Open Education: A Revolution of Resources and Community

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Abstract:

Open educational resources and supportive communities offer the perfect environment for open education. The revolution to open education from traditional classroom resources and teaching methods advances our understanding of the educational process and helps us progress to higher levels of thinking. Through an exploratory network analysis, this synthesis of existing literature examines educator and student needs while recognizing the required curriculum aspect of the course. Highlighting available resources and communities for open education with respect to communication between educators and students, delivery of curriculum to students, and instructional design that integrates open resources drives the main concepts of this review. The objective of the review entails discovering resources and communities that support open education and connect students to the curriculum through educators.

Introduction

Openness cultivates an exceptionally successful culture and environment that strives on altruistic values. Volunteers dedicate hours of time and their lives to a dream of improving humanity through their talents. Crowdsourcing of these talents fostered great advancements in software, hardware, content and education. The movement gained momentum through the rise of web 2.0 tools, social media, and the semantic web that connected masses with common goals and objectives. People with similar aptitudes and talents started to build upon each other's research and contributions. More so, the Internet offers a means of hosting open software, content, and courses in communal environments, accessible to everyone. This synthesis of literature offers new open resources, instructional design concepts, and delivery views for faculty.

History

The open movement started with the software environment in 1983 as Richard Stallman in a rebellious fashion announced his GNU project, a free operating system opposing UNIX (Stallman, 1998). Stallman believed in free software that allowed access to the code so everyone could alter the code to meet their needs. He despised the concept of closed proprietary software where users relied on a corporation for bug fixes and version upgrades. He thought proprietary software held the users captive, forcing them to purchase upgrades and new licenses especially if users changed operating system platforms (Williams, 2002). To assist with the project, Linus Torvalds (1992) contributed a kernel to the GNU project's libraries and compilers to complete

the popular Linux operating system. Today, Linux developers boast over 400 different variations of operating system that meet specific user needs (Torvalds, 1999). Additionally, Linux operates over a fifth of the world's servers and shows exponential growth due to storage needs of Big Data (IDC, 2011).

The free software revolution started the openness ideal, but the Netscape declaration proved the legitimacy of the movement. In 1998, Netscape announced that the source code for the popular Communicator web browser would be open to the public under the Mozilla Firefox project. During the announcement, Netscape coined the phrase "open source software" (Aksulu & Wade, 2010). Firefox browses the Internet more than any other browser in the world and offers more add-ons to simplify the browsing experience (W3schools, 2013). The success of the Mozilla and Linux projects solidified the importance of openness in software.

During the same time of Netscape's announcement, David Wiley publicized the first open content license based upon the free and open source software development (Wiley, 2003). The popularity of the license grew very quickly and many open source software projects released their documentation under this license. Advancing the license, the Creative Commons released a new series of licenses that assisted content creators in publishing their content for reuse and improvement (Creative_Commons, 2007). Open content resources like Wikipedia (http://www.wikipedia.org/), Project Gutenberg (http://www.gutenberg.org/), Curriki (http://www.curriki.org/), and CK-12 Flexbooks (http://www.ck12.org/) sprung up across the web providing open content to anyone with an Internet connection.

Noticing the content explosion on the Internet, the Massachusetts Institute of Technology (MIT) launched 50 free pilot courses on OpenCourseWare (Caswell, Henson, Jensen, & Wiley, 2008). In 2001, MIT's president announced that the institute would release all of its courses free to the public to view on the web (MIT, 2001). Other higher education institutions such as John Hopkins, Notre Dame, and Stanford joined the ranks of opening their courses to spark the open education advancement.

Emergence of Open Content

Open source software, open content, and open courses create open educational resources (OER) to fuel the open education ideal. OER provides access to high quality, accurate material and content. Communities like OpenCourseWare Consortium (http://www.ocwconsortium.org/) and K12 Open Ed (http://www.k12opened.com/) along with all of the social media provide a gathering environment that fosters content creation and collaboration among educators. These communities allow faculty members to share their research, findings, and course structures with others in their field (Caswell et al., 2008). Baraniuk (2007) praises these communities as he remarks that the open education movement will alter the way authors, educators, and students interact. Open education revolutionizes course notes, curricula, and textbooks (Hylén, 2006).

The availability of OERs including text, images, audio, video, interactive simulations, problems and answers, and games alters instructional design and delivery (Schweik, Evans, & Grove, 2005). New instructional designs like the flipped classroom (Tucker, 2012), massive open online courses (MOOC) (Martin, 2012), project oriented design based learning (Chandrasekaran,

Stojcevski, Littlefair, & Joordens, 2013), gamification (Muntean, 2011), and multiplayer classrooms (Sheldon, 2011) gain popularity and show promise of connecting better with students. New delivery methods such as blended (Osguthorpe & Graham, 2003), hybrid (Leppa, Brockhaus, Goldstein, Bliquez, & Porter, 2011), online (Allen & Seaman, 2011), mobile (Shadle, Perkins, Lincoln, Humphrey, & Landrum, 2013), and virtual worlds (Wilks & Jacka, 2013) hold students' attention and give them access to learning anytime and anywhere.

