "online writing communities offer students who are gifted a chance to explore and create a supportive peer group." (Olthouse & Miller, 2012). Such benefits and dynamics apply to other subjects as long as learners are able to find their peers in the OIP platforms. For example, physics students might enjoy high level peer supports if they publish their work with initiatives like arXiv; chemical students might benefit from engagement with their disciplinary blog-sphere ChemBark.

Learning Communities

A defining feature of OIP is crowd-oriented knowledge development and mass collaboration, illustrated by platforms like Wikipedia. Focusing on educational values and uses, there are many possibilities for OIP to be used as a learning space in this regard. A large number of Wikipedia contributors are students in Higher Education institutions and their creative work in crowdsourcing knowledge is valuable learning experience as well, which should even be recognized by formal assessments and credentialing in some ways. Another important example of mass knowledge development is citizen science, in which students could make substantial contributions associated with their learning process and in a collaborative environment. It is believe that science today is not only for the public, but also from the public. As the participation of wiki-models within institutional eLearning systems is comparatively low, open platforms outside educational institutions might provide better social learning experience, encouraging students to contribute to the mass collaboration of knowledge advancements in broad real world associated with own interests and passion.

The value of OIP communities also lies in the consumption of content. Social reference management tools like Mendeley and Zotero are equally valuable for collaborative learning (Estelles, Del Moral, & González, 2010). By looking at other peers' libraries and the references they stored, learners can

¹¹ <http://www.edutopia.org/self-publishing-student-writing>

efficiently access the key literature and references in a discipline or a course and their own contribution matters to others as well. The folksonomy built by learners' collaborative selections might provide different synthesis of knowledge than textbooks and the process of selecting references collaboratively benefits learners in various aspects as well.

A step forward in educational innovations is needed in order to harness the affordances of OIP platforms as a supportive and collaborative learning community. It is not just about learning knowledge, it is more about cultivating collaborative skills. The P2PU (peer to peer university) provides a good example of the power of open community in transforming learning and even disrupt the traditional teacher-student paradigm.

Learner-public interaction

It is believed that science today should be built upon citizen inquiries (Williams, 2010). Likewise, arts and humanities "are now connected to contemporary ideas about citizenship, caring and public engagement." (Delacruz, 2009). Education should go beyond the academic ivory tower and shifting the priorities from delivering abstract knowledge (fact) to encouraging civic participation. OIP provides valuable enabling technologies and platforms. Through activities like self-publishing and collaborative knowledge developments, students and learners could have their voices heard widely as knowledge creators, commenters, and collaborators in the public sphere of science, literature, arts, and so forth; they can create knowledge, publish content, and interact with the public and the real world. This is not only novel learning experience, but also, an essential part of educating capable citizens in the 21st century.

Discussion

While OIP is instrumental to education it represents open culture and values as well. OIP is built upon the belief that knowledge is commons and knowledge production is collective, participative and inclusive. Educational innovations is driven and inspired by the open transformation of publication from one-way information flow like traditional textbooks to networked flow based on collaborative models. This echoes the shift of learning theories and paradigms towards connectivism (Siemens, 2005). All these suggests great potential of the educational uses of OIP for reforming learning design and pedagogies.

As discussed above, the primary impact of OIP upon education lies in the potential of moving beyond 'textbook-fact' model in teaching and learning. Given half of scientific knowledge is proved to be incorrect within 45 years (Arbesman, 2012), it questions the pedagogies based on transferring "fact" to students. By widening learners' access to research publications, open scholarship, and knowledge production and communication, the adoption of OIP is a constructive first step to reform the traditional paradigms. This provides significant opportunities for further educational innovations through combining the OIP 'tools' with various paradigms, cultures, and values.

OIP-inspired pedagogies focus more on literacies. There is a steady growth in the emphasis on teaching about the nature of science in STEM education. It is argued that, students need to be taught about the methods of scientific investigation and the role and status of scientific knowledge in the societies at large (Wong & Hodson, 2009). OIP enables learners to participate in real scientific communication and even the whole research life circle by either accessing open scholarship or interacting with research teams. This is valuable in nurturing literacy. Similarly new literacies could be cultivated through participating in creative works or knowledge production in social sciences and humanities. Digital literacy is another essential literacy for students today. As a substantial part of open Internet, there is no doubt that OIP helps with cultivating students' digital literacy, not only the skills of seeking, reusing, and remixing content, but also the literacy as a connected creative citizen, expressing themselves and engaging audiences creatively.

