Pepperdine University

Graduate School of Education & Psychology

THE EVOLUTION AND IMPACT OF THE MASSIVE OPEN ONLINE COURSE

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Learning Technologies

by

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June, 2014

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DOCTOR OF EDUCATION

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ACKNOWLEDGEMENTS

I felt education as my dharma at a young age. While I did not understand what a calling or a purpose consisted of, the impression set forth from the teachers of my youth was lasting and scaffolded my journey here. Special thanks to teachers Mary Spain, Diana Kolman, Grimsley Graham, Peggy James and Dale Marlow; and professors Jeff Hendricks, Steve Shelburne, David Havird, George Newtown, Mark Fisch, Loren Demerath, Tom Stone, David Otto, Steve Clark and Bob Foskho.

My experience at Pepperdine University was nothing short of incredible, made so by the community of learners and scholars dedicated to a personalized learning that is authentic rather than algorithmic. The students of the Cadre Formerly Known as 16 were an excellent group to learn alongside, and I must give a special thanks to classmates Alexander Lemheney, Victoria Kim and Daryl Tate for the support to push through this project. The faculty and staff at Pepperdine have built a progressive and rigorous program in learning technologies, and I am honored to be a member of this community: thank you to Brenden Wysocki, Christie Dailio, Anthony Collatos, Farzin Madjidi, Kent Rhodes, Kay Davis, Jack McManus, Gary Stager and Paul Sparks.

Years ago I lost touch with an old college professor, Bryan Alexander, so I was surprised when out of the blue he emailed me noting that we should rekindle our relationship. For the past four years, Bryan has served as a mentor and friend who has read every word of my verbose updates and offered sage wisdom and constructive criticism in the succinct yet positive manner only Bryan can do. Having his wisdom has been an asset, but having his friendship a privilege.

My first experience in the Pepperdine program was an interview with Dr. Linda Polin, who asked me point-blank if I was crazy for starting a doctoral program at the same time I was

starting a family. For the past four years her mentorship has been there every step of the way, and I am in her debt for her effort to help me become the person I am today.

While my research interests have long been at the intersection of technology and education, it was not until I read chapters in a volume edited by George Veletsianos that I became interested in colloquially became known as the MOOC phenomenon. I had the privilege to meet George at a conference where he was the Plenary speaker, a meeting that has turned into not only a collegial working relationship but also a friendship, and I am honored that he has been willing to serve as a colleague, friend and mentor on this and other projects.

I smile upon my good fortune every morning and every night. I am blessed to share my life with my best friend, my partner, my confidant, my spark. To Rebecca: we started this journey the same week we started our journey as parents. Your strength and tenderness as we have traversed love, loss, tribulation and joy inspires my every movement. For the better part of five years you have put your personal dreams and ambitions on hold so I could be on this journey. Today, I am such a different person, and that is because of you. I am ready for our "And they lived happily ever after." And it's a sunrise, not a sunset!

And to my son, Declan, who was born the week I began my doctoral studies: you are the brightest source of light and life I have ever known. Trust in yourself, trust in your community, and let every bit of your light and love shine.

VITA

Rolin A. Moe

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Pepperdine University (2010 – 2014)
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University of Texas (2002 – 2004)
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Work with individuals and organizations in creating a shared vision for educational outreach and enacting said vision. Specialties include research, curriculum development, instructional design, and organizational leadership.

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Graduate Assistant in Education
Assist professors in research and practical efforts, most notably the design, development, collection and creation of a digital, student-centered short documentary encapsulating Pepperdine's EDLT program.

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Provide one-on-one instruction, support and tutelage to a vast array of individuals and small groups seeking assistance in K-12 learning, pursuit of a higher degree, or lifelong learning. Develop individualized programs and opportunities based on the ideas and personality of the tutee to assist them in meeting goals and objectives, with a strong focus on mastery of the subject for practical use as well as summative assessment.

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Head of Multimedia & Assistive Technology Program
Developed & implemented curriculum in multimedia appreciation & curriculum for primary and secondary students with learning disabilities. Created a program in assistive technology for students needing greater intervention, with a focus on developing autonomy.

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Provided contract work with educational start-up to design and develop hybrid courses in Language Arts. Courses were designed to meet state, national and International Baccalaureate standards.

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Designed and implemented curriculum for writing courses through a gifted and talented program for noted secondary students in the American South. Course design occurred in both face-to-face and online spaces.

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Literary Agent – Episodic Television
Identified and managed new talent, assisted existing talent in developing stories and abilities, and negotiated contracts and schedules of working talent. Duties included brainstorming projects with writers, developing new ideas, providing script coverage for prospective clients, negotiating financial contracts, and creating communities of practice between television production and clients.

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ABSTRACT

An online learning phenomenon emanated 2 ½ years ago from three courses taught at Stanford University, promising an opportunity for high-quality instruction from elite institutions and professors for no cost to the student. This phenomenon, which came to be known as the MOOC, catalyzed sweeping changes in both higher education's relationship with distance education, as well as the discussion of higher education in society, in a remarkably short period of time.

While people have questioned the effectiveness of MOOC learning and the potential negative consequences of adopting MOOC systems either in support of or to replace existing educational infrastructure, the MOOC movement has continued to grow at a rapid pace. This research study sought to define the characteristics of the MOOC on the terms of learning theory, pedagogy, history, society and policy through the use of an expert-based Delphi study, where participants engaged in a phenomenological dialogue about what constitutes a MOOC in practice, the present state of higher education in the wake of the MOOC movement, the effect the phenomenon has had on education both structurally as well as socially, and visions of the future of the institution of higher education as affected by the MOOC.

In summary, panelists focused their agreement on cognitive and pragmatic aspects of the MOOC debate, such as a hope for learning analytics to offer solutions to educational problems as well as the opportunity for the MOOC system to offer tier-based education services to consumers. The Delphi discussion showcased the importance of cognitive theory in MOOC design as well as the relationship between MOOCs and economics, and highlighted the difficulty education experts have in agreeing on how to define educational terminology.

Chapter 1: The Massive Open Online Course Phenomenon

Few phenomena in the history of higher education have generated as quick and widespread an interest as the Massive Open Online Course, or MOOC (Daniel, 2012; Downes, 2013; Waldrop, 2013). At a time when the higher education system faces questions regarding increasing enrollments, ascending costs and declining governmental support, MOOCs purport the potential of university-aligned, elite-level coursework available to a global audience at a financial cost much lower for the institution and potentially nonexistent for students (Friedman, 2013a; Vanderbilt, 2012). It is this potential that has led to rapid MOOC-based changes within the higher education landscape: the creation of inter- and intra-university organizations to facilitate courses (Watters, 2012), partnerships between these organizations and non-elite universities to offer credit-based courses at a fraction of traditional cost (Little Hoover Commission, 2013), and governmental policy proposed to both fund the development of these courses as well as identify potential avenues for MOOCs to provide college credit or alter the landscape of course accreditation altogether (California SB 520, 2013; Florida SB 904, 2013).

This notion of MOOCs as a potential savior of higher education is not a sentiment shared across the institutional landscape. Seeing modern education as embroiled in a media narrative that labels education as a broken system (Barber, Donnelly, & Rizvi, 2013; Parr, 2012), a number of researchers and faculty are skeptical of the fixes MOOCs promise to provide in terms of educational quality (Daniel, 2012) and access (Bady, 2013b; Rees, 2013a). In early literature, MOOC developers focused their message on elements of scale and access rather than pedagogy and quality (Koller, 2012). In the face of a call for scholarly research and theoretical foundation, developers have tied discussion of the model to the term pedagogy as well as a sample of research (Rivard, 2013a), and promoted the potential for the MOOC to provide ample quantities

of user data that can be mined and analyzed to determine effective learning measures (Waldrop, 2013). Despite the infancy of the learning model and lack of theoretical precedent in developing materials, faculty and institutions are under intense pressure to adopt scalable learning practices such as MOOCs (Koseff, 2014). Those who exercised caution in adopting the MOOC model have seen serious consequences, most notably University of Virginia President Teresa Sullivan, who was removed from her position in 2012 by the Board of Trustees for failing to steer the University through the MOOC phenomenon in a manner they deemed sufficient (Vaidhyanathan, 2012a). Sullivan's termination was rescinded after an outcry at her campus and beyond; however, the episode is indicative of the fervor surrounding MOOCs and their implementation.

Much of that fervor comes from the promise of MOOCs as seen from their developers and the mass media. For these individuals and their adherents, MOOCs hold the potential to transform education (Brooks, 2012; Friedman, 2012; Thrun, 2012). Viewed as disruptive technology, a technology that provides an established service to an emerging community of users and in doing so revolutionizes the existing community of users (Bowers & Christensen, 1995), MOOCs can provide elite educational experiences to any citizen of the world with access to an Internet-based computer and a willingness to perform the tasks of the course. These supporters see the MOOC as a global agent for the democratization of education, the opportunity to allow students of all races, ages and backgrounds to take classes from the best professors on Earth (Friedman, 2013b) at relatively little or no economic cost to the user. MOOCs can harness the vast array of the provider's institutional resources to help transition society from an Industrial Age, goods and services economy to a 21st Century, knowledge-based economy. From this lens, future students will not be encumbered by the mountains of debt currently plaguing college

graduates (Parr, 2013), and the MOOC model will allow an ease of lifelong learning, where individuals can enroll in MOOCs as the needs of their careers change (Hill, 2013a).

Those critical of the MOOC movement see the potential for transformation as a net negative. The start-up organizations currently organizing and hosting a majority of existing MOOCs have raised tens of millions of dollars from venture capital organizations, and these organizations expect a return on their investment (Veletsianos, 2013a). This privatization of higher education perilously mirrors domestic and international primary education privatization initiatives over the past 30 years, initiatives built around the before-mentioned *schools are broken* rhetoric, yet those initiatives of the past 30 years have produced at best a negligible improvement in student learning (Mehta, 2013). This line of thinking views the learning potential of the MOOC as secondary to the opportunity it provides private enterprise to create capital in what was heretofore a public service built on government subsidy and non-profit ideals.

Some scholars have dismissed the MOOC as a fad or compared its trajectory to prior online learning ventures that failed (Olds, 2012). While prior attempts to cultivate online learning through world-renowned institutions proved unsuccessful, MOOCs have already changed the future path of higher education, politically and culturally if not pedagogically. In a website addendum to the 2013 State of the Union Address, President Barack Obama's administration challenged Congress to debate the manner and methodology of higher education accreditation, pushing for a reconstitution in order for government to support ventures such as MOOCs:

> The President will call on Congress to consider value, affordability, and student outcomes in making determinations about which colleges and universities receive access to federal

> student aid, either by incorporating measures of value and affordability into the existing accreditation system; or by establishing a new, alternative system of accreditation that would provide pathways for higher education models and colleges to receive federal student aid based on performance and results. (United States Government, 2013, p. 5)

This federal proposal has been met by policy proposals in several states, most notably the State of California, to provide monies for the development and implementation of low-cost online courses in remedial subjects (State of California 2013-2014 Budget, 2013), the establishment of transferrable credit for up to 50 MOOC courses (CA Senate Bill 520, 2013), and the creation of a fourth higher education system in the state of California designated entirely to the aggregation of supported examinations and certifications (CA Assembly Bill 1306, 2013). The political movement is not alone in its transformative power; the MOOC is changing cultural attitudes toward the institution of higher education and its purpose, a change that could result in a cultural adoption of the MOOC as a viable alternative to or replacement of higher education (Sandeen, 2013; Thrift, 2013). According to NYU Professor and New Media researcher Clay Shirky this is not a possible future (Bustillos, 2013) but a present reality:

> …Udacity could go away next year and the damage is already done. Because there's now a group of people willing to tell themselves a story about higher education that doesn't use the same stockkeeping units as the University of Michigan. And if that becomes a wide general conversation, then we're in for a period not of reengineering, but of reinvention. (para. 18)

While reinvention discussion focuses on the institution of higher education as a system, societal structures such as higher education have historically been viewed as elements of culture and community (Habermas, 1991), and a focus on the system itself ignores the political, historical

and sociocultural repercussions of the system. Focusing entirely on education as a system that needs fixing stands in stark contrast to the notion that education is a public good designed for the betterment of community as much as the betterment of self, replacing it with an idea that education is an individual gain to be provided and proportioned as so (Labaree, 1997). Such discussion also assumes that education is in some way broken and needs fixing (Stewart, 2013). From this perspective, the MOOC represents the privatization of higher education and the removal of the institution from the public sphere and potentially the public good (Bady, 2013a).