Brown and Adler (2008) state that the most profound impact of the Internet is its ability to support open social learning. They continue to explain the challenges of current college students in respect to the ever changing workplace and finding a career. College students will most likely move from career to career and must learn new skill sets to remain working. Not only must students gain a foundational knowledge base, but they must self teach themselves new skills (Zhao, Lu, & Wang, 2013). Therefore, educators are more important than ever. Educators must stay current with trends and instructional designs to assist students with their current challenges. One of the largest challenges for educators pertains to awareness of the resources and communities available to them. This research investigates open educational resources and offers solutions.

Synthesis of Literature

The synthesis of literature performs an exploratory network analysis of current resources and communities available for open education to bring awareness to educators about their options. The exploratory network analysis highlights high quality open educational resources that offer benefits to the educational community. The analysis investigates the educator, student, and curriculum domains of the open education environment along with the overlapping of subdomains. These subdomains include design and resources, delivery, and communication as illustrated in figure 1.
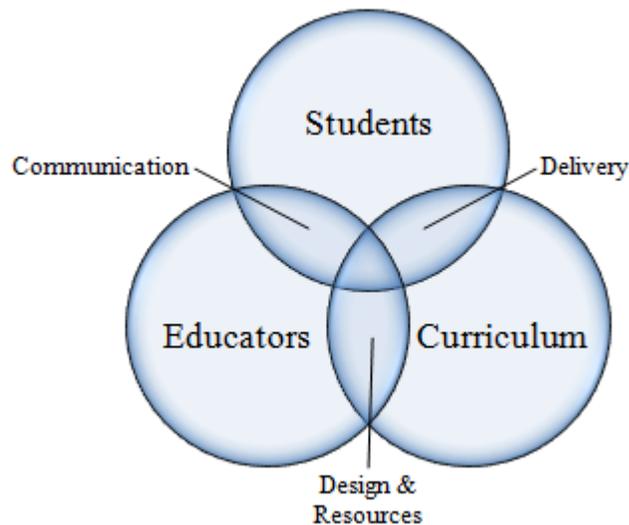

Figure 1. Open education domains and subdomains.

The synthesis provides the first step in the development of an educator's personal learning network geared towards open education. The educator's personal learning network offers opportunities for knowledge and resource growth which ultimately provides students with

exposure to new and innovative instructional design and resources (Dabbagh & Kitsantas, 2012). The synthesis examines resources and emphasizes the positive attributes of the OER.

Within the three subdomains of open education lies a plethora of resources to assist educators with adoption of this model. Communication, delivery, and design and resources structure the important aspects of the model. Figure 2 showcases a few of the important subgroups within each of the subdomains. Communication among educators and students can occur through mobile devices, video conferencing, threaded discussions, and email. Delivery of curriculum and content to students happens through learning management systems, cloud hosting, and virtual worlds. Educators design curriculum through a variety of methods from resources that they gather from communities and hosted sites.

Figure 2. Open education subdomain resources.

Communication evolves continuously from each generation of learners. Current trends highlight mobile devices (smart phones, tablets, netbooks, and laptops) as the favorable means of communication. Students benefit from the anytime, anywhere, and anything access that mobile devices afford them. Through mobile devices, students can text and email with ease and with quick response times. Video conferencing whether Skype (http://www.skype.com/), ooVoo (http://www.oovoo.com/), Google Hangout (http://www.google.com/hangouts/), or Big Blue Button (http://bigbluebutton.org/) prove to be a valuable communication method with students. Thread discussions typically occur in a learning management system and offer a means of following and providing feedback to a written discussion.

The delivery method for the course's content acts as the home base for students. This home base informs students about upcoming assignment due dates, link to content, and function as a document repository. Most often the delivery method stems from a learning management system. Moodle (https://moodle.org/), Canvas (http://www.instructure.com/), and Edmodo (https://www.edmodo.com/) fill the educator's requirements when it comes to delivering content. The cloud provides another means of delivering content through a series of free storage options

such as Skydrive (http://www.skydrive.com/), Google Drive (https://drive.google.com/), and Dropbox (https://www.dropbox.com/). A final possible delivery solution involves virtual worlds. Second Life (http://secondlife.com/) leads the way in virtual worlds, but many OpenSim (http://opensimulator.org/) virtual worlds open every day on private servers.