The uses of open content and interactive publishing space in education will foster students' critical and creative thinking. Rather than just transferring and discussing authoritarian 'fact' in textbooks, OIP as a learning space with evolving knowledge and democratic environments provides learners with opportunities to participate in knowledge development as well as directly question and challenge the

authorities. This helps to increase learners' "21st century skills", in particular, thinking critically, analytically, and creatively (Silva, 2009; Tytler, 2007).

OIP enables inquiry-based, interest-driven, and personalised learning outside the walled garden of digital learning based on institutional Learning Management Systems. Learning in open publishing activities is not a process designed by educators and instructors in advance, but an ongoing learner-driven and self-directed process based on learners' own interests and passion as well as inquiries of knowledge. Moreover, OIP broadens the scale and scope of knowledge access by learners and thus increase the possibilities of more diverse and personalised learning. It will be especially beneficial for the talent students to expand their vision and learning beyond the restriction of textbooks and classrooms. Personalisation comes from both the abundant diverse content provided by open publications and the networked and collaborative dynamics of interactive publishing models. On the other hand, learning is increasingly social and collaborative. Open environment enables collaboration with strangers and much more diverse Internet users globally, which is not available in closed institutional eLearning system.

Undeniably the use of OIP is challenging traditional learning and teaching. As some educators argue in the context of creative writing education, 'The changes created an ideological struggle as new writing practices were adapted from broader societal fields to meet the instructional and regulative discourses of a conventional writing curriculum' (Mills & Exley, 2014). This applies to broader educational contexts. Generally, it is less challenging to embed OERs into traditional pedagogies and curriculums than broadening the scope of OERs and further facilitating students-led creation and collaboration in OIP platforms. Like any emerging practices, there are obvious technical difficulties to be sort out. For example, the reliability of OIP platforms in terms of the access to content, the archiving and security of usage data, and so forth; the interoperability between OIP platforms outside campus and the institutional Learning Management Systems. Other concerns exist in students' privacy, ethical issues in student research and other academic activities. New methods for assessment and credentialing are also urgently needed as their current absence creates obvious barriers against to OIP adoption.

More than that, the barriers from educators' mindset, institutional policies, and educational culture are crucial. The perception of educational values and transformational potential of OIP remains limited and biased. Educational innovations associated with OIP require tremendous input of time, creativity, expertise, and workload, which is, however, luxurious resources in current institutional contexts of higher education. The educators generally lack initiative and passion of leading pedagogical innovations. Further, every academic is fighting against busy schedule and competing demands on time and resources. Last but not least, the overall educational culture is built upon formal (traditional) credentialing and accreditation which is structurally incompatible with the informal learning inspired and enabled by OIP as well as open Internet.

Despite of the challenges, there are still opportunities for moving forward practically in reforming learning designs and pedagogies through adopting OIP. OIP as initiatives outside the traditional education domain has developed very rapidly, with thousands of mature and large-scale platforms. A growing number of educators within tertiary education system have already taken advantages of various OIP models and resources in educational practices. Deriving from the above discussion on both the dynamics and challenges, the following recommendations are proposed for effectively exploring the value of OIP as a catalyst for educational innovations.

- **Taming "wild" OERs:** Through widening learners' access to the process of scientific research, OIP is of value in developing new pedagogies that focus on students' critical thinking and scientific literacy. The term 'free range' is sometimes used to describe the openly licenced OERs that could be freely remixed and reused. Defining OERs beyond being "educational", open publications and content resources provided by OIP are even more 'free range'. Rather than 'little OERs', open and interactive publications are 'wild' OERs. Once 'tamed' by careful indexing, purposeful learning design, instrumental instruction, open publications could be valuable alternatives to the traditional textbooks and OERs.
- **Moving beyond institutional LMS:** Educational technologists believe that the Web 2.0 inspired platforms could be facilitators and enablers of social and interactive learning and have invested heavily in building such social connections within closed institutional LMS

systems. These initiatives are valuable and functional as they are closely related to educators, learners, and formal learning resources. However, learners' participation social activities hosted by formal LMS is usually low and during short term only. OIP provides a large amount of digital, open, and informal learning space outside the institutional online learning systems. Using these third party public platforms not only saves money for educational institutions, but also might lead to more interactive and engaging learning, enabling students to interact with the real world.