Purpose of Research

Existing MOOC literature focuses on the structure of the MOOC in comparison to existing traditional and distance-based higher education, looking at how existing practices will translate into future outcomes and solvency. There is little research in regards to the MOOC's influence and impact on political, social and cultural attitudes toward instruction, expertise and higher education as a social structure. The purpose of this Delphi study is to understand the present impact of MOOCs on the social structure of higher education, and consider the potential future outcomes for higher education in a MOOC landscape.

Research Objectives

The research objectives for this study are as follows:

1. Find an expert-driven consensus on the impact massive open online courses have had on political, social and cultural perspectives of instruction, expertise and the institution of higher education
2. Use that consensus to envision potential futures of instruction, expertise and the institution of higher education

Conceptual Focus

Critical theory is a conceptual perspective of societies and societal structures that focuses on viewing structures and signifiers from their historical context, "as part of the existing social and political fabric that characterizes the class-driven dominant society" (McLaren, 1998, p. 185). Rather than follow an abstracted, ahistorical approach to examining the development of societal and cultural structures, critical theory challenges the dominant ideology of both contemporary and historical discourse by recognizing politics and power as integral to the development of said structures and signifiers (Deleuze, 1992).

Within the field of critical theory, a number of scholars and thinkers have established a framework unique to the issues of compulsory and higher education. This field, known as critical pedagogy, focuses its perspective on the power relationships between individuals and individual elements of the education structure: students, faculty, administration, policymakers, and so forth (Giroux, 2008). Inherent to the term pedagogy is an interest in teaching, or the methodology in which a person learns. While an historical review of higher education must incorporate individual relationships as well as an assessment of instructional strategy and pedagogy, one cannot simply substitute *critical theory* with *critical pedagogy* because education is the subject of focus (Darder, Baltodano, & Torres, 2002). Pedagogy is an element of MOOC design and history; however, the MOOC's development through and influence on society, history, education and technology make it necessary to incorporate both critical theory as well as critical pedagogy into any discussion.

Education historians have traditionally ignored the political influences shaping structural establishment and growth (Sumner, 2000; Watters, 2012). Educational technology historians, mostly working from within the field of distance education, have focused their analysis on

technological advancement and its affordance for educational use (Anderson & Dron, 2010; Bates, 1993; Nipper, 1989). Such approaches de-politicize and sterilize the numerous relationships at play in the establishment and growth of an institution such as distance education (Collins, 1991), relegating research to either tacit or overt endorsement of distance education trends (Anderson, Annand, & Wark, 2005; Holmberg, 1989; Peters, 1983). It also assumes technologies are inherently neutral systems; therefore, their design and application are the only aspects of the systems with research value (Peters, 1983). By endorsing distance education and neutralizing technology to one aspect of its use-value, research under the dominant ideology can consistently show the benefits of the system rather than point out discrepancies or inequalities (Sumner, 2000).

Critical theory contends that the development of higher education is as political an issue as the development of all societal structures, and therefore the relationships between players and organizations must be incorporated into an historical review (Giroux, 2008). The neutrality of technology is thus not only a topic for debate, but a proven false presumption; technology is as politically charged as other systems and signifiers (Feenberg, 2003), and when viewed strictly from a use perspective, its results will side with the dominant ideology utilizing it (Nipper, 1989; Sumner, 2000).

This paper utilizes the critical theory framework in order to provide a more equitable account of the development of the MOOC as a learning system by focusing on its development as a web of power, policy and technology rather than an abstracted technological model of newness. The MOOC can be both borne of multiple histories and ahistorical at the same time, because the manner in which the MOOC is portrayed within society becomes as much a reality as the preceding systems and models that paved the way for the MOOC's introduction.

Research Design

This paper utilizes the Delphi method, a research protocol designed to engage a number of experts around a topic and to spur experts to provide feedback, forecasting and in some cases consensus through controlled feedback (Linstone & Turoff, 2002). The original Delphi study was developed by the RAND Corporation in an effort to forecast potential obstacles surrounding a topic in the Air Force (Linstone & Turoff, 2002). Since then, Delphi research has been regularly used by researchers and practitioners to coalesce experts around a topic in an effort to forecast potential futures or find consensus on a potential course of action (Martino, 1993).

In a Delphi study, a group of experts is organized to share their thoughts and opinions on a subject of phenomenon with a limited field of research and/or contradictory evidence (Skulmoski, Harman, & Krahn, 2007). Experts respond to prompts provided by the researcher, who then aggregates the information and feeds it back to the experts in a new iteration. Over the course of several questionnaires, experts are asked to not only take a stand on issues within the field but to also provide rationale for the stand, and in subsequent iterations defend those statements or create new knowledge based on the responses of other experts (Hasson, Keeney, & McKenna, 2000).

A Delphi study is an ideal research instrument for this topic for a number of reasons, most notably the relative infancy of the subject matter. The MOOC is a new phenomenon with a limited body of scholarly research, and Delphi studies are ideal for establishing expertise and foundation in such a young field (Skulmoski, Harman, & Krahn, 2007). The Delphi study provides an exploratory research technique that utilizes diverse expertise in the goal of forecasting futures or developing a present consensus (Wissema, 1982). Unlike a survey provided to a larger sample size, a research instrument that assumes existing dominant

knowledge and attitudes in a field (Wilhelm, 2001), Delphi approaches expertise as multi-faceted and evolving, allowing for the collection and display of various ideologies regarding a subject. Delphi is also an ideal methodology when practitioners and decision-makers are interested not only in the opinions of experts, but in seeing those opinions explored through a rigorous scientific instrument, with the potential for consensus or future solutions to appear (Wilson & Moffat, 2010). Through controlled feedback, experts have the opportunity to share ideas and form consensus based not only on their philosophy and worldview but that of the panel through an iterative process, whereas a survey limits respondents to one round of answers and lacks ability to engage experts in furthering their answers and the research questions, as well as negating a consensus or problem-solving.

Significance of the Study

Higher education, a societal system known historically for its glacial rate of change (Waks, 2007), is currently in greater flux than at any time in its history (Friedman, 2013a; Thrift, 2013). Some view the system as broken and in need not only of repair, but disruption and reconstitution (Barber, Donnelly, & Rizvi, 2013; Horn & Christensen, 2013), and others see the current state not as broken but as undercut due to a course of administration, policy and governance over more than 30 years (Carusi, 2013). While the MOOC is one example of a potential solution to various issues around education, no other proposed solution or educational technology has received a fraction of the attention and adulation given to MOOCs. In the short time since their emergence in the educational landscape, millions of people around the world have enrolled in university-aligned courses; millions of public, NGO and private dollars have been channeled to MOOC developers; and policymakers at institution, state and federal levels have proposed and/or enacted legislation designed to provide greater opportunity for MOOCs to

exist either in tandem with existing institutions or to create entirely new universities and credit systems. Wrapped in this movement is a narrative about the MOOC as a global agent with the potential to democratize education, allowing students of any background or history to learn from the best teachers via the best universities in the world (Friedman, 2013b; Brooks, 2012). From this perspective, the potential of the MOOC movement is greater than the sum of its parts.

Resisting the dominant ideology that education is broken, a number of educational technology researchers and scholars wish to turn the conversation toward what people mean when they say education is broken (Stewart, 2013; Veletsianos, 2013b). Why is higher education in a state of flux? Critical pedagogues point to a decline in state and federal funding of higher education coupled with an increase in both tuitions and enrollment (Giroux, 2008; Sumner, 2000). Despite putting the cost of education on students at a rate five times more than a generation ago (Lewin, 2013), colleges and universities have been unable to add tenure-level faculty positions to their institutions, instead relying heavily on part-time adjunct professors and graduate students to teach the majority of classes (Bowden & Gonzalez, 2012). It is this self-inflicted wound (Johnson, Van Ostern, & White, 2012) that disruptive technologies such as the MOOC are purported as capable of fixing. From the critical perspective, using technology in building a learning model driven by such economic forces undermines the potential for technology to better serve and engage with the primary objectives of higher education: instruction, interaction, community and wisdom. Rather than utilizing technology instruments to scale outdated pedagogical models, technology has the potential to increase the breadth and scope of student interactions with content, colleagues and experts. By focusing on an economic model and interlaced economic output of a higher education for the user, the impact technology can have on the purpose of education is lessened, rendering education to the least common

denominator of content transmission. The MOOC is viewed from this perspective as a Behaviorist or even Didactic learning model catering to autodidactic students rather than a revolution in the manner and method in which students learn (Bady, 2013b).

Those who question the validity or supremacy of the MOOC see the potential implementation of a third-party system of courses onto a university as an example of digital imperialism (San Jose State University Department of Philosophy, 2013). Implementing such aggregated content could have a number of adverse institutional effects: the positing of content authority with a limited number of voices, a continued erosion of tenure and the bonding of tenured faculty, an inability for faculty to perform research or prove the relevance of their research, and the loss of collegiate community through the increased individualization of learning environments. While the MOOC offers potential for an egalitarian view of education on a global level, its ability to reach such lofty aspirations is questionable (Bolish, 2013), and its potential to harm existing spaces of learning is highly possible (Graham, 2012).

While developers, administrators and politicians have been focused on the systematic aspects of the MOOC learning model, little attention has been paid to the effect the MOOC phenomenon has had on a sociocultural level; the MOOC discussion is not only about pedagogy, but about the shaping of educational instruction, definition of expertise, and education's broader purpose within society. The labeling of the MOOC as a disruptive technology assumes education is a commodity similar to other personal goods, a point that runs counter to the sociological definition of community. From the communal perspective (Habermas, 1991), disruption of a social structure such as higher education requires more than the introduction of a good or service, but a shift in the attitudes and beliefs of the public sphere, a shift levied as much by power relationships and mass media as by frank discussion and debate (Habermas, 1991).

While the MOOC as viewed general society may only be a learning model comprised of short video lectures and computer-mediated interactive assessment (Siemens, 2012), the MOOC's platform of educational scalability, opportunity cost and localized expertise has in a short time influenced the manner in which society view higher education. From the induction of higher education as a cultural structure nearly 1,000 years ago until recent times, higher education was considered a public good that benefitted both the citizens and the community (Pusser, 2006). Over that period of time, the idea of *citizen* changed to become more inclusive, but the public good aspect of education remained steadfast. Recent education history, focused predominantly on economics and individual objectives, has clouded whether education remains a public good or has morphed into a private one (Kelly & McShane, 2013). The manner in which the MOOC exists in the public sphere will make a great difference in how citizens view and value instruction, expertise and whether education remains a public good.

Summary

The emergence of massive open online courses into the sphere of higher education has brought with it attitudes and actions of change and disruption. The majority of discussion focuses on the structural manner in which education is delivered rather than the value of educational elements such as instruction, expertise and a higher education's societal value. This Delphi study will study the historical evolution of both higher and distance education, incorporating field experts to consider how MOOCs have affected education's trajectory and imagine future outcomes for the institution.

Chapter 2: A Review of MOOC-related Literature

At initial glance the MOOC's model of one-way, materials-driven instruction seems to share a great deal with decades-old distance education pedagogy, as initially envisioned through correspondence courses and later radio and television broadcast. As with the MOOC, this model of broadcast education was intended to reach learners unable to attend a regular campus class (Schramm, 1971). While the MOOC incorporates discussion boards as a feature for two-way communication, such communication is not with the professor, and research regarding online discussion boards has shown their strength when used as an interactive supplement but not as the primary interactive lens (Chou, 2012). MOOCs are not a new iteration of an old idea, however, at least not entirely. The primary difference is the technical platform MOOCs are built upon, and the potential for such a platform to alleviate the pedagogical issues that arose within prior versions of massively scaled distance education.

