

This is a rough draft for an upcoming article. Please do not use this version. Citation information for this article:

Baker III, F.W. (2016) An Alternative Approach: Openness in Education over the last 100 Years.
TechTrends doi: 10.1007/s11528-016-0095-7.

An Alternative Approach: Openness in Education over the last 100 Years.

Abstract: What is the nature of openness, and what role has it played in education over the years? The concept of openness has traditionally been very difficult to define, and its history in education has often been ignored, obscured, or misrepresented in the literature, media, and popular culture. This paper provides an operational definition of openness and highlights the history of openness in education over the last century. This serves as a useful lens for better understanding the nature of openness and from which to examine the role of openness in education in new ways. This history legitimizes openness as an approach to education with historical significance, and establishes a precedent for certain types of instructional strategies and educational models that are common today. The paper concludes with a push for educators to continue thoughtfully integrating openness within the current educational system in a practical, experimental way. This will continue the integration of these systems and result in one that retains the strengths of both traditional and open approaches.

Introduction

Openness is a concept that has long been intertwined with education, yet has proven difficult to define, and is often used in ideological or political ways. This paper establishes an operational definition of openness, highlights the history of openness in education, especially through some of the major influences in the last century, and concludes with a discussion and possibilities for future research. The purpose of this paper is to establish a lens which makes the concept of openness more accessible in practical terms, and to attempt to legitimize openness as a historically valid approach to education which promotes certain theories and practices. The goal is to provide tools that promote new types of discussions about openness and promote different ways of thinking about the role of openness in education. This is in hopes that these new

discussions and explorations will ultimately support a reflective experimentation with, and continued integration of, openness into the current model of education, while simultaneously decreasing the occurrence of reflexive and adversarial positioning of openness that so often occurs by many who are interested in its practice.

Defining Openness

Historically, the term “openness” resists formal definition. The concepts underpinning the term can be very fluid in meaning and often only make sense when situated within a given context. Further, its use can become very ideological and political. The term open invokes in many an instant recognition of certain concepts and vague notions of certain values, but becomes slippery and even dangerous when attempts are made to establish a common definition or to narrow the term’s field of use. Efforts to define openness have often, although not exclusively, taken one or some combination of three general approaches. These include grounding openness in historical accounts of related movements and events; philosophically or conceptually seating openness as the underpinning ideal of a given context; and operationally negotiating openness in practical contexts.

Three Approaches to Defining Openness

The purpose of the first approach, grounding openness in historical accounts of related movements and events, is often to associate or transfer the morals, characteristics, and ideals from the described movement into the current context. This is often done to provide a model for understanding openness. For example, Couros (2004, 2006) and Wiley (2006) describe openness as an emerging academic culture stemming from the Open Source Software movement. Peters and Britez (2008) discuss the social

and political nature of openness by exploring the ideals of freedom and justice, tying the current movement to the enlightenment. Peter and Deimann (2013) extend the consideration of openness to include the mobile population of the late Middle Ages where education was escaping the traditional borders of the monastery. Giaconia and Hedges (1982), Broudy and Palmer (1965), and Stephens (1974) even note how debates between the methods of an inquisitive self-directed model of Open Education and the more formal top-down methods of traditional education have been ongoing since the time of Socrates.

The second approach, promoting openness as the underpinning framework for given contexts, is often used to ascribe features of openness to the context. Examples include the idea of openness underpinning participatory cultures by providing stakeholders with rights to access and change a work (The Digital Connections Council of the Committee for Economic Development 2006, 2009); Wiley's (2010) claim that all education is by default open to some degree because education itself is about sharing; and Peters' and Roberts' (2012) exploration of openness as a virtuous force for the moral good that underpins digital advancements in open scientific communication, open education, open knowledge production, open publishing, and other related areas.

While the first two approaches deal with the transfer of characteristics to or from openness, the third approach seeks to negotiate openness within a given context. One common mechanism for this approach is the consideration and use of alternative copyright licenses, such as the GNU (not an acronym) General Public License (GNU GPL) (Free Software Foundation, n.d.-a) or the various Creative Commons Licenses (Creative Commons, n.d.-a). These licenses allow content creators to dictate

inseparable permissions for the use of their works (Organisation for Economic Co-Operation and Development, 2007) and to make their works more or less open depending upon the type of content license they choose (Baker III, 2012).

Defining openness through its practical consideration in contexts focuses primarily on the affordances that implementing openness provides. For tangible resources, the availability and accessibility of the resource are the primary determinants its openness (The Digital Connections Council of the Committee for Economic Development, 2006). A resource can be a video, lesson plan, lecture, book, or other licensed creative work. Wiley (2010) extends this concept of a resource's openness to include specific affordances provided by alternative copyright licenses. These affordances are known as the "4 R's" of reusing, revising, remixing, and redistributing a resource (Incidentally, these match closely to the four freedoms for software defined by the Free Software Foundation {Stallman, 1998}, described later). A fully open resource is one that is licensed under the least restrictive alternative copyright licenses (Wiley, 2012). Users of fully open resources have the right to use the resource for their own purposes (reuse), to update or change it to fit their context (revise), to combine it with other resources (remix), and to distribute the original work or their updated versions (redistribute) to whomever they wish (Wiley, 2012a). Wiley (2014) has since added a 5th "R," retain, to his framework to signal ownership and control of copies of the work. The Centre for Educational Research and Innovation (2007) reiterates that a resource's free digital availability and minimal "technical, legal, or price barriers" (p.32) restricting its use are the most important considerations of its openness.

Meiszner (2011) broadens the practical consideration of content to include openness

as access and use to educational communities as well by defining openness as the free and Open Access to the usage of and the right to modify and re-use digital open educational resources and digital educational tools, and the free and Open Access to the related virtual educational communities, in order to learn, teach, exchange or advance knowledge in a collaborative and interactive way. (p.6)

Tunnell (1975) defined openness by proposing four rules common to the practice of open education in a learning environment. First, the freedom rule implies that learners should have agency over their educational experience. Second, the environment rule proposes that open education environments should be resource rich and full of opportunity for exploration and learning. Third, the individual instruction rule encourages instructors in open learning environments to personalize instruction wherever possible while guiding learners toward educationally worthwhile goals. Fourth, the respect rule insists that all instructors provide respect to the learner as a human being with rights and feelings (Baker III & Surry, 2013a; Tunnell).