Instructional designs continue to evolve and offer a variety of solutions on structuring content delivery. A few popular designs include flipped classroom, massive open online courses (MOOC), project oriented design based learning, and multiplayer classrooms. The flipped classroom provides video and e-text content to students while they are not attending class which allows them to ask the educator more questions during class while they solve problems related to the viewed content (Tucker, 2012). MOOCs give students the opportunity to take free courses on a variety of subject matter with unlimited participation (de Waard et al., 2011). Coursera (https://www.coursera.org/) and FutureLearn (https://www.futurelearn.com/) hosts MOOCs from universities across the world with professor lead instruction. Other universities like MIT, Harvard, Yale, Carnegie Mellon, and Stanford offer MOOCs without an instructor. Another design involves a gamification of content, where the students learn the content through serious gaming (Muntean, 2011). A final design called the multiplayer classroom consists of developing the entire course into a game. The students advance through gaining access to higher levels and having options to obtain higher scores through various assignments (Sheldon, 2011).
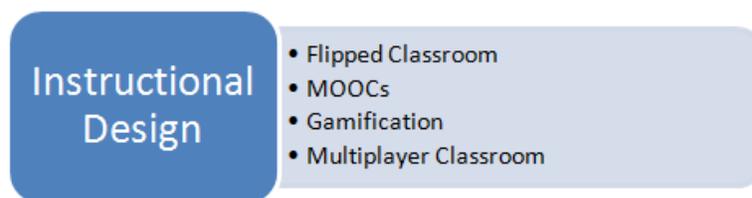

Figure 3. Instructional design.

Open educational resources have exponentially grown over the past 5 years thanks to web 2.0 tools and the semantic web. Fortunately, open communities host collected resources to assist educators in finding the content they desire. In respect to software, the open source software communities host hundreds of thousands of software solutions. Sourceforge (http://sourceforge.net/) hosts over 400,000 active software projects and their search engine gives educators easy access to the free software. Github (https://github.com/explore) has the largest collection of free and open source software in the world. AlternativeTo (http://alternativeto.net/) and Osalt (http://www.osalt.com/) list alternative free open source software solutions to common purchased proprietary software. Open e-text and content communities include the Project Gutenberg (http://www.gutenberg.org/), Curriki (http://www.curriki.org/), and CK-12 Flexbooks (http://www.ck12.org/). The most impressive of the open content communities is the Internet Archive (https://archive.org/) that boasts over 5.6 million texts, over 1.5 million videos, and over 1.8 million audio recordings. Many more OERs can be found through social media as well. For instance, following Pinterest boards, LinkedIn groups, and Twitter hash tags will lead to more valuable OERs.
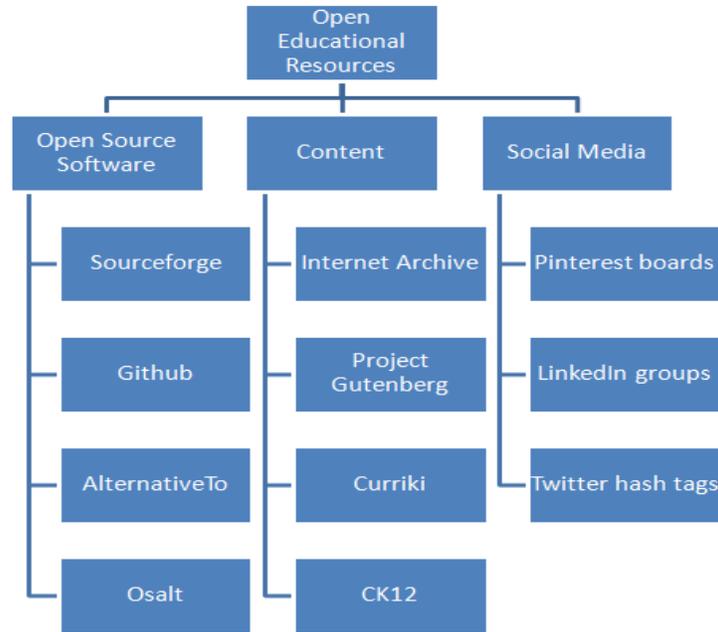
Figure 4. Open educational resources.

Conclusion

The paradigm shift from traditional education to open education affords many new opportunities to educators and students. The domains of open education along with the subdomains present an opportunity of true connection as seen in figure 5. When all elements align, educators teach fluidly and students acquire the desire to learn. Educators and students develop personal learning networks to support their learning interests. These personal learning networks afford new growth in open education, making it unique. The special trait about open education entails its dynamic structure to accept change. Change within the world is consistent and students must learn to adapt to new settings. Open education allows students to learn content, but also allows them to learn how to teach themselves at the same time. This preparation allows students to learn new skill sets when they accept new career paths. Open education presents educators and students with more educational resources, larger support communities, and a better, more natural learning environment.
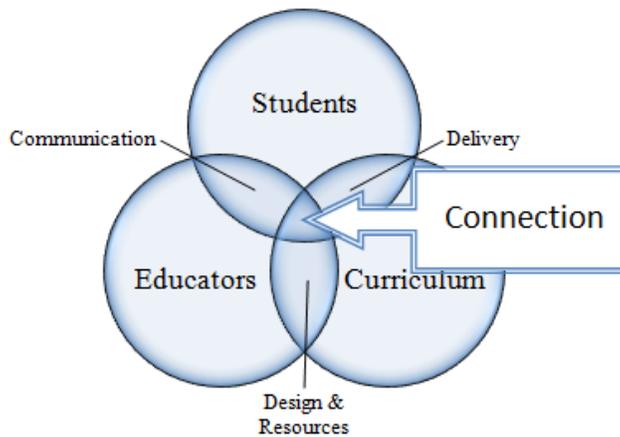

Figure 5. Connection of open education.

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