This chapter reviews the existing literature associated with massive open online courses, both directly and indirectly. The review incorporates literature from congruent fields and models due to the critical framework of the research, as well as the relative infancy of the learning model. To understand this potential and consider the extent to which MOOCs are able to reach it, this chapter begins with an examination of the MOOC's brief history from the perspective of developers and mass media, and its parallels and connections to the history of distance education. The second half of the chapter will focus on elements outside of the structural history of MOOCs and the opposition ideologies regarding the learning model and its assumptions.

Foundation & Definition

Defining the massive open online course has proven difficult for scholars and the general public (Daniel, 2012). There is no standard definition of a MOOC, and the ambiguity within the

field of study has allowed the term to be used for a number of educational platforms, models and styles with seemingly little in common (Watters, 2012). As this chapter will note through exploring the history and structure of the MOOC, several common elements have emerged: an association with existing higher education structures (either through development or implementation), a need for technology to provide connection to professors and materials, a tacit requirement of some level of prior content knowledge, and a space for two-way communication between students or a student and a instructional figure such as a teaching assistant. However, such elements are emblematic of casting a wide net that promotes inclusion, as the above signifiers could be used to classify a number of learning environments that have existed since the advent of computer teleconferencing. While debate continues on how to adequately define the phenomenon of massive open online courses, for the purposes of this research paper the four tenets of the term MOOC are defined as follows:

Massive. Massive relates both to the student experience as well as the structure of the system. For a course to be massive, it must not only be open to a significant number of students, but in so doing it must scale learning materials, projects, assessments and outcomes in a manner so that all students receive a similar course experience. The use of the word *significant* to describe class size is purposeful; what several hundred or several thousand students may be significant in one learning environment, another learning environment may require tens of thousands of students to be significant. It is the issue of scalability that makes Massive a contentious term, as MOOCs associated with the connectivist theory of learning promote a hybrid of standardized elements with unique artifacts brought forward by class participants, creating expansive differences in projects, assessments and outcomes. This dissention around connectivist MOOCs will be explored later in the chapter.

Open. Open refers to the opportunity for students to enroll in the course at no monetary cost. Such a definition of *open* is also disputed in scholarly debate; pioneering work in MOOCs came from the Open Educational Resources (OER) movement, where not only was monetary cost neutralized but the course content and learning materials were removed from existing structures of ownership and authority and promoted as free, ubiquitous and remixable in the creative commons (Downes, 2013). To the pioneers who have defined and spearheaded the open movement, *open* stands for more than a monetary price; however, within the mainstream understanding of the MOOC, *open* focuses primarily on the lack of cost for course and institution enrollment. This debate will be explored later in the chapter.

Online. Online deals with the mode and method of course access and activity. In the instance of MOOCs, every element of the course a student is believed to need for successful completion is housed online: lecture, assignments, supplemental materials, assessment, communication. This is not to say that there are not opportunities for students to engage the material off-line: most MOOCs encourage students to form study groups either through the use of social media or in developing face-to-face groups around geographical locations, and recent MOOC initiatives have partnered to offer courses at existing higher education institutions where students have face-to-face access to teachers and students; however, these elements are not considered mandatory to a student's success. There are also incidences of MOOCs requiring students to purchase textbooks. Such instances are infrequent, and would be at odds with both the *online* aspect of the MOOC as well as the *open*.

Course. Course is a term used to denote the registration and association with an affiliated instructional group, as well as the course's existence in space and time. A course therefore requires a registration with the instructional group and a designated time period over

which the course progresses. Such a definition removes self-paced courses from the MOOC definition, despite their association with existing MOOC developers and providers.

The Dominant Ideology Perspective

Defining existing practices as archaic. MOOC developers and those cited as inspirations for the phenomenon see the structure of contemporary education spaces as no different than that of Prussian schoolhouses 200 years ago (Khan, 2012; Robinson, 2010; Thrun, 2012). Known colloquially as the Prussian Model (Khan & Noer, 2012), this model of schooling utilized compulsory education as a means to train a workforce for engagement in military endeavors and a goods-based economy (Gatto, 2000). Notable in this argument is the structural idea of age-based learning cohorts, where students are organized into classrooms by year of birth. According to advocates for online learning platforms such as MOOCs, the structure of education has not changed since this model, one 19th Century newsman and politician Horace Greeley advocated for as a tenet of compulsory education in the United States (Khan, 2012). Developers of learning systems such as the MOOC see the technology as a platform space where students can engage in personalized, self-paced learning that is not driven by the median competency of the age cohort. This argument contends that online learning platforms such as MOOCs allow students to progress at their own pace through material, unencumbered by the strengths and weaknesses of classmates (Khan, 2012).

While the Prussian model of learning is more directly related to primary rather than higher education, its positioning as an antiquated stalwart of the institution & subsequent contrast to the opportunity for personalized learning via cutting-edge educational technology is similar to a longstanding structural aspect of higher education: the credit hour. For MOOC developers and like-minded individuals, the credit hour limits the opportunities of students, most notably in

tying graduation requirements to time spent in a classroom rather than focusing on measurable outcomes, or competencies (Laitinen, 2012). A system based on competencies could potentially accept measurements, such as successful MOOC completion, as evidence of ability in a subject (Parr, 2013). As of June 2013, state governments in California and Florida were debating legislation designed to establish professor-less state university systems designed to award degrees based on a competency model (California SB 520, 2013; Florida SB 904, 2013), and private universities based on competency-based learning such as the College for America, an extension of Southern New Hampshire University, had met federal guidelines to receive federal student monies such as loans and Pell grants (Evans-Brown, 2013).

MOOC history and MOOC influences. The linking of MOOCs to historical precedents and influences is found wonting in both academic and popular literature. Part of this is due to the relative newness of the MOOC, a phenomenon that caught fire at the end of 2011, but it must be noted that, when speaking about MOOCs, developers do not link the learning model to existing research, trends or prior histories (Bady, 2013b). Rather, developers have discussed their work in the context of random opportunity, a self-described bold experiment (Rodriguez, 2012), without denoting or clarifying the role of prior experiments. According to the existing literature, if MOOC developers were influenced by prior efforts in online learning, distance education, and/or educational theory, those influences were tacit (Waldrop, 2013).

This is not to say that developers have not linked their learning model to other thinkers or models. MOOC developers such as Thrun (2012) and Ng (2013), along with the developers for former open-source MOOC platform Class2Go (Wan, 2012), have noted the influence of Salman Khan, a hedge fund analyst who left business to focus his energies on the development of a platform for sharing academic tutorial videos he created for a relative (Khan, 2012). His

enterprise, Khan Academy, is an educational website that aggregates short video tutorials based around common academic subjects. Recent efforts to expand the scope and abilities of Khan Academy have focused on adding assessment tools as well as data collection for teachers to utilize in their own classrooms (Walsh, 2012).

Khan himself does not link his influences in the development of Khan Academy to historical precedents or educational theories, rather noting that much of his inspiration was based on practice and intuition rather than academic research (as cited in Noschese, 2011):

> Every time I put a YouTube video up, I look at the comments — at least the first 20, 30, 40 comments that go up — and I can normally see a theme… I think it's nice to look at some of the research, but I don't think we would… and I think in general, people would be doing a disservice if they trump what one research study does and there's a million variables there. (para. 3)

The research Khan does cite comes from cognitive science, a psychological field dedicated to interpreting how the brain interprets information via thought (Khan, 2012). Within education, cognitive theory seeks to utilize the nature of the brain's ability to store memory and utilize prior knowledge in undertaking complex or multi-step problems (Bruning, Norby, & Schraw, 2010). While important to the development of learning theory over the past 40 years, its current place in the canon of educational theory is as a stepping-stone to more modern theories, an important step in the development of learning theory but not the destination (Fosnot, 1996). However, this focus of memory, recall and learning styles synonymous with cognitive learning theories are similar to the personalized aspects of MOOC technologies afforded to students (Siemens, 2013a).

It is similar cognitive research that Anant Agarwal, the director of MOOC organization edX, heralded as a must-read (Rivard, 2013a) for anyone involved in higher education instruction. The paper Agarwal heralded was a 1972 review of existing memory-based research and a proposal for unique methods to consider information processing in context to memory (Craik & Lockhart, 1972). Similar to Khan (2012), Agarwal (as quoted in Rivard, 2013a) noted how his scholarship and methodology toward MOOC pedagogical practices was similar in scope to the study prior to reading this research, saying, "If we followed [this research], it was completely by accident." (para. 10)

The initial MOOC. The course credited with catalyzing the buzz around MOOCs was Stanford University's Fall 2011 *CS 271: Introduction to Artificial Intelligence*. Taught by Sebastian Thrun, a professor at Stanford, and Peter Norvig, the Director of Research at Google, CS 271 was a for-credit course at Stanford University which Thrun and Norvig mirrored as a no-credit course through Stanford's website, one of three such courses offered that semester by the University. Thrun and Norvig utilized a learning management system to host short videos, quizzes, tests and discussion boards for individuals who wanted access to the same material as Stanford students. Students at the University and online thus had the same content and assessment materials, regardless of prior knowledge, collegiate experience or socioeconomic status (Cheal, 2013). The course resembled a traditional face-to-face lecture hall course (Vanderbilt, 2012), with content delivered through online videos, the videos divided into eight-to-ten minute sections. There were no required purchases for online students, as all information necessary to take and succeed in the course was available within the course site system, with lectures and linked supplemental materials providing all reference the course would require. Assessment was achieved through lecture quizzes embedded within the Stanford course site, as

well as traditional examinations, also delivered through Stanford's LMS. Most notably, connection and communication between individuals was not a requirement of the course.

The course was not described as a MOOC by the professors, but rather a bold experiment in distributed learning (Rodriguez, 2012). For students taking the course in-person at Stanford, the experiment and its opportunity to procure content and complete tasks through the Internet led to a campus migration to the MOOC site, with only 30 students attending face-to-face lectures by the end of the term (Watters, 2012). The experiment resulted in an online enrollment of over 160,000 individuals (Friedman, 2012), and a substantial amount of press, including an American Ingenuity Award from the Smithsonian Institute for Thrun (Vanderbilt, 2012). Thrun, who prior to CS 271 had vacated his tenured position at Stanford in order to focus energy on developing a driver-less car (Leckart, 2012), utilized the energy behind his experiment to create MOOC provider Udacity, a for-profit organization independent from colleges and universities.

MOOC explosion. CS 271 was not the only MOOC offered by Stanford in the fall of 2011. Computer Science professor Andrew Ng led the course CS 229: Machine Learning, and Computer Science professor Jennifer Widom taught the course CS 145: Introduction to Databases. Over 104,000 enrolled in CS 229 (Kolowich, 2012), and over 65,000 enrolled in CS 145 (Ng, 2013). This success in part led Stanford to devote research hours to developing MOOC platforms and providing courses for other MOOC organizers. The success also led Ng and fellow Computer Science professor Daphne Koller to organize a MOOC provider external to Stanford, Coursera (Watters, 2013a).

The number of MOOC platforms, MOOC organizations, education institutions affiliated with MOOCs and MOOCs themselves increased substantially over the next 12 months, to the point that technology, education and mass media identified 2012 as the Year of the MOOC

(Pappano, 2012; Watters, 2012). The frenzy with which MOOCs and the MOOC discussion moved through higher education, an institution considered to implement change at a glacial pace (Waks, 2007), was unprecedented (Waldrop, 2013). Pundits and educational technology professionals linked this energy to the MOOC as evidence of the platform as a disruptive technology (Regalado, 2012; Shirky, 2012). Linking both the current state of higher education and the fast development of the MOOC to previous innovations and disruptions in technological sectors, Internet scholar Clay Shirky saw the MOOC as a solution for a world of individuals who either cannot afford higher education in its traditional state or will not receive a proper value for the cost of their college experience. For Shirky (2012), not only could MOOCs shorten the gap between cost of college and monetary benefit of degree, but MOOCs also had a greater potential than the existing system to better their offerings:

> And once you imagine educating a thousand people in a single class, it becomes clear that open courses, even in their nascent state, will be able to raise quality and improve certification faster than traditional institutions can lower cost or increase enrollment…Things That Can't Last Don't. The cost of attending college is rising above inflation every year, while the premium for doing so shrinks. This obviously can't last, but no one on the inside has any clear idea about how to change the way our institutions work while leaving our benefits and privileges intact. (para. 44)

Horn & Christensen (2013) echo similar sentiments, going so far as to label the MOOC a disruptive technology, acknowledging its similarities to existing case studies of disruption, and arguing that the MOOC will likely play an integral part in the reorganization of higher education as we know it.