Proposing an Operational Definition

Commonalities between all of these efforts to define openness emphasize a variety of constructs. These include the role of freedom, justice, respect, openness as attitude or culture, the absence of barriers, promotion of sharing, accessibility, transparency, collaboration, agency, self-direction, personalization, and ubiquitous ownership. In this paper, I propose an operational definition of openness as referring to the possession of transparency and freedom (Baker III, 2014b). Something that is transparent is “easily seen through, recognized, understood, or detected; manifest, evident, obvious, clear”

(“Transparent,” 1914, definition 2b). Something that, or someone who, possesses freedom is in “the state of being able to act without hindrance or restraint; liberty of action” (“Freedom,” 2008, definition 4a). These characteristics may be present in an idea, attitude, community, procedure, resource, implemented design, or other system or product.

It is also important to include in the definition consideration of openness as a continuous, rather than binary (ie., on/off), construct. This idea, put forward by the Digital Connections Council of the Committee for Economic Development (2006, 2009), views openness on a sliding scale, meaning the system, concept, or object in question can range from fully open to not at all open, and may rest anywhere between these extremes. Therefore, a fully open system is transparent enough that anyone inside or outside of the system can see and access all parts of it. This is because transparency relates to the visibility and accessibility of all parts of the system, process, idea, or other application. Similarly, anyone inside or outside of a fully open system could operate and interact with each element of the system without barrier. In other words, they have the freedom to operate as they wish—they own the system. Instilling freedom can take on a variety of forms. Some examples include lightening or removing limitations to access such as logons and data tracking features, making directed use (flow, interaction order, linearity, etc.) of the system less rigid and controlled (e.g., giving access to all parts of a course at once), and changing rules that inhibit flexible use of content and processes such as restrictive copyrights, and regulations.

Sufficient presence of freedom and transparency enables learner behaviors associated with openness including sharing, collaboration, obtaining agency over the

experience or ownership of the ideas and content, feasible self-direction, and the growth of the attitude or culture of openness (Baker III, 2014a). An idea that is highly transparent and largely free can be shared with others, discussed in groups, modified for various purposes, incorporated into organizations, and so on. Some examples are listed in Table 1.

Table 1.

Possible implementation examples of Transparency and Freedom

Openness Components	
<u>Transparency Component Examples</u>	<u>Freedom Component Examples</u>
Learners have access to read the textbook and materials	Learners have permission to share, modify, edit, and create derivative works from the textbook and materials (e.g., Wiley's 5 R's)
Learners can see the entire course schedule, read ahead, and plan for later parts of the course	Learners can select which portions of the course to complete in the order they choose, submit items when it best suits them, and choose which items to complete
Learners know where the course material is sourced from, and have access to external sources of information	Learners are encouraged to consult and participate with others who are outside of the traditional borders of the classroom, and to bring those external participants into the learning community of the course as full participants
Learners understand clearly which criteria they will be graded on, and what types of performances/assignments are expected of them	Learners have agency in choosing what they are evaluated on, and have a voice in creating assignments that satisfy the criteria of the course
The course is taught in common language that makes all terms and concepts accessible	The course and materials are licensed in a way that allows them to be freely translated into other languages that may be more accessible for others.

There are limitations to this definition. For example, by this definition, a fully open

idea is one that is fully and publicly visible to, and usable by, anyone. Therefore, the idea must be described in language anyone can easily understand and must be available and accessible to anyone (i.e., fully transparent), and licensed or made available in such a way that anyone has full use of the idea for any purpose in any manner they desire without limitation (i.e., fully free). Obviously, the fully open and fully closed ends of the continuum are very probably impossible standards. How can one communicate an idea well enough that absolutely anyone can easily see and understand it? How can we limit an idea so much that no one knows of it? Still, retaining these extremes is useful in conceptualizing how open something is by placing it along the continuum.

Contextualizing The Definition

In assessing the openness of something, it may be helpful to consider its place in the matrix diagram seen in Figure 1. This matrix considers the dual continua of transparency and freedom so that four quadrants emerge. The item under consideration may fall into the fully free and fully transparent quadrant, Quadrant I, the fully free and not transparent quadrant, Quadrant II, the not free and fully transparent quadrant, Quadrant III, or the not free and not transparent quadrant, Quadrant IV. As these are continua, an idea, product, innovation, etc. can also be closer to the center or further to the outside of the matrix depending upon how much transparency and freedom it entails. Items fit into each quadrant based on a subjective interpretation of how transparent it is and how much freedom is embodied within it.

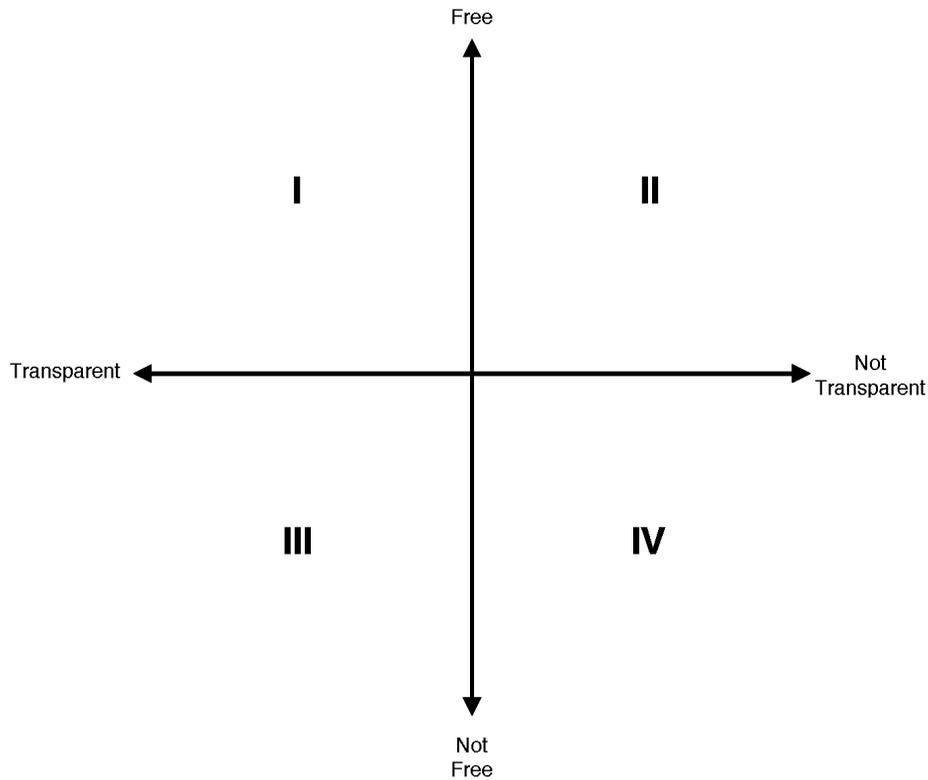


Figure 1. Matrix of Openness.