- **Redefining “open” textbooks:** Open textbooks should not be just openly licenced traditional textbooks. Instead, the deluge of open information and resources are driving reinvention of 'textbook'. It is not appropriate any more to 'feed' learners with 'manufactured' learning materials given abundant open and original materials in the OIP systems. Of course there is much to do in tailoring open publications for education, including indexing, filtering, assessing, remixing, and repurposing content. But redefining open textbooks beyond packaging OERs into traditional formats is a realistic and constructive first step in linking OIP with educational innovations.
- **Open learning design:** There is considerable potential to reform pedagogies through open learning design, integrating learning activities with OIP and possibly outside institutional LMS and the controlled traditional domain of education. In the highly self-directed and self-organized knowledge open environment, the roles of educators, institutional supervision, assessment, and credentialing need to be redefined. The challenge lies in the formalisation of OIP-inspired or –enabled learning activities and embedding them into curriculums. It also demands new methods for assessment and credentialing in order to evaluate and recognize open learning activities, for which open badges, micro-credentials and learning analytics might be practically helpful. Open learning design might be easier in the subjects that directly benefit from open publications and OIP, for example, practice-led courses like design and visual arts, lab-based courses like biology, medical sciences. In these subjects, open resources provide valuable references, examples, lab data, which would otherwise cost a fortune to produce by educators.
- **Collaborating with OIP platforms:** Educational technologists and learning designers might need to improve the awareness and capability of collaborating with OIP platforms. Many OIP platforms are built upon open culture and have APIs for educational developers; they also welcome collaboration that could expand their uses for learners and learning purposes. The collaboration, particularly in technological aspects, is necessary to provide a user-friendly, reliable, and efficient interface for educators to conduct innovations in teaching and pedagogies.
- **Using OIP as a bridge to the real world:** It is important for students to learn how to survive in the real world with their knowledge and skills and thus urgent for our education going outside the 'campus' (either physical or mindful). OIP is an enabling technology for cultivating 'free range' students in an open knowledge environment. Moving beyond textbooks and closed institutional learning environment will also improve students' employability in future, which is increasingly a priority in Higher Education policy today.

Conclusion

The fast growth and evolution of digital publishing is somewhat neglected by educational technologists, at least not being considered as a systematic dynamic. It is thus necessary to systematically examine and discuss OIP as a catalyst for open education innovations and differentiate it from other similar or relevant dynamics. It is worth mentioning that OIP itself is no longer an experimental beta, but a mature paradigm with a large number of established platforms and billions of active users. In other words, OIP provides more ready-to-use platforms than other emerging ideas or

eLearning initiatives. In order to explore the potential for education, learning designs need to integrate OIP with pedagogies and course developments innovatively and develop practical instruction and guidelines for educators and learners to engage with various emerging publishing practices. It is equally important for institutional policies changes in assessments and credentialing to recognize open learning activities and creative achievements associated with OIP. Thus, this paper is calling for a deep understanding of the transformative potential and evolutionary value of OIP beyond simple applications like electronic or open textbooks. It calls for initiatives based on the OIP platforms and practices to function as a catalyst for educational innovations.

In his book 'The Battle for Open', Martin Weller (2014) points out that though open has achieved triumphs in education, there is still much to do. As discussed above, the full educational value OIP can yield is being restricted due to a narrow lens of 'open' focusing on free access to content and the reduction of textbook cost. The limited understanding and adoption results from a paradox about OERs: open educational resources are developed and used in a closed institutional system of education. The dynamics and constraints of OIP are just a snapshot of the broad tension between open Internet and closed educational institutions. This highlights the significance and necessity of shifting priorities from open educational resources to open educational innovations and the transformation of pedagogies, mindsets, and policies accordingly.

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