The most noteworthy argument for the MOOC as a disruptive technology may be its economic partnerships with private, non-profit and public funds. As defined by Christensen (Bowers & Christensen, 1995), a disruptive technology initially establishes its market by serving consumers ill-affected by or unable to enter the existing market. Education has historically been funded through government subsidy and personal payment, though the ratio of government to individual has changed over the past several generations (Oliff, Palacios, Johnson, & Leachman, 2013). The addition of venture capital and grants from foundational philanthropies (Watters, 2012) into the development of MOOCs disrupts the traditional alignment of who pays for the service of education, in a way creating a new market. The growth of MOOC financing has led an existing marketplace player, state and the federal government, to reposition its finances. While these governments have funded online and distance education ventures throughout their histories, the mechanisms to procure and distribute such monies existed within traditional higher education, such as the University of Nebraska receiving a federal grant to establish Nebraska Educational Telecommunications (Schramm, 1971). Repositioning the ability for educational innovations such as MOOCS to receive federal student aid money would provide greater revenue streams for MOOC development while cutting away at the rotten tree of traditional higher education (Shirky, 2013).

Previous institutional models of online learning. Some of the reticence toward MOOCs as a disruptive technology and an agent of educational democracy view the MOOC as the most recent in a history of prior initiatives to expand the institution of higher education outside university walls. This history dates back to the mid-19th Century and the development of correspondence courses. Despite successful courses and integration into accredited institutions throughout Europe, correspondence courses did not sustain in America, the most notable failure

the creation of Correspondence University through Cornell, a multi-year initiative that never enrolled a student despite costing hundreds of thousands of dollars (Gerrity, 1976). While distance education measures have been attempted by traditional institutions a number of times since, none were considered successful, likely in part due to higher education's longstanding questions about the rigor and effectiveness of distance pedagogies (Twigg, 1996).

It is important to note that the lack of success in establishing accredited, large-scale distance education programs throughout the history of American education is somewhat unique in the history of distance education around the globe. Prior to Cornell's experiment with Correspondence University, European countries such as Germany and Great Britain had established accredited degree-granting colleges and universities, most notably the University of London (Harte, 1986). Distance education has continued to flourish internationally as both academically rigorous and pedagogically relevant, with distance education programs regularly making international rankings of collegiate effectiveness (Wyatt, 2005).

The instrumental educational innovation to receive the greatest attention in America was Computer Assisted Instruction (CAI). After World War II, as computers and computer science extended from military sciences into higher education, universities and computer developers saw an opportunity for computing to have a positive effect on campus learning, most notably the ability for colleges to use computers as teaching tools to help offset the rising number of college students (Reiser, 2001). Throughout the 1960s, the University of Illinois experimented with a computer system called PLATO, designed to provide curriculum and instruction to students in the same manner a teacher would (Alpert & Bitzer, 1969). In the PLATO model, a student would interact with a curriculum module using the PLATO terminal, reading content and answering questions or marking answers through the keyboard. The instruction was didactic; a

student would read information and then answer a follow-up question, the system tracking the student rather than learning based on the student's answers. While PLATO remained in circulation for over 40 years (Malikowski, 2008), it's promise to revolutionize education (Alpert & Bitzer, 1969) was not realized at the time, though technological innovations such as discussion boards, emoticons, instant messaging and even touch screens can be credited to PLATO-based research (Foshay, 2004).

More recently, and more in line with the MOOC course model, a number of universities attempted to utilize for-profit organizations to offer low-cost courses affiliated with prestigious higher education institutions. Fathom, a brainchild of Columbia University, and AllLearn, a venture developed by faculty at Yale, Oxford, and Stanford, were LMS-based course aggregators offering university-level courses online at a cost lower than tuition. The design of both Fathom and AllLearn mirrors the current design of MOOCs: courses shorter than a traditional semester, videotaped lectures, discussion boards, and interactive assessment (University Business, 2006). However, courses through Fathom and AllLearn were not available for credit as such a system was not considered financially viable, and the rising tuition for consumers, coupled with no other revenue streams for the organizations, led to the closing of both ventures (University Business, 2006).

Three generations of distance education. The issue of offering degree-based credit for distance courses has historically been contentious in America (Katz, 2003), but distance education has been a viable mode of higher education worldwide since the University of London established its International Programme in 1860 (Lei & Zhao, 2007). While remaining tied to existing notions of educational structure and assessment, this form of education came with opportunities and problems unique to traditional, face to face education; therefore, a subset of

education researchers formed to focus on educational means and pedagogies for students, faculty and staff working without geographic proximity. Historians and scholars within the field traditionally view the growth of this field as generational, evolving with the technologies of the day that allow varied transmission of content (Nipper, 1989; Peters, 1983). For these scholars, distance education is a structure made possible by the industrialization of the printing press for curricular materials, the advent of a penny postal system for transmission of information, and a societal lifestyle shift from rural homesteading to urban city centers.

The concept of a generational evolution of distance education is attributed to Soren Nipper (1989), who saw correspondence transmission of content as the first generation of distance education, and media-enriched transmission via radio and television as the second generation. The third generation, computer conferencing, was for Nipper a seismic shift in the notion of distance education. The first and second generations of distance education consisted of content transmitted from a sender to a receiver, with no opportunity for the receiver to do more than perform an assessment (Bates, 1993; Nipper, 1989). Computer conferencing, the structural change in the third generation, provided students the affordance for interaction in two-way communication with the instructor as well as students either in real-time or asynchronously, in a space accessible and editable by both student and instructor. Distance education, a subset of higher education heretofore considered authoritarian and isolating, now could be democratic and social:

> Accordingly, it has been said that distance education turns the learning process into something very individual. It could be argued that learning is always and of its very nature an individual matter. From my cultural perspective, I would say the contrary.

> Learning - although a very *personal* matter - must never be an *individual* matter - one learns best by and with others. (Nipper, 1989; p. 66)

More recent scholars have amended Nipper's generational taxonomy to differentiate between various technological uses (Taylor, 1995), but the shift from one-way technologies to two-way technologies remains the focus of modern distance education scholarship. In this shift, computers provide the opportunity for quality interactions between members of the learning experience, providing a rich class experience and environment (Garrison, 2009).

The Interaction Equivalency Theorem. Despite the availability for distance learners and educators to engage in two-way coursework communication in the computer generation, not all distance education research sees two-way communication as necessary for learning. Anderson (2003) reviewed the history of successful distance education practices to develop a theory for faculty and instructional designers to adopt in developing distance education offerings. Called the Interaction Equivalency Theorem, Anderson posited that two-way communication was not necessarily a pre-requisite for interaction or even educational impact:

> Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student–teacher; student-student; student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience. High levels of more than one of these three modes will likely provide a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences. (Anderson, 2003, para. 11)

For Anderson, if a student has no interaction opportunities with the course instructor or fellow students, the course can still be a successful endeavor if the content is designed and organized at a high degree. Translating this theory to the MOOC phenomenon, MOOC platforms allow for

engineered content as well as opportunity for student interaction, which Anderson notes as the requisite for strong learning outcomes: "…high levels of learning can and do occur when any of these three modes of interaction are at a high level. The other two may be reduced or even eliminated. However, additional forms of interaction may enhance teacher and student interaction, but these come at a cost of time and/or money" (Anderson, 2013, para 18). For Anderson, while an enhanced learning environment would include interaction opportunities, successful learning is possible and in evidence without such affordances.

Distance education as industrialized model of learning. As mentioned previously, the field of distance education largely roots its history in structural changes to the transmission of information. This idea of education as a technological structure can be traced within the literature to Otto Peters (1983). Contemporary leaders in the field of educational technology and MOOCs have positioned their technologies as a wave of innovation in a system inert for over 100 years (Khan & Noer, 2012; Thrun, 2012), but Peters traces the inertia back to the Renaissance, arguing the advent of distance education was the first change to the system, and positioning a concept of distance education that promotes flexibility, efficiency and scalability (Peters, 1983). To accomplish this, the historical notion of a singular instructor, who throughout history has been a lone person involved in numerous aspects of a student's education within a course, is replaced, and the instructional labor is divided into multiple positions filled by multiple individuals, each focused on one aspect of the learning process:

> In distance study the teaching process is based on the division of labour and detached from the person of the university lecturer. It is therefore independent from a subjectively determined teaching situation…the division of labour and the objectification of the teaching process allow each work process to be planned in such a way that clearly

> formulated teaching objectives are achieved in the most efficient manner. Specialists may be responsible for a limited area in each phase. (Peters, 1983, p. 98)

Stressors of time and money in the distance education field can be minimized or removed if the notion of instructor changes from a singular entity to a group of specified experts. In this argument, the scalability of distance education requires hyper specialization of the various aspects of a student's matriculation through a course: admissions, development of materials, production of materials, production of supplementary materials, development of assessment, grading of assessment, tutoring and retention. According to Peters, passing this work out to multiple individuals allows not only to scale the initiative, but to potentially achieve greater outcomes: experts can develop the materials and leave the referencing and production of materials to others, pedagogues can focus on coaching and tutoring, and professional colleagues or even prior students who are not considered high-tier experts can fill the positions of grading and retaining (p. 99).

Many elements of the industrial process are evident in the present development of MOOCs and other educational technology initiatives. MOOC organizations such as Coursera and edX provide a platform and infrastructure for institutions such as Harvard and Stanford to house courses. Most of the grading of MOOC assessments is automated (Vanderbilt, 2012), including a prototype to automate the grading of written work (Markoff, 2013). In instances where a human element is required to assess work, the job is most often left to the students in the class itself (Kolowich, 2012). The professors spend the majority of their energy into developing content and filming lectures. The coaching and tutoring that happens on discussion boards is largely if not entirely crowdsourced via the student body (Solomon, 2013), though MOOC

providers have encouraged faculty to seek out former students or school alumni to assist with those services (Andersen, 2013; Perez-Pena, 2013).

Connectivism & the original MOOC (cMOOCs). The industrialization of learning systems is not unique to MOOCs; many aspects of pre-MOOC distance education involved the specialization of resources and retention, among other elements (Markoff, 2013). The MOOC as provided by CS 271 is an example of an Intranet, where all materials necessary to complete the course are housed within the course. The boundaries of an Intranet question the meaning of both *open* and *online* within the MOOC (Wiley 2013), as there are a number of MOOCs that depend on the concept of an Internet, where various networks of information and individuals congregate and create, a concept of MOOC that originated several years prior to CS 271. Despite media rhetoric purporting the contrary (Friedman, 2013a), the term MOOC was developed in 2008, defined to describe a course experiment utilizing connectivism. Connectivism is a computer-mediated learning theory introduced by Siemens (2005), developed specifically to address the issues of a world where the vast majority of learning and knowledge are impacted by technology. While connectivism draws upon prior learning theories of behaviorism, cognition and constructivism, it contends that such theories are concerned wholly with the process of learning, and in a technology-networked world, we must consider learning as it happens outside of people (such as machine learning and database aggregation) as well as the worthiness of information acquired. There is debate as to whether connectivism is a full-fledged learning theory or primarily a learning model (Kop & Hill, 2008), but recent and continuing experiments in distributed learning pinpoint connectivism, regardless of its classification, as an important mechanism in contemporary learning (Rodriguez, 2012).

Since connectivism depends not only on networks of information but networks of users both for individual gain as well as network growth (Siemens, 2005), its adoption in modern distance education provides an opportunity for individuals to create meaning, share knowledge and utilize an extensive web of networks to discern and utilize information as necessary. Siemens' most notable exploration of connectivism as a practical learning model was in 2008 through a course entitled CCK08: Connectivism and Connective Knowledge. Housed through the University of Manitoba, the course utilized the idea of open networks of information and users by opening enrollment to students outside the University's system, free of charge. While not the first online course to open its enrollment outside institutional walls (Fini et al., 2008; Stewart, 2012), CCK08's student enrollment numbered in the thousands led to a greater awareness of the potential of both connectivism and open online education. This resulted in educational technology researchers Cormier (2013) and Alexander (2008) to each label the experiment as a massive open online course, also giving it the acronym MOOC. For Alexander (personal communication, March 6, 2014), this acronym was a nod to various multi-user Internet platforms such as MOOs, MUDs and MMORPGs.