Example items that may fit well into Quadrant I include works licensed as Creative Commons Zero (CCO) for public domain or under an Attribution only license (CC-BY), the open and participative Digital Storytelling 106 course (DS106, DS106.us) at The University of Mary Washington, or Open Access research. Examples for Quadrant II may include things such as rare skills or languages. Quadrant III may include things such as works licensed under a Creative Commons Attribution-NonCommercial-NoDerivs (i.e., no derivative works) license (CC-BY-NC-ND), some of the institutional MOOC platforms, and perhaps items such as filed patents. Items that may fit well in Quadrant IV include traditional copyright practices, traditional research publishing models, the secret formula for Coca-Cola, and many funding decisions. This model serves its function as an object to think with and through, but what fits neatly into which

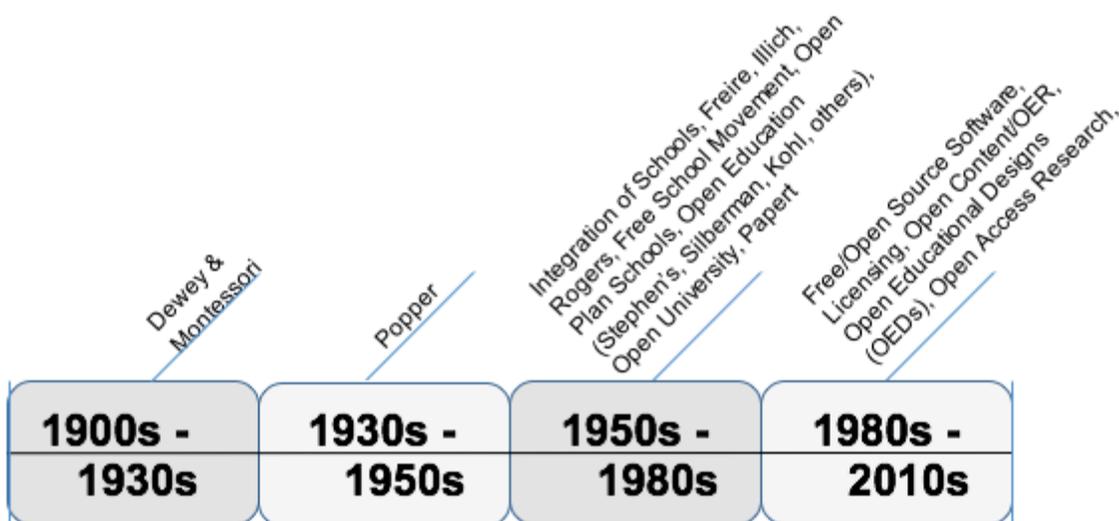
category is certainly contextual, debatable, and likely to shift given different circumstances. Placement in one quadrant or another is intended to help one think about the item in question, and not to impart judgement on the item in question.

A Brief History of Openness in Education

As noted above, the roots of openness can be seen in education as far back as the inquisitive efforts of Socrates (Giaconia and Hedges, 1982; Broudy and Palmer, 1965; Stephens, 1974), and have been noted in several other movements, including monastic border transformation (Peter and Deimann, 2013), its link to the enlightenment (Peters and Britez, 2008), and similarities and transformations that occurred in the Open Source Software movement (Couros, 2004, 2006; Wiley, 2006). Stephens (1974) outlines an excellent history of open education as well. An overview of the timeline to follow can be seen in Figure 2.

Figure 2

A Timeline of Openness in Education Since 1900



Openness from 1900s to 1950s

Transparency and freedom have been critical concepts guiding many educational design decisions, especially throughout the last century. In the reform efforts of the early 1900s, they were influential in Dewey's experience-driven model of education, which encouraged learners to become reflective and inquisitive agents in their own learning processes for the ultimate sake of becoming a functional citizen (Dewey, 1938, 2001), and in Montessori's (1912) discovery education model emphasizing self-paced exploration of environments and organic collaboration. They were also critical concepts in the conceptualization of Popper's Open Society in the 1930s and 1940s, which emphasized the individual's role in respectful and serious consideration of opposing ideas, the process of evaluating truth, embracing transparency and freedom in processes, equal treatment of everyone, and practicing tolerance toward nearly everything save intolerance (Popper, 1966). For Popper, freedom referred to both positive freedom (i.e., freedom to grow and act) and negative freedom (i.e., freedom from interference and coercion), both essential for the development of citizens in a democratic society (Lam, 2013). Karl Popper is also cited as the father of open thinking, and his ideals for an open society are a major influence of the Open Source Software movement (Tkacz, 2012).

Openness from the 1950s to 1980s

In the 1950s, 60s and 70s, transparency and freedom drove much of the thinking around the proper form and role of education in society and in the racial integration of the American Public School System. At this point, the open society was conceived of as a place where all manner of "cultures, value systems, and lifestyles not only coexist but are nurtured" (p.3) and one that "lets people come from wherever they are" (p.1)

allowing equal opportunity for what the citizens want from a community (Association for Supervision and Curriculum Development 1974 Yearbook Committee, 1974).

Conversely, the existing state of the school system was thought of as an oppressive structure that perpetuated racism, classism, and elitism, and ensured the continuation of the existing societal norms.

Freire (1986) explored the nature of education as an oppressive structure and emphasized the necessarily mutual efforts of the oppressors and the oppressed to escape the process. He emphasized the importance of obtaining a critical consciousness, or *conscientizacao*, in the dialectical process of gaining freedom, which holds that people are perpetually incomplete, and seek to constantly explore and understand, test ideas, be open to revision, and generally take a critical stance toward information (Freire, 1986). These concepts are very similar to the requirements of citizens in Popper's Open Society (Roberts, 2011).

In a critical statement on the nature of the current system of schooling, (Illich, 1971) challenged society to critically question the existing school concept, disestablish the system, and replace it with self-directed learning webs. Given that digital technology has made the learning webs concept more feasible, it is not surprising that some recent educational models that attempt to reframe or extend educational boundaries, including networked participatory learning, personal learning environments, and connectivist learning models, have developed commonalities with the concept.