Open online offerings similar to CCK08 grew after the open success. These offerings were not all unique to connectivism or, in some cases, not even built upon connectivism as a learning theory, but had elements in common with CCK08 in terms of pedagogy, affiliation and assessment. In line with an attitude of networked users learning from each other, these courses, referred to by some researchers as cMOOCs (Rodriguez, 2012), resist the notion of a student/teacher or novice/expert paradigm, choosing the term facilitator for the people organizing the environment (Couros, 2010). While early versions of cMOOCs were credit-based institutional courses offered for credit-less participation to the greater population, the majority of

work within the course happened outside of the University's web presence or learning management system, instead occurring across various information and user networks the courses identified, encouraged, adopted and subsequently grew (Siemens, 2012). Out of these networks grew instruments by which students showed their learning: blogs and webpages to create digital artifacts denoting the learner's understanding of the content as part of the network as well as their individual practice. Such assessment strategy is congruent to the self-directed, lifelong learning history of distance education (Garrison, 2009), as well as the adult learning theory heutagogy, which views learner-generated content as a touchstone for high-quality adult education (Blaschke, 2012).

When Stanford announced its AI course would be available online for free with no enrollment cap, it was Siemens (2011) who labeled the initiative a MOOC:

> MOOCs are great opportunities to connect with colleagues from around the world and develop a broad understanding of topics from diverse perspectives. Our goal, since CCK08, has been to do for teaching and learning what MIT did for content…education is ripe for change and transformation and alternative models, that take advantage of global connectedness, are important to explore…(L)earning in a global cohort is an outstanding experience – networking on steroids! (para. 1)

Here, Siemens reinforces the pedagogical hallmarks of MOOCs as defined through his CCK08 experiment and beyond: networking among students as integral to the learning process, global diversity, and a focus on teaching and learning. MOOCs, at the time, were spaces where people coalesced around a topic, explored numerous forms and visions of content, created their own learning, and through the network grew in what they understood individually as well as could access later.

The structural, theoretical and pedagogical differences between the MOOCs designed around connectivism and those designed around CS 271 have led researchers to differentiate between the two MOOC types, labeling the connectivist-driven model as cMOOC and the Stanford-based model xMOOCs (Rodriguez, 2012). This is because developers view the methods and implementation of their models in different lights: cMOOC developers see a participative pedagogical nature to their model where the technology amounts to a transformative application of computer-based learning (Siemens, 2012); while xMOOC developers link their model to behaviorist-cognitive ideals of the early 1970s (Rivard, 2013a; Siemens, 2013a) and didactic assessment practices and pedagogies, resulting in a model based on knowledge transfer.

It is important at this time to note the rationale for this paper's use of the acronyms MOOC, cMOOC and xMOOC. Due to this paper's critical theory framework, this research study utilizes the parlance of the dominant ideology, while also noting the vocabulary of resistance or marginalized ideologies. The use of the term MOOC in popular culture and most research is refers to the process of elite universities transferring courses to platforms such as Coursera and edX or the building of courses in conjunction with universities through organizations such as Udacity. This use of MOOC fits with this paper's definition of a MOOC stated at the beginning of the chapter. This paper therefore utilizes MOOC in reference to these courses, and cMOOC to reference MOOCs borne of connectivism. This paper will refrain from further use of the term xMOOC, as the term is not utilized in popular discourse or the dominant ideology, and while the term could have merit defining characteristics regarding the CS 271 model of MOOCs, its use in academic circles is largely pejorative (Porter, 2013). However, choosing not to utilize the acronym xMOOC does not denote a failure to engage the MOOC in a negotiated or resistance interpretation. The use of dominant terminology and parlance in this

research comes with an understanding that the delineation of MOOC, xMOOC and cMOOC seen in most writing and reflected here plays into the notion of the MOOC as an ahistorical learning model (Bady, 2013a) by utilizing the same term to denote incongruent learning models.

MOOC pedagogy. Due to the growing spotlight on MOOCs as a disruptive technology (Friedman, 2012) or even educational salvation (Pappano, 2012), MOOC developers have increased their efforts to discuss the theoretical and pedagogical foundations of a MOOC. Specifically, developers such as Thrun (2012), Koller (2012) and Ng (2013) have linked their pedagogical practices to the learning and teaching model known as the flipped classroom. There is a debate as to when the flipped classroom was first introduced into education (Watters, 2012), but its recent rise in notoriety coincided with both an International Society for Technology in Education pamphlet celebrating the methodology (Bergmann & Sams, 2012) as well as the growth of Khan Academy. Developers such as Ng, Koller and Thrun have directly linked their inspiration for the MOOC's potential to the success of Khan Academy.

In a flipped classroom, students are expected to view lecture materials via streaming video or podcast from home. Once at school, class time can be dedicated to mastering the skills and content derived from the video, through assessment strategies such as homework and problem solving (Bergmann & Sams, 2012). Removing content delivery from the classroom day frees up school time, allowing teachers to do what Khan and Noer (2012) say they do best, presumably helping students master the content from the digital lecture.

Much of the debate surrounding the flipped classroom involves the assessment of students in a flipped versus traditional classroom; specifically whether the flipped classroom result in higher learning outcomes (Papadopolous, Santiago-Roman & Portela, 2010; Strayer, 2007). Lost in that debate is the theoretical implication of the flipped classroom, an educational

and technological innovation that assumes lecture-based, assessment-focused learning strategy is the ideal theoretical lens for learning (Nielsen, 2012). Focus on this modality, delivering lecture and surmising a student's knowledge gained through standardized assessment, is indicative of behaviorist learning theory. Behaviorism, brought to educational prominence by Skinner (1968), is a psychological theory involving the use of stimuli to change a person's observable behavior. Behaviorism is concerned with a visible mastery of content, and utilizes rewards for progress and immediate correction of incorrect knowledge. Behaviorist pedagogical practices traditionally involve direct instruction, repetition of information, situational practice of the instructed material, and positive reinforcement (Baum, 2005).

As a learning theory, behaviorism fits many of the modalities and pedagogies of the MOOC. MOOCs are focused primarily on content delivery and rigor, as well as the formality of assessment practices (Knox, Bayne, MacLeod, Ross, & Sinclair, 2012). They provide direct instruction through lecture followed by immediate assessment (Parry, 2012). Correct answers are celebrated, and wrong answers are quickly noted and the student is provided an opportunity to amend. Developers herald the immediate feedback aspect of the platform and its multiple opportunities for students to master content as proof of the MOOC's working potential (Parry, 2012).

In a learning system of automated grading, an instructor's interaction with students is limited on at least one traditional stratum. For MOOCs, the role of instructor is one of content developer and presenter (Knox et al., 2012). Teachers provide the lectures and work with a design team to break them up into short videos, and many instructors who have produced MOOC content have noted a difference between lecturing to a hall of students versus to a camcorder (Ng, 2013). MOOC Instructors, often referred to by MOOC developers as the best professors

(Ng, 2013; Thrun, 2012), have no interaction with individual students except in rare instances, most notably where an instructor spent between 450 and 600 hours dedicated to the course (Kolowich, 2013b). Questions on a discussion board are addressed either by classmates or a group of teaching assistants. Grading is either performed by students or automated, with some MOOC providers favoring automation (Knox et al., 2012). Instructors might post general notes to their class via the learning management system (Ng, 2013), or utilize qualitative or quantitative data in the redevelopment of a future MOOC (Rorabaugh, 2013), but the focus of the best professor is as a content developer and distributor.

Recent institutional and political shifts in positioning MOOC outcomes to provide credit to degree-granting institutions has put a greater focus on the assessment tools utilized by MOOCs. The evaluation practices have by and large remained automated or peer-graded (Markoff, 2013). While individual MOOCs vary their assessment strategies depending on the content of the course, MOOC organizations have encouraged professors and universities to utilize or even build curriculum to support automated grading (Knox et al., 2012). However, MOOCs that offer credit hours toward a degree have required formal examinations at the conclusion of a course, proctored by third-party testing services (Markoff, 2013). These examinations mirror what Cheal (2013) calls a traditional semester examination: a series of questions designed to assess knowledge gained, utilizing instruments such as multiple choice and equation solving.

MOOC outcomes. Much of the energy around the MOOC narrative revolves around the potential for MOOCs to address inefficiencies in the existing higher education system (Brooks, 2012; Friedman, 2013a), namely economic (Watters, 2013a). The cost of tuition for higher education continues to rise, regardless of the institution's demarcation as public, private or a

community college (Shirky, 2013). At the same time, a greater number of individuals are using mass media to question the economic value of a college degree for the individual (Bennett & Wilezol, 2013). While state governments continue a trend of cutting back levels of funding for higher education (Watters, 2012), MOOC advocates position the model and the organizations as potential saviors for quality education on a scaled level.

The first and most noteworthy example of the MOOC as a scalable salvo for higher education came in January of 2013 when MOOC provider Udacity began a trial partnership with San Jose State University to offer three MOOCs through the university. For $150, students could take a MOOC rather than a traditional course, which would cost three to four times as much in tuition (Cheal, 2013). The MOOCs were available for students in the Spring 2013 semester, only two weeks after the partnership announcement. The results of the SJSU/Udacity trial was identified by those involved saying they "weren't as high as we hoped" (Cheal, 2013, p. 7), and when the project was suspended in November of 2013 many decried it a failure (Hill, 2013b; Schuman, 2013). However, neither San Jose State University nor Udacity have stopped utilizing MOOCs in higher education: MOOC provider edX offers MOOC course curriculum to 11 schools in the California State University system through a negotiated partnership, and Udacity has partnered with telecommunications company AT&T to produce and offer a complete a Master of Science degree in Computer Science at Georgia Technical University (Moe, 2013).

The partnerships between universities and MOOC providers to offer college credit are not the only avenue to making college degrees more affordable through use of MOOCs. Both the states of California and Florida have introduced legislation designed at making it easier for earned MOOC credits to be put toward a college degree, either through requiring schools to accept MOOCs as transfer credits, or establishing state institutions to award degrees based on a

number of non-classroom factors such as MOOCs, concurrent high school credits, or competency-based examinations. The latter mirrors an initiative from College for America, a non-profit organization developed through Southern New Hampshire University that awards an associate's degree based on the mastery of 90 competencies, measured through projects and examinations. Removed from the credit hour as degree currency, College for America recently received approval from the US Department of Education, meaning students can receive federal financial aid money to attend (Parry, 2012).

MOOC providers also argue the benefit of their materials at traditional, face-to-face campuses. The previously mentioned California State University/edX partnership began initially as a San Jose State University partnership with edX regarding curriculum and materials for SJSU's course Electrical Engineering 98: Introduction to Circuit Analysis. SJSU professors utilized the edX materials in a flipped classroom style, opening up the scheduled class time for various practice and instruction as deemed by the on-site professor. SJSU and edX reported an increase in student achievement from a 40-59% pass rate to 91% (Cheal, 2013). This result has led to SJSU, "Silicon Valley's Public University" (Schaffhauser, 2013, para. 1), to further their materials & curriculum partnership with edX to cover more course offerings next year, as well as a greater edX curricular footprint throughout the California State University system.

MOOC providers outline the benefit of educational outcomes not only for domestic college-age students, but individuals the world over (Brooks, 2012; Friedman, 2013a). Many stories in the media regarding MOOCs pinpoint the global effect of the MOOC and the continued potential, where professors are viewed as rock stars (Friedman, 2013b), courses can break down longstanding attitudes toward gender and class (RevolutiOnline.edu, 2013), and anyone with access to the Internet can receive the highest of quality educations (Friedman,

2013a). While the majority of universities associated with MOOC providers remain American, the number of global universities offering MOOCs through MOOC organizations continues to increase (Ogrizek, 2013).

MOOCs – A Subversive Ideology

The viewpoint of educational history from a structural lens negates the multitude of influences that have shaped higher education as an institution and within our society: historical, political, social and cultural. Defining the MOOC entirely as a system relegates education to a tradable commodity, a position at odds with longstanding beliefs on social science and culture. This section looks at education from a myriad of lenses contrary to the education-as-business-model paradigm.