According to Illich (1971), the three purposes of a good educational system should be to:

Provide all who want to learn with access to available resources at any

time in their lives; empower all who want to share what they know to find those who want to learn it from them; and, finally, furnish all who want to present an issue to the public with the opportunity to make their challenge known. (p. 75)

Rogers (1969) provided a phenomenological and facilitative approach to teaching that emphasized the goal of education as facilitation of learning and adaptability to change, reinforcing the idea that an educated person is one who continually seeks to learn (Milhollan & Forsiha, 1972). This type of thinking helped usher in the age of free education, where the demand to have respect for and trust in the learners drove open education. Open education practices during this time were built on the belief that learners learn through interacting with others and with their environment. It was believed that learners' interests should dictate their interaction with their own education (Hays, 1991). Educators paid special attention to stimulating involvement in learning, optimizing teachers' interpersonal qualities, and utilizing the ideal type and amount of direction of the learning process. Concerns in the teaching process included structuring learning experiences, utilizing materials, and establishing dialogue between the teacher and student (Silberman, Allender, & Yanoff, 1972).

During the 1960s and 70s, the traditional classroom was often conceptualized as an oppressive, rule bound, authoritarian teacher-centered and teacher-directed structure that demanded obedience, stifled creativity, and crushed the student's voice. This view was often contrasted with the vision of the open classroom model as emphasizing a holistic approach featuring "trust in the student, freedom of movement and speech in the classroom," and promotion of "enthusiasm for and independence in thinking and

learning” (Hays, 1991, p. 6). Kohl (1969) describes how “the authoritarian environment of the school ... encouraged a collusive atmosphere in which everyone except the students pretended that the school was functioning smoothly and effectively and that teachers were ‘doing a good job’” (p.12). He went on to describe the authentic, community-like classroom that he was able to develop by learning to listen, becoming involved with creating things in the classroom, and working together with the students in an open classroom (Kohl, 1969). Stephens (1974) outlines a number of specific practices for establishing and teaching in an open classroom, and (Silberman et al., 1972) provides detail about the theory behind the inquiry approach to teaching in open classrooms.

During this time, the establishment of open distance learning began allowing access to education for learners who were previously unable to attend. The Open University (OU) in the United Kingdom pioneered this effort by opening its distance learning system in 1971 without entry requirements. At the time, only about 5% of the UK population had access to higher education (McAndrew, 2010). A cost analysis done shortly after opening the OU showed that the cost for providing most of its distance classes were substantially lower than the traditional alternatives, which bolstered the case for growth of the OU distance model (Laidlaw & Layard, 1974).

Experiments with the design of the physical learning environments also commanded much attention during this time. Open plan school designs often featured communal open spaces free of most walls, obstructions, and physical barriers. High ceilings, innovative designs, and freely accessible communal areas were common. These physical design features had predictable and measurable impacts on the behavior of

learners in the environments (Evans & Lovell, 1979; Weinstein, 1977), and showed that the open classroom was a viable alternative, although not measurably superior to, the traditional classroom (Horwitz, 1979). It is important to note here that opening the floor plan of a school does not make it “open,” but helps create an environment that enables open pedagogical methods and learner behaviors.

In the mid-to-late 1970s, the open education movement fell out of favor largely due to theorists overpromising results, confusion over what the approach entailed, and conflicting research results (Hays, 1991). However, emerging computer technology gave rise to alternative conceptualizations of what learning could be. For example, Papert (1980) helped create the LOGO programming language and encouraged its use in conjunction with robots, called Turtles, as “objects-to-think-with” (p. 11) that would allow children to freely explore ideas and learn the fundamental rules and processes of geometry and math experientially from a constructionist perspective.

Openness from the 1980s to 2010s

The concept of free software, developed in the 1980s, has had a tremendous impact on openness as well. The Free Software Foundation (FSF) was founded in 1985 with the purpose of designing computing that is accessible, usable, and beneficial to all human beings (DiBona, Ockman, & Stone, 1998). The free software concept is less about the cost of the software than it is about the freedom that comes with it. When applied to software, this means a user is “free to run a program for any purpose” (i.e., reuse), free to “modify the program” (i.e., revise), free to “redistribute copies” (i.e., redistribute), and free to “distribute modified versions of the program so that the community can benefit from” the improvements (i.e., remix) (Stallman, 1998, p. 32). This emphasis on freedom necessitated the development of a license that would preserve

the freedom of software even after it left the hands of the creator, which led to the creation of the GNU General Public License (GPL) Copy Left license that flips copyright by using its protections with the purpose of preserving freedom rather than with restricting use of the work (Stallman, 1998). The FSF-promoted idea that specific technologies, such as the Internet, should themselves be considered human rights is a concept still being debated today (Wicker & Santoso, 2013).

The 1990s was a time for intense advancement in open computing and Open Content. Around 1992, the free software movement helped develop the world's first free operating system: Linux (Stallman, 1998). This decade also saw the first Open Content licenses that extended the free software concepts to content of other types (Caswell, Henson, Jensen, & Wiley, 2008). Toward the end of the decade, the FSF had developed some rigid political views about software and human rights (DiBona, Ockman, & Stone, 1998). Its focus on developing products that were both free as in gratis, or cost, and free as in liberty, or freedom, led to often poor relations with businesses seeking to utilize the software. This encouraged the development of the open source concept. Open Source Software (OSS) still shared the source code and provided freedoms and rights to users, but with a focus on creating less restrictive user and more business friendly products (Stallman, 1998). It is important to highlight this period as marking a significant shift in the conceptualization of openness. It was during this time that the idea of 'free as in gratis' (i.e., free of cost to the user) became integrated with the definition of openness. Before this time, freedom in openness focused primarily on positive freedom (i.e., freedom to act and grow) and negative freedom (i.e., freedom from interference and coercion).

The 2000s have been dubbed the open decade (Materu, 2004). During the 2000s, maturing alternative copyright licenses were extended to include options for texts, videos, and other creative works, the first major open educational resources (OERs) were released, the open course was created, and Open Access (OA) research started coming into focus. In 2001, the Free Software Foundation created the GNU Free Documentation License (FDL) (Free Software Foundation, n.d.-b) that applied to texts and other content (Caswell et al., 2008), and the Creative Commons alternative copyright licenses were developed and released to the public in 2002 (Creative Commons, n.d.-b). That year the Massachusetts Institute of Technology (MIT) also created a large set of OERs by releasing their course content under the Open CourseWare (OCW) system. In 2004, MIT OCW adopted the Creative Commons Licenses for OCW (Massachusetts Institute of Technology, n.d.). The first open courses were created and released in 2007 (Rodriguez, 2012; see “The Wiley Wiki,” n.d.), and the Harvard Law School faculty adopted an Open Access policy for its research in 2008 (Harvard Law School, 2013).

The 2010s have seen the expansion of these movements and their tighter integration in education. There were over 400 million Creative Commons Licenses estimated to be in use at the end of 2010 (Creative Commons, 2013). MIT OCW now has over 2100 courses published (Massachusetts Institute of Technology, n.d.). The amount and types of open courses available have grown into divergent paths that operate under different types of openness and have entirely different design structures. An umbrella term for these open courses are Open Educational Designs (OEDs) (Baker III & Surry, 2013). Additionally, Open Access research is the subject of debates and

legislation (Khan, 2012; Knutson, 2013). The advance of digital technologies is an important element driving and enabling this expansion.

Digital technology enables the broad application of transparency and freedoms to various systems (Lessig, 2004, 2008). In many cases, an extensive application of openness was impossible or infeasible before technology enabled it. Sometimes applying the concepts of openness challenges the traditional methods a system operates under, and other times can force an institution to deal publicly with novel challenges (Lessig). These situations can result from decisions made by faculty or administrators, or from governmental or societal pressures, among other causes.

In higher education, the implementation of openness has brought about novel public challenges in a number of areas. Example areas include OA research (Khan, 2012; Knutson, 2013), OSS (Abel, 2006; Digital Connections Council, 2006), Open Content (Bliss, Robinson, Hilton, & Wiley, 2013; Matkin, 2009; David A Wiley, Hilton III, Ellington, & Hall, 2012), Open Teaching and Learning practices (Baker III & Surry, 2013; Henn, 2012; Liyanagunawardena, Adams, & Williams, 2013; Rodriguez, 2012), and other less focused areas such as open data (Minister of State for the Cabinet Office and Paymaster General, 2012) and crowdfunding (Anderson, 2011; Wheat, Wang, Byrnes, & Ranganathan, 2013).

Digital technology has enabled the inexpensive, efficient, and widespread communication and distribution of research. OA research emerged as a concern when the ability to broadly and inexpensively distribute information was combined with pressures for transparency, access, and lower barriers throughout the research system (Laakso, Welling, Bukvova, & Nyman, 2011). These pressures were especially

prevalent around the demand for access to publicly funded research (Lewis, 2012). The same digital distribution that supports the case for OA research also enables honest consideration of openly licensed digital content such as OER and open textbooks as practical alternatives for some course materials. OSS provides often-reliable alternatives to, and sometimes supplements for, standard restricted access and profit driven models of software development and use (Abel, 2006; DiBona, Ockman, & Stone, 1998). Open Teaching and Learning uses openness and digital technology, including the shift toward online learning, to challenge the definitions and assumptions of effective learning on the web. An example of this are the connected learning efforts starting to take place in higher education (Ito et al., 2013). Proponents for Other Areas of Openness take advantage of this digital openness to experiment with and challenge their own traditional structures (see Baker III & Surry, 2013a; Rodriguez, 2012; Siemens, 2005). It is important to note that technology enables the broadened implementation of openness, but does not provide specific affordances that are unavailable without the technology. Technology is simply a tool, and the principles of openness can be implemented in systems without digital technology.

Discussion

As seen from this timeline (i.e., sequence) of events, openness (i.e., transparency and freedom in systems) has been integral to the conceptualization of, and thinking about, education in the last century, even though many of the resulting models fall into the “alternative approach.”

One reason openness has not been more prominent is due to the nature of the term

and the difficulty in arriving at a functional definition. Open is a term that immediately lends itself to certain ideals, but has proven difficult to pin down into a simple definition or set of principles. This is in part due to the slippery nature of the term, and in part the result of efforts to politicize it and create an ideological, almost religious, fervor around the term and associated concepts evangelizers wish it to elicit. The term has even been used to portend the ruin of the dominant education system (e.g., Leckart, 2012). Positioning openness in these ways often negates the hard work, well-intentioned efforts, and legitimate progress of the dominant education regime, and places open educational approaches as adversarial to the current system rather than as a complementary or alternative approach. Presenting openness as oppositional makes it inherently political and establishes openness as an underdog with little chance of winning broad support.

A better approach might be to attempt integrating openness with the current educational model, as is starting to become more prevalent in small pockets of education, and letting the benefits (and drawbacks) speak for themselves as they are discovered and negotiated. If openness can't be integrated wholly, perhaps establishing or operating within a sub-system alongside the dominant system (such as some MOOC efforts) would provide a sufficient sandbox for experimentation. The traditional approach to integrating openness in education has been more akin to selling openness as some type of miracle salve that promises to negate the need for any other solution on the market, and then writing off any failures or underwhelming results as a misapplication of the product. In my view, a more cautious, experimental, evidence-driven approach toward integrating openness should be taken. Thankfully, this experimentation

searching for the benefits of integrating openness is starting to occur in various places throughout education (e.g., Bliss et al., 2013; Dalton, 2015; Georgia Institute of Technology, n.d.; Harvard Law School, 2013; Hilton, Robinson, Wiley, & Ackerman, 2014; Hyman, 2010; Wiley et al., 2012).

Another reason these approaches are not more prominent may be related to their relationship to the concept of control. Open approaches require instilling transparency and freedom in the system, each of which requires a release of some control to the users. Whether for administrative ease, scalability, experimental measurement, or other reasons, many hold the perception that education is a system that can be tightly controlled and therefore attempt to treat it as such. While some influence can certainly be had over specific elements of education, it is, in essence, a wicked problem (Ackerman, 2015). Wicked problems are those issues with multiple valid and mutually contradicting solutions that can each be legitimately supported (Ackerman). Ackerman (2015) differentiates between the science approach to education, where the goal is to seek tame (causal) solutions through attempting to create causal interactions and measure them precisely (i.e., the control approach), and the art approach to education, where each case (e.g., student, learning environment, school, etc.) is considered unique and effectiveness can only be implied cautiously and within a specific context (and therefore, solutions cannot be copied and scaled up without correcting for specific situational factors). He concludes that education is itself a non-neutral, ill-structured, technology where solutions must be negotiated locally using a variety of approaches (Ackerman). In my view, open approaches to education have been a recognition of these facts, and many of the various approaches to open education have been

experimental attempts to negotiate artful, local, contextualized solutions to persisting problems. In reality, there is a need for an educational system that caters to both ends of the spectrum—a system that can be measured and scaled reliably, and still provides the freedom and expression required of a humane system. Administrators and governing bodies have long sought a causal system that can be predicted, controlled, and scaled, but these require the ability to plan accurately, measure specifically, and precisely identify the causal outcomes of specific inputs; all things that, according to the research on wicked problems, are at best extraordinarily difficult, and most likely impossible within these systems. Open approaches have often been reactive responses to this type of control thinking. By reflectively and critically integrating the two approaches, a more holistic approach would result that integrates the best elements of both approaches and negotiates any difficulties locally and within context.