A philosophical history of education. Arguing the structural elements of the education system negates a discussion of the purpose of higher education, especially with the present-day societal schism regarding what purpose higher education should serve, namely whether higher education is an individual interest or a societal one (Sahlberg, 2011). This is not a new debate (Powell, 1971); however, a decrease in the government funding of public education coupled with an increase in student enrollment has rekindled the topic (Chomsky, 2013). Those who see the interest as pertaining to the individual believe the system exists as an input-output model and the user receives the majority of benefit and thus should bear the brunt of cost (Bennett & Wilezol, 2013; Powell, 1971), while those who see the interest as communal believe the system is rooted in societal structure and cost should be highly subsidized or borne entirely by the society that will share benefit with the student (Chomsky, 2013).

When higher education was first established as an institution separate from church control, the purpose was both (Siemens & Matheos, 2010). Higher education has roots dating

back to Hellenistic societies and later the Catholic Church, but its emergence as an institution in and of itself came at the dawn of the second millennium, the earliest including the University of Bologna and the University of Paris. Students of aristocratic lineage with pre-requisite knowledge of the trivium and quadrivium were invited to study a core curriculum in liberal arts, sciences, classical antiquity and theology, with further study of those disciplines or law and medicine available upon core completion. The goal of these universities was twofold: to produce young scholars and professionals, and to encourage the growth of community and civic society (Sahlberg, 2011). Certainly there was benefit to the individual, but in an aristocratic society that benefit was secondary to a birthright benefit, thus Universities established their missions as utilizing scholarship to improve community and society, both for academic disciplines as well as the environment of the University and its outlying community (Siemens & Matheos, 2010).

Higher education remained a missive of the aristocratic class until the mid-18th Century, when the idea of access to higher education first opened to individuals outside a noble birthright. Some scholars credit the Enlightenment for shifting these opinions (Kurtz & Madigan, 1994), extending the idea of formal education to a larger population. In America, Thomas Jefferson envisioned a system of compulsory education for men that would cover primary school and higher education (Addis, 2003). It would be fully removed from religious indoctrination and built on principles of scientific inquiry and civic engagement. Most of all, Jefferson believed its greatest benefit would be to the society, saying, "No one more sincerely wishes the spread of information among mankind than I do, and none has greater confidence in its effect towards supporting free & good government" (Wagoner, 2004, p. 21.). Whether rhetoric or substantiated

belief, the importance of a more inclusive and civic higher education system became a hallmark of American educational policy initiatives.

Noteworthy examples of an American belief in democratizing education are the Morrill Land-Grant Act, the GI Bill and the Higher Education Act. The Morrill Land-Grant Act provided parcels of land to every state for purposes of establishing universities designed to provide working and industrial class citizens with greater educational opportunities. Every state received 30,000 acres of land for each national representative the state sent to Congress, land they could either use directly to build a University or sell and use the proceeds to build a university. While a great deal of attention was paid to the bill's focus on engineering and agriculture, policymakers linked the bill's history to the educational beliefs of Jefferson (Gutek, 1972), noting the importance of teaching liberal arts and sciences in conjunction with the advertised practical skills.

What the Morrill Land-Grant Act did for establishing a University system in America, the GI Bill did for increasing enrollment in higher education. Officially known as the Serviceman's Readjustment Act of 1944, the GI Bill provided veterans with a variety of provisions and benefits for their service, most notably the remission of state university tuition and fees (Gutek, 1972). Not only did the GI Bill catalyze an explosion in college enrollment (Kiester, 1994), but it laid the foundation for the emergence of an American middle class through a rise in home ownership, proliferation of small business start-ups, and an increase in a common societal and citizen education (Adams, 2000).

The Higher Education Act of 1965 was designed to provide a greater amount of federal funding to the higher education system, providing fiscal opportunities to students through a loan program, need-based grants, and work-study opportunities. Students who could not afford the

cost of higher education had a number of choices to find monetary assistance, an effort to further democratize educational access to all citizens regardless of financial mobility. The Higher Education Act of 1965 marks the final example of federal policy geared at the democratization of higher education in America. Researchers point to the decline of corporate profits in conjunction with the Vietnam War as a primer for the suspension of education policy and subsequent retrograde initiatives (Hursh, 2007). Businesses, still frustrated by the passing of the GI Bill (Fones-Wolfe, 1995), were unable to pass cost increases onto consumers in a highly competitive global economy (Parenti, 1999). Their solution was to push for policies that both lowered wages and scaled back corporate regulations. Over the course of a decade, American policy transitioned from social and interventionist to personal and monetarist, leading to an age of neoliberalism (Harvey, 2005).

Neoliberalism & the education effect. Neoliberalism is a political and economic theory based on an idea that a free commercial market is most suitable for all aspects of a society because competition will drive businesses and stakeholders to improve their services and thus the society (Olssen, 2004). The term has been in use since the 1960s, and the current iteration has a number of contradictions from the original definition (Boas & Gans-Morse, 2009), but neoliberalism gained its prominence as a term to describe the political ideologies and actions of a number of free-market politicians and governments first established in the late 1970s, most notably America's President Ronald Reagan and Great Britain's Prime Minister Margaret Thatcher. Both Reagan and Thatcher embarked on political maneuvering that lessened the regulations required of businesses and corporations, cut various social services, and decreased taxation that paid for public works such as infrastructure and education (Harvey, 2005).

The transitioning of higher education from a public good to a private entity is indicative of neoliberal policy initiatives. From this perspective, despite the number of American colleges registering in the thousands, the higher education system is argued to run without competition, allowing it to become bloated (Greene, 2010). Within this framework is the notion of individual responsibility and meritocracy, the idea that an individual's status in the socioeconomic climate ties directly to their abilities and efforts (Douthat, 2005). Evidence of an ineffective educational system in concert with a lack of individual effort is described in the National Commission on Excellence in Education's 1983 report *A Nation at Risk* (National Commission on Excellence in Education, 1983): "…the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people" (p. 3). Neoliberal policies that lower taxes, lessen government subsidy and encourage the footprint of private enterprise therefore can allow competition to enter the educational marketplace and fix the educational crisis taking hold in America (Greene, 2010).

Where did the education crisis come from? According to critical theorists, the decrease in measured educational outcomes has a direct correlation to the decrease in governmental funding of education (Ginsberg, 2011). As funding for K-12 and higher education has decreased, measurements of student success have decreased as well, leading to an increase in media attention to an education crisis. Despite a direct correlation between the crisis and a lack of funding, media and policymakers call for intervention to fix or replace the broken system, leading to the development of either private enterprise in the system, such as for-profit accredited universities, or public-private partnerships, such as outsourcing departmental curriculum and developing massive courses for a wide audience. Solutions to the educational problems focus on

measurable success and the lessening of the economic footprint, either for the taxpayer or the user (Bennett & Wilezol, 2013).

This neoliberal model sits in stark contrast to the public good of education as envisioned by Jefferson and supported through nearly the first 200 years of America's independence. Rather than viewing education as a social and cultural good that improves civic life and the strength of the democracy, education is an individual pursuit that should be financed by the individual. It is the responsibility of the user to provide the financing, and if a user cannot provide the financing, they do not get access to the service. This makes the consumer free market not only the epicenter of society in place of social institutions, but places an intrinsic value on the ability for individuals to interact with commerce (Hursh, 2007).

In a globalized society, neoliberalism is purported to be the inevitable result of international commerce (Fairclough, 2003). From this perspective, with a greater number of suppliers available, competition for goods and services both drives down prices while ensuring quality control through this competition. Education, traditionally a localized affair dependent on an environmental space for individuals to congregate around an expert, not only can be opened up to digital environments through ventures such as a MOOC, but unlike prior ventures in distance and online learning, MOOCs carry cultural capital in the form of institutional and professorial status.

MOOC: Distance learning, online learning, both or neither? The common elements of distance education and online education, most notably the opportunity for students to engage classes and coursework regardless of geographic distance, have led researchers to link the two together, often with online education as an extension of the distance education history (Annand, 2007). However, the structural literature review as noted earlier shows a schism in the creation

and development of the disciplines. This difference is echoed in the work of Garrison (2009), who sees the history of distance education as supporting the passivity of the learner rather than activating the learner through the use of telecommunications:

> The theory and practice of distance education appears to continue to hold to the assumptions and challenges that defined the field in the 20th century; that is, independent study to cope with the structural constraints that restricted access to education [Annand, 2007]…the ideal of any educational experience was two-way communication, not independence. Separation of teacher and learner should not concede the necessity of sustained and purposeful communication. (p. 93)

For Garrison, online learning encompasses a potential for learners to communicate and collaborate no matter the geographical distance. It is this two-way communication between novices and an expert where researchers saw the potential in the early days of web-based personal computing (Bates, 1993; Nipper, 1989), as well as indicative of contemporary learning theory such as constructivism (Papert, 1993) and activity theory (Engeström, 1993).

This is not to say that online learning by definition incorporates collaborative communication. Online learning provides the ability to utilize collaborative communication as part of pedagogical practice, but the technological advent becomes nothing more than a system of delivery if used to perpetuate prior practices:

> …There are two fundamental approaches to OLL [online learning]. The first is to provide the tools and techniques for individuals to access and organize information to sustain existing distance education practices that maximize learner independence. The second is to use the full capabilities of OLL to create purposeful communities of inquiry that is currently transforming higher education based on collaborative constructivist principles.

> In essence, the first approach is to sustain current practices, while the second is to transform teaching and learning at a distance by fundamentally rethinking the collaborative nature of higher education. (Garrison, 2009, p. 96)

Attacking the idealized autodidactic notion of learner as heralded by Peters (1983), Garrison notes the importance of establishing collaboration and transaction between student and teacher rather than expecting a student to embark on the journey from novice to expert through nothing but access to self-instructional materials (Garrison, 2009).

MOOC developers share this narrative of improving the existing model in order to improve the MOOC's ability to engage in Garrison's second approach to online learning; however, existing results show little application of such learning theories and pedagogies in any iteration of the post-Thrun MOOC (Matthews, 2013). The only platform-based opportunity for students to interact is through discussion boards, an innovation shown to have little benefit when not rigorously monitored by a professional (Kay, 2006). MOOC discussion boards are almost exclusively domains for students to solicit the class collective for responses to course material with an occasional teaching assistant response (Michael Morris & Stommel, 2013), and while professors herald the opportunity for a MOOC to provide more direct communication, there is a disconnect between how people define interaction, a disconnect not uncommon to the fields of distance or online education (Garrison, 2009). Regarding communication in the MOOCs, users are skeptical of how communication is sold versus what communication entails: "Philip D. Zelikow, of the University of Virginia, put it best in his course introduction, explaining that his class would be a series of 'conversations in which we're going to talk about this course one to one' — except that one side (the student's) doesn't 'get to talk back directly.' I'm not sure this fits the traditional definition of a conversation" (Jacobs, 2013, para. 4). Developers note that the

MOOC remains in its infancy as a learning model (Ng, 2013), but this form of parrying critique by citing newness silences debatable topics regarding the initiative. Moreover, a lack of MOOC developers and luminaries to cite existing research and terminology creates an ahistorical aura around the MOOC (Bady, 2013a).

While research on the MOOC phenomenon is limited at the time of writing, MOOC developers and advocates largely do not reference educational technology, online learning and distance education research; moreover, some seem unaware of the existence of such material. Educational technology journalist Ferenstein describes the MOOC phenomenon as the early days of online education (2013) and developer Thrun noted MOOCs were a creation unique within education, a Higher Education 2.0 (DLDconference, 2012). Thrun has since modified his historical account of the MOOC and alludes to the research that came before it, but said research has yet to become a part of the MOOC debate (Lederman, 2012).

As mentioned earlier, MOOC developer Agarwal and MOOC inspiration Salman Khan link their pedagogical practices to cognitive theories of learning. This field of study at-large began in the 1960s, but early research in memory recall and information processing is initially credited to United States military exercises during World War II. At this time, cognitive science was not a field of psychological study as much as a mechanism to utilize human attributes of memory and prior knowledge in the development of machines, fields that would come to be known as cybernetics and artificial intelligence (Chamak, 1999; Pylyshyn, 1984).