Understanding openness as instilling transparency and freedom into content and systems is a simple, feasible, scalable perspective that can be easily integrated into current (especially digital) education efforts at all levels of the system. Instructors can choose to use open content or connect their students with the larger communities through use of the Internet and social media. Administrators can advocate for open access research repositories and make their decision models and various processes visible and usable to the world. Institutions can openly license portions of their work, offer free courses to the world, and partner with non-traditional organizations for mutual advantage. None of these things are right or wrong, and being a little bit open in some cases is better than being totally open. Each of these situations needs to be negotiated locally and within context, and the decision needs to be supported and sustainable. This

will also help educators be more intentional about the shift toward openness, and reduce some of the negative impact seen in reactive short-lived efforts toward openness that are unfortunately so common.

Future Research

There are a plethora of opportunities for future research in this area. These include efforts to expand or further explore the timeline outlined in this article, examine practical opportunities to implement openness in the current educational system based on the simple operational definition of openness supplied in this article, and to explore the impact of openness on education either historically or in the current period in light of the definition in this paper.

Ideas to expand the timeline include adding events, theories, philosophies, and schools of thought during each decade; expanding the details for events in the current decade to establish a common system for tracking events related to openness into the future; or examining the events presented in this timeline (and other related ideas and events) for common content and themes, likely using a content analysis approach. Ideas to implement openness using the current definition include doing a content analysis on current implementation efforts to see where transparency and freedom play out in these efforts, or finding and sharing ways to implement transparency and freedom into resources, course design, assignments, and content. Ideas for exploring the impact of openness on education include performing content analyses on policy documents (e.g., Baker III, 2014), interviewing faculty, staff, and/or administration in education institutions, or searching for infrastructure related to supporting openness in a given

education sector. Another idea for future research would be to search the literature on openness to reinforce, modify, or edit the operational definition of openness proposed in this paper.

Conclusion

Openness has been a common thread in education for as long as education has existed, yet for most of this time it has been on the fringes of educational thinking. At the same time, viewing openness as instilling transparency and freedom in a system places openness as a critical element to education that is strongly associated with some of its most core goals—creating citizens who can operate functionally in a democracy, establishing in students an authentic ability to think critically and problem solve, and making education relevant and responsive to the needs and goals of the society. Openness is a powerful force in education, but the open approach doesn't readily lend itself to methods that are easily measurable or scalable. The term "open" is also easily hijacked and used for political or ideological purposes, and now has an unfortunate history of being an instrument for over-hyping and underperforming. Historical approaches to implementing openness in education have often taken an all or nothing approach that has been detrimental to the cause. The conceptualization of openness has also seen a tremendous shift with the incorporation of the 'free as in gratis' concept in the 1990s. The ramifications of this shift are still unfolding in a variety of ways today.

The concepts of transparency and freedom are critical for education, and implementing these in practical, measured ways, and negotiating the benefits and drawbacks locally and in-context is critical for establishing a strong presence of these principles in the educational systems of the future. If openness continues to be

integrated in a practical manner within the current education system, the long-term result will be a stronger, more flexible system that is less rigid and takes a more holistic view of the learner.

References

- Abel, R. J. (2006). *Best practices in open source in higher education study: The state of open source software*. Lake Mary, FL: The Alliance for Higher Education Competitiveness, Inc. Retrieved from http://www.methodist.edu/csc/ossresearch/applications_vendors/OSS_Report.pdf
- Ackerman, G. L. (2015). *Technology-Rich Teaching: Classrooms in the 21st Century*. Lanham, Maryland: University Press of America, Inc.
- Anderson, M. (2011). Crowdsourcing higher education: A design proposal for distributed learning. *MERLOT Journal of Online Learning and Teaching*, 7(4), 1–17. Retrieved from http://jolt.merlot.org/vol7no4/anderson_1211.htm
- Association for Supervision and Curriculum Development 1974 Yearbook Committee. (1974). *Education for an Open Society*. (D. Della-Dora & J. E. House, Eds.). Washington: Association for Supervision and Curriculum Development.
- Baker III, F. W. (2012). Unshackling future minds: How including openness in teacher education can avoid insurrection and usher in a new era of collaboration. In P. Resta (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 1488–1493). Chesapeake, VA: AACE. Retrieved from <http://www.editlib.org/p/39793>.
- Baker III, F. W. (2014a). Open Participatory Engagement Network (OPEN): An Instructional Design Meta-Framework for Creating Participatory Networked Learning Environments. In *Society of Instructional Technology and Teacher Education Conference 2014*. Chesapeake, VA: AACE.
- Baker III, F. W. (2014b). *Policies related to the implementation of openness at research intensive universities in the United States: A descriptive content analysis [Doctoral Dissertation]*. Retrieved from <http://pqdtopen.proquest.com/doc/1638267596.html?FMT=ABS>
- Baker III, F. W., & Surry, D. W. (2013). Open Education Designs: A taxonomy for differentiating and classifying open learning environments. In R. McBride & M. Searson (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2013* (pp. 189–194). Chesapeake, VA: AACE. Retrieved from <http://www.editlib.org/pv/48090>.
- Bliss, T. J., Robinson, T. J., Hilton, J., & Wiley, D. A. (2013). An OER COUP : College teacher and student perceptions of open educational resources. *Journal of Interactive Media in Education (JIME)*, (February), 1–25. Retrieved from <http://jime.open.ac.uk/2013/04>
- Broudy, H. S., & Palmer, J. R. (1965). *Exemplars of teaching method*. Chicago: Rand McNally.
- Caswell, T., Henson, S., Jensen, M., & Wiley, D. A. (2008). Open educational

- resources: Enabling universal education. *International Review of Research in Open and Distance Learning*, 9(1). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/469/1001>
- Couros, A. (2004). *The open source movement: Implications for education comprehensive essays. Unpublished Manuscript*. Retrieved from http://www.educationaltechnology.ca/couros/publication_files/unpublishedpapers/Couros-OpenSource-Comprehensives-June30-04.pdf.
- Couros, A. (2006). *Examining the open movement: possibilities and implications for education (Doctoral Dissertation)*. University of Regina. Retrieved from http://www.educationaltechnology.ca/couros/publication_files/research/Dissertation-Couros-FINAL-06-WebVersion.pdf.
- Creative Commons. (n.d.-a). About the licenses. Retrieved from <http://creativecommons.org/licenses/>
- Creative Commons. (n.d.-b). History. Retrieved from <http://creativecommons.org/about/history>
- Creative Commons. (2013). Metrics.
- Dalton, M. (2015). Ga. Tech's MOOC Master's Degree Program Off To Solid Start | WABE 90.1 FM. Retrieved January 14, 2016, from <http://news.wabe.org/post/ga-techs-mooc-masters-degree-program-solid-start>
- Dewey, J. (1938). *Experience and education*. New York, New York, USA: Touchstone.
- Dewey, J. (2001). *Democracy and education* (Electronic). Hazelton: The Pennsylvania State University. Retrieved from <http://www2.hn.psu.edu/faculty/jmanis/johndewey/dem&ed.pdf>
- Digital Connections Council. (2006). *Open standards, open source, and open innovation: harnessing the benefits of openness. Innovations: Technology, Governance, Globalization*. United States of America: Committee for Economic Development. Retrieved from <http://www.oss-institute.org/storage/documents/Resources/studies/open-standards-open-source-harnessing-benefits-of-openness.pdf>
- Digital Connections Council of the Committee for Economic Development. (2006). *Open standards, open source, and open innovation: Harnessing the benefits of openness. Innovations: Technology, Governance, Globalization*. United States of America: Committee for Economic Development. Retrieved from <http://www.oss-institute.org/storage/documents/Resources/studies/open-standards-open-source-harnessing-benefits-of-openness.pdf>
- Digital Connections Council of the Committee for Economic Development. (2009). *Harnessing Openness to Improve Research, Teaching and Learning in Higher Education. Innovations: Technology, Governance, Globalization*. Washington, DC: Committee for Economic Development. Retrieved from <http://www.ced.org/pdf/Harnessing-Openness-to-Improve-Research-Teaching-and-Learning-in-Higher-Education.pdf>
- Evans, G. W., & Lovell, B. (1979). Design modification in an open-plan school. *Journal of Educational Psychology*, 71(1), 41–49. <http://doi.org/10.1037//0022-0663.71.1.41>
- Free Software Foundation. (n.d.-a). GNU General Public License.
- Free Software Foundation. (n.d.-b). Licenses. Retrieved from <http://www.gnu.org/licenses/licenses.html#FDL>

- Freedom. (2008).
- Freire, P. (1986). *Pedagogy of the oppressed*. New York: Continuum Publishing Corporation.
- Georgia Institute of Technology. (n.d.). MOOC Experiments with Teaching Strategies. Retrieved January 14, 2016, from <http://www.news.gatech.edu/2013/08/05/mooc-experiments-teaching-strategies>
- Giaconia, R. M., & Hedges, L. V. (1982). Identifying Features of Effective Open Education. *Review of Educational Research*, 52(4), 579–602. <http://doi.org/10.3102/00346543052004579>
- Harvard Law School. (2013). Open access and scholarly publishing.
- Hays, L. (1991). *Open Education: Its Development in America and Its Influence on Current Educational Themes*. Current. University of North Florida. Retrieved from <http://digitalcommons.unf.edu/etd/129/>
- Henn, S. (2012). Stanford takes online schooling to the next academic level. Retrieved from <http://www.npr.org/blogs/alltechconsidered/2012/01/23/145645472/stanford-takes-online-schooling-to-the-next-academic-level>
- Hilton, J. L. H., Robinson, T. J., Wiley, D., & Ackerman, J. D. (2014, April 1). Cost-savings achieved in two semesters through the adoption of open educational resources. *The International Review of Research in Open and Distributed Learning*. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1700/2853>
- Horwitz, R. a. (1979). Psychological effects of the “open classroom.” *Review of Educational Research*, 49(1), 71–85. <http://doi.org/10.3102/00346543049001071>
- Hyman, S. E. (2010). Open access policies. Retrieved from <https://osc.hul.harvard.edu/policies>
- Illich, I. (1971). *Deschooling society*. (R. N. Anshen, Ed.) (World Pers, Vol. 44). New York: Harper & Row.
- Ito, M., Gutierrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., ... Mahendran, D. (2013). *Connected Learning: An agenda for re*. Irvine, CA. Retrieved from <http://dmlhub.net/publications/connected-learning-agenda-for-research-and-design/>
- Khan, A. (2012, March). Thousands of researchers boycott Elsevier, demand Open Access Journals. *International Business Times*.
- Knutson, D. (2013). California open access legislation clears latest hurdle.
- Kohl, H. (1969). *The open classroom: A practical guide to a new way of teaching*. Retrieved from http://books.google.com/books?hl=en&lr=&id=cb8NAAAAQAAJ&oi=fnd&pg=PA11&dq=open+teaching&ots=VUG2fQtrRg&sig=SrRIGL36mdzrmQmpM3vm_gS6aak
- Laakso, M., Welling, P., Bukvova, H., & Nyman, L. (2011). The development of open access journal publishing from 1993 to 2009. *PLoS One*, 6(6). <http://doi.org/10.1371/journal.pone.0020961>
- Laidlaw, B., & Layard, R. (1974). Traditional versus open university teaching methods: A cost comparison. *Higher Education*, 3, 439–468.
- Lam, C.-M. (2013). A Popperian Approach to Education for Open Society. *Educational Philosophy and Theory*, 45(8), 845–859. <http://doi.org/10.1111/j.1469-5812.2011.00829.x>
- Leckart, S. (2012, March). The stanford education experiment could change higher learning forever. *Wired Magazine*. Retrieved from