Cognitive science and computer science find common ground in viewing the brain as similar to how a computer processes information: information enters the terminal, a decision is made as to how to organize it, and then a decision on what retrieval cue need be assigned to it in order to bring it to short-term memory for use and application (Norvig & Russell, 2009). Within

computer science, methods on how to achieve artificial intelligence are split: on one side is a true AI system, where the system could learn based the present interaction in conjunction with information retrieval and prior usage; and the other is the concept of expert systems, where Boolean logic allowed the system to reason its way down a taxonomy of knowledge, and the system does not change based on user interaction but rather developers change it by altering the database.

Within education, comparing the brain to a computer made of meat (Minsky, 1982) makes for an analogous summation but is factually incorrect. The desire to compare the brain to technological prowess of the day dates back to Aristotle describing the brain as a wax tablet, or *tabula rasa,* and analogies have adapted based on the technological innovation of the time: papyrus, books, television, holograms, and computers (Draaisma, 2004). Computer systems and programs can replicate the behavior of the brain in the same manner it can predict weather, but this is the manipulation of abstract symbols through highly defined rules-as-intelligence rather than the understanding of symbols as concrete constructions unique to environments (Searle, 2006). Whether an artificial intelligence system is utilizing expert system logic or is utilizing terminal interaction to grow a self-referential database, the end result is not learned material but the perception of learned material. As cognitive science and artificial intelligence are interested in how learning occurs, determining what exactly learning means in these fields is vital in understanding how learning translates from AI to education.

Distributed learning. It is important to look at Thrun & Norvig's use of the term *distributed learning*; such nomenclature identifies a verified educational model, yet it is no longer used by the MOOC developers to refer to courses like CS 271 or platforms like Udacity. Distributed learning, as defined by educators, is a learning model borne of the rise in

telecommunications technologies during the 1990s. Recently the term has been interchanged with *distance learning* (Petrides, 2002), though the academic history and general etymology of *distributed learning* do not provide a basis for substitution (Bates, 2000). Distributed learning, as defined by the Institute for Academic Technology (quoted in Bates, 2000):

> …Integrates a number of technologies to enable opportunities for activities and interaction in both asynchronous and real-time models. The model is based on blending a choice of appropriate technologies with aspects of campus-based delivery, open learning systems and distance education. The approach gives instructors the flexibility to customize learning environments to meet the needs of diverse student populations, while providing both high quality and cost-effective learning. (p. 27)

A lack of congruence between this definition and CS 271 is evident. Only students registered for credit at Stanford had a reasonable opportunity to interact with Thrun or Norvig. Students in both the Stanford course and the online mirror had a means to interact with one another, though those in person had a greater array of opportunities, while those online were provided message boards, a communication technology found to have little benefit in a student's learning (Michael Morris & Stommel, 2013). The flexibility in the system was only found for Stanford students, who could utilize the online mirror for lectures yet still access Thrun or Norvig for feedback, while online students received feedback through automated grading, and the hope of a teaching assistant replying to a post on the message board. Along these defined criteria, the methodology of CS 271 does not lend itself to the distributed learning model.

There is another etymological use of the phrase *distributed learning*, one from the machine learning and artificial intelligence field where Thrun and other MOOC developers began their professional lives. Within computer science, distributed learning is an intersection of

multi-agent artificial intelligence and machine learning (Friedrich, Kaiser, Rogalla, & Dillman, 1997). In a distributed learning algorithm, each agent, or AI, is dedicated to a specific aspect of the many tasks provided to the network, in an effort to increase the network's processing speed as well as the collective knowledge of the agent group (Dowell, Stephens, & Bonnell, 1998). In order for a network of computers to learn a process, they must mine a great deal of information in order to make generalizations and inferences associated with human cognitive learning (Thrun, 1996). Distributed learning algorithms attempt to teach the network through a smaller quality of data points while gaining the information necessary to complete future complex tasks.

Utilizing the artificial intelligence definition of distributed learning rather than the educational one, the MOOC is not a composite of pedagogical tools, social networks and content-delivery systems, but rather a data-driven learning environment design based on scalability. Scale is one of the attributes often quoted by MOOC developers who discuss it as an opportunity to lesson a student's debt load (Thrun, 2012). The idea of scale in a distributed learning algorithm is different than in a distributed learning environment for human subjects. In an artificial intelligence learning model, the objective of the algorithm is to get more networked agents to learn from fewer data points. By moving the AI model to a human platform, more students view the same content from an abstracted perspective (Watters, 2012). Thus, the learning environment becomes homogenized, which has led some researchers to question the MOOC in cultural and colonial terms (Daniel, 2012), seeing the current fervor based upon the notion of a celebrity instructor passing information out to a grateful public.

What Makes Best Instructors? One of the early talking points for MOOC developers and supporters has been the notion that MOOCs inherently provide the highest quality instruction available in higher education. Authors such as Brooks (2012), Friedman (2012;

2013a; 2013b), and Zhu (2012) contend that MOOCs not only are an agent of globalizing and democratizing education, but do so with the best professors on the planet. Similar statements concerning best teachers were made by MOOC developers Thrun (2012), Koller (2012) and Ng (2013). However, none of these writers or developers offers a rationale for their argument, or even an instrument to measure teaching effectiveness.

Part of the problem in developing an instrument to measure instructional effectiveness is the difference in teaching at a primary level versus higher education. While teaching in primary schools or at Universities involves more than an in-classroom experience, the immediate requirements for a primary school teacher revolve around measuring a student's learning outcomes. There has been a recent call to research to determine what constitutes primary school teacher effectiveness, with varying results achieved: some research (Braun, 2005) finds correlation with testing, observation and student evaluations; while other research (Biesta, 2009) directly links quality student-teacher and even student-student interactions as paramount. This difference in the narrative supports an argument by Shaw (2012) that quality teaching is measured by some groups through calculation and measured by other groups as care.

Defining quality, or *best* within higher education becomes more difficult due to the extenuating expectations and requirements for a professor. Whereas defining a good primary teacher relies heavily on in-classroom outcomes, a professor is often measured along a greater number of strata including classroom instruction, service to the collegiate community, and discipline-based scholarship. Tenure, the quality assurance instrument utilized by universities, requires a strong mixture of these three elements: positive outcomes for students in collegiate courses (measured in part through student evaluations), a dedication to supporting and fostering community at the institution, and both a quantity and quality of scholarly research in the

professor's field. Moreover, every institution utilizes their own internal criteria to determine whether a professor's fitness for tenure; a liberal arts college would focus more heavily on the in-classroom experience (Occidental College Faculty Packet, 2005) than a research university (California State University Faculty Affairs, 2002).

When writers and developers speak about best professors, inherent in the statement is a focus on professorial ability in regards to instruction:

> We demand that plumbers and kindergarten teachers be certified to do what they do, but there is no requirement that college professors know how to teach…The world of MOOCs is creating a competition that will force every professor to improve his or her pedagogy or face an online competitor. (Friedman, 2013b, para. 8)

From this perspective, the ability for a professor to engage a student with content and deliver an applicable learning outcome is the most important characteristic in defining a best professor. However, in the existing literature there is no pedagogical rationale involved in determining the professors who will teach MOOCs; rather, professors volunteer to teach MOOCs (Knox et al., 2012). Moreover, a professor who wishes to teach a MOOC through a platform such as Coursera must work at an elite university, as Coursera restricts membership to elite schools as defined by membership in the American Association of Universities, consideration as a Top-Five university outside of America, or receive an exemption by Coursera's board of directors (Rivard, 2013b).

A problem with limiting membership to these elite universities is the manner in which elite universities view a professor's responsibilities as an instructor. At an elite university, scholarship is viewed as important, if not more important, than classroom instruction. Professors are thus required to dedicate a strong percentage of their time to research, publishing and speaking (Ali, Young, & Ali 1996). This is not the case at many non-elite universities, where

research and publication are still expected but not equal to the role of instructor. To that end, the 2012 Center for College Affordability & Productivity only includes one MOOC-affiliated school in its Top 25 list of Institutions with the Best Professors. Most of the schools listed are small, liberal-arts campuses with a dedication to small class sizes and contextual learning environments (Center for College Affordability & Productivity, 2013).

One potential reason elite universities do not make the list of institutions with the best professors is perhaps due to the rising number of graduate students or adjunct teachers leading instruction in those classroom. The use of adjunct professors at colleges and universities has increased dramatically over the past 30 years; while the number of tenure-track positions has increased by 7% over that time, the number of adjunct positions has increased by 210% (Parker, 2011). According to a report by the American Association of University Professors, in 2012 nearly 75% of all higher education teaching positions in America were filled by adjunct teachers (Basu, 2012). At Harvard, 57% of faculty in 2005 were adjunct, a number that increases to 67% when including graduate students leading classes (Parker, 2011). Unlike tenured or tenure-track professors, adjunct instructors are hired on either a semester or course basis, paid at a level markedly lower than tenure-based counterparts, and rarely have employment benefits in their packages (Basu, 2012). The lack of office space, research assistance, office hours, benefits and equal pay have made adjunct teachers second-class citizens at their institutions, despite being responsible for the majority of educational opportunities for the students (Berry, 2005).

Lost in that syllogism is what makes an instructor elite: a strong understanding of how pedagogical practices influence a student's ability to contextualize content, or what Vaidhyanathan calls "an extension of a celebrity academic" (2012b, para. 14). Existing literature on the experiences professors have in teaching MOOCs not only shows a population engaging

educational theory and pedagogy for the first time, but celebrating this newfound engagement. In the article *Learning from MOOCs*, Coursera co-founder and MOOC instructor Andrew Ng (2013) quotes Princeton professor Richard Adelman on the challenges in teaching through the MOOC platform:

> When I lectured, I had to ask myself at all times 'What is it that I want my students to learn?' In the old-fashioned lecture hall I was an entertainer, more self-focused rather than teaching-focused, but I was not conscious of this dynamic until I put a course online for the first time. (para. 6)

Rivard (2013a), writing about a MOOC summit hosted by MIT and Harvard, quotes a conversation with edX President Anant Agarwal regarding how MOOC instructors are viewing pedagogy for the first time:

> EdX President Anant Agarwal said there is certain learning sciences research that many faculty, including himself, had long ignored as they focused on their own disciplinary fields.
>
> "To me, these papers should be must-reads," he said, citing specifically a 1972 study of memory.
>
> Agarwal said that paper was among the research about learning he had not read until recently. He said he thought other faculty were generally unfamiliar with such research. (para. 7)

Khan goes a step further, discounting education research because it takes what he calls the art out of teaching (as quoted in Noschese, 2011):

> I think it's nice to look at some of the research, but I don't think we would… and I think in general, people would be doing a disservice if they trump what one research study does

> and there's a million variables there: who was the instructor, what were they teaching, what was the form factor, how did they use to produce it? You'd be doing yourself a disservice if you just take the apparent conclusions from a research study and try to blanket them onto what is really more of an art. (para. 3)

While some developers acknowledge a general awakening in higher education regarding pedagogical practices (Ng, 2013), the celebration of heretofore theoretical and pedagogical ignorance is not supportive of the best professors ideal. Nor is a citation of cognitive learning studies from over 40 years ago, when professors at other non-elite universities engage not only in more contemporary learning theories (Michael Morris & Stommel, 2013), but are an active part of the scholarship (Davidson, 2013).

One constant for the coinage of best professors is the connection to best institutions and the benefits of university affiliation. MOOCs are promoted as courses offered by elite universities (Friedman, 2013a; Tabarrok, 2012); therefore, the instructors must also be elite. While this literature review has pinpointed discrepancies in the best professor argument, MOOCs are a new phenomenon, and scant research exists on it and its many extensions. However, existing institutional policy for MOOC providers keeps the MOOC as a platform for the facilitation of elite university courses, limiting the pool of professors with the opportunity to design and instruct a MOOC. So while Friedman (2013b) believes MOOC professors are in a free-market pedagogical battle for relevance, the playing field is skewed to their institutions and their tenures, ensuring or at least assisting their continued status as best professors.