- http://www.wired.com/wiredscience/2012/03/ff_aiclass/all/
- Lessig, L. (2004). *Free Culture*. New York: The Penguin Press. Retrieved from <http://www.free-culture.cc/freeculture.pdf>.
- Lessig, L. (2008). *Remix: Making art and commerce thrive in the hybrid economy*. Great Britain: Penguin Press. Retrieved from <http://www.scribd.com/doc/47089238/Remix>.
- Lewis, D. W. (2012). The Inevitability of open access. *College and Research Libraries*, 73(5), 493–506.
- Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs : A systematic study of the published literature 2008-2012. *International Review of Research in Open and Distance Learning*, 14(3). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1455/2531>
- Massachusetts Institute of Technology. (n.d.). Our history. Retrieved from <http://ocw.mit.edu/about/our-history/>
- Materu, P. N. (2004). *Open source courseware: A baseline study*. World Bank. Retrieved from http://siteresources.worldbank.org/INTAFRREGTOPTEIA/Resources/open_source_courseware.pdf
- Matkin, G. (2009). Open learning: What do open textbooks tell us about the revolution in education? *CSHE Research & Occasional Paper Series*, 1–8. Retrieved from <http://escholarship.org/uc/item/1b20t36z.pdf>
- McAndrew, P. (2010). Defining openness: updating the concept of “open” for a connected world. *Journal of Interactive Media in Education*, (JIME Special Issue on Researching Computers and Learning). Retrieved from <http://jime.open.ac.uk/jime/article/viewArticle/2010-10/html>
- Meiszner, A. (2011). *The Why and How of Open Education* (1.5 ed.). The Netherlands: United Nations University, UNU-MERIT, Collaborative Creativity Group. Retrieved from <http://www.scribd.com/doc/53332611/The-Why-and-How-of-Open-Education-v1-0-Read-also-the-new-version-1-5#fullscreen:on>
- Milhollan, F., & Forsiha, B. E. (1972). *From Skinner to Rogers: Contrasting approaches to education* (Profession). Lincoln: Professional Educators Publications, Inc.
- Minister of State for the Cabinet Office and Paymaster General. (2012). *Open data white paper: Unleashing the potential*. UK: The Stationary Office Limited. Retrieved from http://books.google.com/books?hl=en&lr=&id=SjLI8r_wFeYC&oi=fnd&pg=PA5&dq=Open+data+white+paper:+Unleashing+the+potential&ots=UJiV4rJtC2&sig=0rSSXlmiZ2ORgZPF9IBPJLVM0ZQ
- Montessori, M. (1912). *The montessori method: Scientific pedagogy as applied to child education in “the children’s houses” with additions and revisions by the author*. Frederick A. Stokes Company. Retrieved from <https://play.google.com/books/reader?id=vopsPFT9HCEC&printsec=frontcover&output=reader&authuser=0&hl=en&pg=GBS.PR3.w.1.2.0.1>
- Organisation for Economic Co-Operation and Development. (2007). *Giving knowledge for free: The emergence of open educational resources*. *oecd.org*. Paris, France: Organisation for Economic Co-Operation and Development. Retrieved from <http://www.oecd.org/edu/ceri/38654317.pdf>

- Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. New York: Basic Books, Inc.
- Peter, S., & Deimann, M. (2013). On the role of openness in education : A historical reconstruction. *Open Praxis*, 5(1), 7–14. <http://doi.org/10.5944/openpraxis.5.1.23>
- Peters, M. A., & Britez, R. G. (Eds.). (2008). *Open education and education for openness*. Rotterdam: Sense Publishers.
- Peters, M. A., & Roberts, P. (2012). *The virtues of openness: Education, science, and scholarship in the digital age*. Boulder, CO: Paradigm Publisher.
- Popper, K. R. (1966). *The open society and its enemies* (5th ed., Vol. 1 & 2). Retrieved from <http://www.inf.fu-berlin.de/lehre/WS06/pmo/eng/Popper-OpenSociety.pdf>
- Raymond, E. S., Mckusick, M. K., Bradner, S., Stallman, R., Tiemann, M., Vixie, P., ... Wall, L. (1998). *Open sources: Voices from the open source revolution*. (C. DiBona, S. Ockman, & M. Stone, Eds.). Sebastopol, CA: O'Reilly & Associates. Retrieved from <http://www.smaldone.com.ar/documentos/libros/opensources.pdf>
- Roberts, P. (2011). Openness as an educational virtue. *Geopolitics, History, and International Relations*, 3(1). Retrieved from http://ic.galegroup.com/ic/ovic/AcademicJournalsDetailsPage/AcademicJournalsDetailsWindow?failOverType=&query=&prodId=OVIC&windowstate=normal&contentModules=&mode=view&displayGroupName=Journals&limiter=&currPage=&disableHighlighting=false&displayGroups=&sortBy=&source=&search_within_results=&action=e&catId=&activityType=&scanId=&documentId=GALE%7CA267134559
- Rodriguez, O. (2012). MOOCs and the AI-Stanford like Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses. *Transition*, 1–16. Retrieved from <http://www.eurodl.org/index.php?p=current&sp=full&article=516>
- Rogers, C. R. (1969). *Freedom to learn: Studies of the person*. (C. R. Rogers & W. R. Coulson, Eds.). Columbus: Charles Merrill Publishing Company.
- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1). Retrieved from http://www.ingedewaard.net/papers/connectivism/2005_siemens_ALearningTheoryForTheDigitalAge.pdf
- Silberman, M. L., Allender, J. S., & Yanoff, J. M. (Eds.). (1972). *The psychology of open teaching and learning: An inquiry approach*. Boston: Little, Brown and Company. Retrieved from <http://library.wur.nl/WebQuery/clc/349187>
- Stallman, R. (1998). The GNU operating system and the free software movement. In C. DiBona, S. Ockman, & M. Stone (Eds.), *Open sources: Voices from the open source revolution*. Sebastopol, CA: O'Reilly & Associates.
- Stephens, L. S. (1974). *The Teacher's Guide to Open Education*.
- The Wiley Wiki. (n.d.). Retrieved from <https://sites.google.com/site/themoocguide/cck08---mooc-basics>
- Tkacz, N. (2012). From open source to open government: A critique of open politics. *Ephemera*, 12(4), 386–405.
- Transparent. (1914).
- Tunnell, D. (1975). Open Education: an expression in search of a definition. In D. Nyberg (Ed.), *The philosophy of open education* (pp. 14–23). London: The Gresham Press.
- Weinstein, C. S. (1977). Modifying student behavior in an open classroom through

- changes in the physical design. *American Educational Research Journal*, 14(3), 249–262. <http://doi.org/10.3102/00028312014003249>
- Wheat, R. E., Wang, Y., Byrnes, J. E., & Ranganathan, J. (2013). Raising money for scientific research through crowdfunding. *Trends in Ecology & Evolution*, 28(2), 71–2. <http://doi.org/10.1016/j.tree.2012.11.001>
- Wicker, S. B., & Santoso, S. M. (2013). Access to the internet is a human right. *Communications of the ACM*, 56(6), 43. <http://doi.org/10.1145/2461256.2461271>
- Wiley, D. A. (2006). Open source, openness, and higher education. *Innovate: Journal of Online Education*, 3(1). Retrieved from <http://contentdm.lib.byu.edu/cdm/ref/collection/IR/id/164>
- Wiley, D. A. (2010). Openness as catalyst for an educational reformation. *EDUCAUSE Review*, 45(4), 14–20. Retrieved from <http://net.educause.edu/ir/library/pdf/ERM1040.pdf>.
- Wiley, D. A. (2012). Defining the “open” in open content. Retrieved from <http://www.opencontent.org/definition/>
- Wiley, D. A. (2014). The access compromise and the 5th R. Retrieved from <http://opencontent.org/blog/archives/3221>
- Wiley, D. A., Hilton III, J. L., Ellington, S., & Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in middle and high school science classes. *International Review of Research in Open and Distance Learning*, 13(3). Retrieved from <http://www.doaj.org/doaj?func=fulltext&ald=1066324>