Accountability in a MOOC. Inherent in the political efforts to reform primary and secondary education is an emphasis on accountability measurements practices. Measuring the outcomes of students through various means, most notably standardized testing, is considered not

only important in regards to measuring the student, but also in measuring the effectiveness of the teacher (Bennett & Wilezol, 2013). Political forces consider such accountability is important to providing another arm to track student progress, as well as identify and promote excellence from the part of the instructor. While such practices are controversial, an increasing number of local policies are advocating for the movement. Under such a scenario, accountability for student outcomes is held by a number of stakeholders, but the results of standardized testing affects classroom teachers the most.

Higher education has traditionally measured student outcomes accountability through student reviews of professor performance. Reviews are considered important by universities, as they make up a percentage of the data to determine whether a professor has received tenure. Student reviews show not only the quality of a curriculum, but whether a professor has engaged her students, provided assistance to work through obstacles, connected the course to ideas outside the discipline, and assigned projects that benefitted the student in utilizing the information (Giroux, 2008).

The strata for which a professor is rated at a university cannot be transferred seamlessly to a MOOC, as many of the expectations of a professor, as listed on a student survey, are not fulfilled by a professor in a MOOC. In a MOOC, professors determine the content and perhaps share it through video lectures, but the course cartridge is digitally designed by a different individual, and professors rarely answer questions from students on discussion boards. Grading is automated or provided by peers, and scaffolding is outsourced to those groups or individuals outside the course, leaving the student to create it on his own. If the educational outcomes of a MOOC are low, how can a professor shoulder the responsibility, as the development of the course has touched numerous individuals? This creates a scenario of plausible deniability, where

the MOOC is beyond reproach, and criticisms of student learning are addressed by an element of the system, such as customer service, that deals exclusive from the educational parameters and entirely with complaints. In this reality, the MOOC can never be blamed for the loss of outcomes, as blame cannot be shouldered by only one element of the program.

Already, elements of plausible deniability have crept into MOOC discourse. As faculty from a number of schools have criticized the imperial nature of MOOC cartridges from elite universities, a number of MOOC professors have stated that they cannot be blamed for how their course is used; its use is determined by each specific administration, not the creator (Kolowich, 2013b). This argument abstracts the MOOC from its environment and only addresses the short-term ramifications of what the MOOC phenomenon represents (San Jose State University Philosophy Department, 2013).

MOOC as neoliberal educational extension. One question largely ignored in existing MOOC scholarship regards parties and organizations that benefit from the proliferation of MOOCs in higher education. The dominant ideology presumes benefit is evenly spread among stakeholders: students, who receive quality instruction at either no cost or a low cost; institutions, who can reach more students at a lower cost threshold; governments, who can see more students affected through the same financial backing; and MOOC organizations, who provide a service in the free market and receive compensation based on their abilities. To presume this requires believing MOOCs provide as high of a quality educational experience as existing higher education models, and funds currently maintaining the higher education system would be better utilized if reallocated to emerging stakeholders such as MOOC organizers.

While San Jose State University points to internal research showing an increase in course retention and success since adopting MOOC-based curricular materials and MOOC courses

(Cheal, 2013), the manner in which said courses operated is in stark contrast to the free offerings most associated with MOOCs: course enrollments were capped, students enrolled in the SJSU-affiliated courses had access to school-sponsored professionals, and students in the for-pay version did not have interaction with students in the free version (Cheal, 2013). In this instance, students who had previously gained admittance to the California State University system and had the financial means to pay a tuition rate received a course experience modeled more closely to contemporary pedagogical trends: smaller class size, scaffolding, accessible experts and a communication apparatus not bogged down by a massive number of respondents, a common issue in MOOC discussion boards (Jacobs, 2013). Offering course variations based on economics does not harken to democratizing education but rather casts education as a market for price discrimination (Krugell, 2013), where premium services are offered based on the price a user can pay, potentially creating an educational spectrum beginning with free massive online courses and moving to tuition-based inclusive face to face or blended courses.

MOOC proponents argue that the learning model offers a high-quality service to a market without prior access (Friedman 2013a; RevolutiOnline.edu, 2013), negating a price discrimination argument. This argument puts a premium on the *elite* label of MOOC-affiliated institutions, positioning the organizations as being of the highest quality and facilitated by the best professors. In trying to create an elite global community as well as an individualized world for the user, the MOOC in fact creates a simulacrum:

> The promise of being at the center of the universe turns out to be empty – there is no such place…the language of "top universities," "world class education" and the "best professors" hardly conceals an assumed claim superiority of knowledge and a model of education ready for export without concern for cultural boundary distortions. But context

> and educational purpose matter in defining what constitutes knowledge. (Portmess, 2013, pg. 3)

The contrasts between a contextualized education in a situated environment (traditional college), a somewhat abstracted education in a somewhat situated environment (partnerships between universities and MOOCs) and an abstracted education in a sterilized environment (MOOCs) have largely been ignored in existing MOOC discussion to a focus on educational access. Existing distance and online education scholarship research shows the efficacy of economically sensitive, contextualized educational experiences in situated digital environments (Garrison, 2009). By promising everything to everyone, the MOOC can find and herald educational success on various strata without being successful at any of them.

Perhaps educational success is not the primary motivation of MOOC providers. In a neoliberal economy, goods and services subsidized heavily or provided by the government are instead partitioned to private providers, either completely or through public-private partnerships. With government funding for education dwindling, governments have turned to various third-party services for general provision. Funding previously provided to public institutions through the government has been instead channeled to private organizations (such as for-profit institutions and charter schools), policy oppositional to research showing the best per-dollar benefit in education coming when the dollar is more closely aligned to the individual (Hoxby, 2008). While most MOOCs do not receive direct government subsidy as of this writing, MOOCs have received research money from the state level (State of California, 2013), and state and federal political energies are engaged in rethinking higher education accreditation in order to allow these providers an opportunity for government money (United States Government, 2013). This would provide a revenue stream for organizations that until now have depended on private

investment through Venture Capital, organizations that expect to see a return on their original seed investment (Veletsianos, 2013a).

Consolidation of university power. As more universities follow the San Jose State model of outsourcing curriculum, materials and/or course infrastructure to MOOC providers (Wassell, 2013), what becomes of the thousands of colleges and universities across America producing curriculum and materials to serve students of their campus community, moreover the tens of thousands throughout the world? Skepticism of the MOOC's potential to alter higher education looks primarily at the educational output (Stewart, 2013), but such skepticism does not take into account the organizational and political initiatives that shape the system (Veletsianos, 2013a). It is those political and organizational movements that help Sebastian Thrun envision a world where there will only be need for 10 universities, made up of top professors who become actor-producers for the production of higher education (Leckart, 2012). Such projections likely overestimate the MOOC and underestimate the existing system, but economists and cultural critics have advocated for contraction of higher education institutions for decades, despite a steady growth in college enrollment. Economic MOOC advocates point to the MOOC as a potential ally in providing education to this mass of consumers while consolidating the existing system.

MOOCs already designate access, and subsequently the creation of content (Portmess, 2013), to their platforms based on institutional status, with faculty of those institutions gaining the opportunity to produce a MOOC. This is not unique to the history of education; Peters (1983) believed the advent of industrialized learning materials and processes in distance education would allow for a consolidation of the "academic middle tier" (p. 113) of schools, their efforts now undertaken by elite schools providing this revolutionary education. The faculty

of the academic middle tier would then be relegated to organizing and assessing learning materials for a grade, a work level below the standards and abilities of many professors, as Peters (1983) notes.

The purpose of higher education is not limited to the accrual of knowledge, nor is the purpose of faculty limited to reciting knowledge to the student mass. As noted earlier, students learn best when engaged in a contextual environment and surrounded by peers and mentors (Papert, 1993). By consolidating the academic middle tier, the MOOC system as envisioned by Peters and Thrun would replace learning environments home to the best professors (Center for College Affordability and Productivity, 2013) with sterile, ahistorical environments of content accrual. Highly motivated, self-initiating autodidacts may benefit from such a model (Watters, 2013a), but students who make up the population at the existing academic middle tier will be subject to a learning environment that, as of this writing, shows no recognition of multiculturalism or supportive learner needs (Stewart, 2013), much less addressing disabilities existing colleges must account for via the Americans with Disabilities Act.

For faculty, a loss of the academic middle tier could mean a loss of their status as professionals (Rees, 2013b). Pedagogues teaching at liberal arts colleges, researchers at state universities, and networking practitioners helping students at junior and community colleges would be realigned to singular purposes at elite institutions, if kept at all in the new system (Meyer, 2013). This would impact both the breadth of existing academic research as well as its quality, as many institutions labeled as elite have partnered with private interests in developing future research initiatives (Schindler, 2007), as well as pedagogical growth, considering teachers who score the highest in research-based assessments are largely affiliated with non-elite schools (Center for College Affordability and Productivity, 2013).

Perhaps the greatest detriment in the consolidation of university power is the affect on local communities. Not only do colleges provide education opportunities for students and jobs for adults, they also create an ecosystem of discovery and community through artistic production, environmental beautification, and service initiatives to assist the community. Colleges have long been shown to benefit individuals outside their admission system through talks and colloquia, special events, and community gatherings. While MOOC providers argue their service can more than adequately replace the learning objectives of students while providing economic relief, there has been no discussion of how they will account for the consolidation of community.

Is education still a public good? The zealous adoption of the MOOC in the mass media, not to mention many academic administrations and political capitals, focuses primarily on user-end outcomes for education: content learned and cost accrued. This focus on the student, or *user* (Ferenstein, 2013), can be viewed in tandem with other policy-backed educational initiatives of the past thirty years: voucher systems, charter schools, and efforts to personalize learning through computer-aided instruction. With dwindling governmental resources being split across traditional education structures and these more recent developments, is education still considered a public good?

Over the past 20 years, technological advances geared toward ubiquitous computing have led economists and researchers to view the institution of education in a state of structural transformation (Garber, 1996, Munitz, 2000), the transformation a commercial one allowing technology-based competition to enter the education marketplace. These arguments, according to Pusser (2002, 2006), cast transformation not only as inevitable but as a right based on our system of governance. Change is not inevitable, however, but a narrative based on ahistoricism,

casting the existing structure as problematic and the potential solution as omnibenevolent. While privatized structural transformations align themselves with market-driven terminology such as *personalized learning* and *school choice*, "contemporary research [does not] sufficiently explore the relative inability of market-based, consumer-driven system to produce opportunities for universal access, leadership training, or the redress of social inequalities" (Pusser, 2002, p. 106).

The lack of historical perspective, theoretical foundation and pedagogical research that defined the emergence of the MOOC phenomenon is not a happy accident, but rather indicative of a longstanding trend in how private enterprise reorganizes and restructures education. Whether the trend toward company-based educational modules is inevitable or ahistorical, its presence as a dominant force in discussions on the future of higher education call into question the continued history of education as a public good.

Summary

Reviewing the history of the MOOC through noting its historical, educational, cultural and political predecessors both illuminates and clouds the defining characteristics of the phenomenon. Through the guise of the dominant cultural ideology on education, the MOOC is a logical step forward in education and educational technology, allowing the global marketplace access to quality content from vetted education authorities. From this vantage point, the MOOC not only utilizes technology to provide personalized learning experiences for students, but can reflexively analyze the data points generated by student and content interactions and find the places where existing learning materials fail. The result is a learning model that can and already is revolutionizing the system, creating a better learning situation than the status quo. Dissent on the topic sees the MOOC as a step backward in educational theory and pedagogy, where technology is implemented not to revolutionize learning but to mirror the existing practices,

practices MOOC advocates bemoan as outdated but which allow for profitable scalability of materials and resources. From this lens, such maneuvers establish an imperialist hierarchy of content providers and institutional brands, at the same time undercutting the societal ideal that education is a public good.

Despite the debate as to the lineage of the MOOC along such terms, the phenomenon has captured the attention of educators, innovators, entrepreneurs and politicians alike, in a manner heretofore unseen in the history of higher education. While pundits continue to espouse the idyllic nature of the MOOC and detractors set to question its practices in the guise of egalitarian hype, the effect of MOOCs has already been felt by institutions and governments, resulting in political and entrepreneurial maneuvers to restructure the manner in which students are assessed for a collegiate degree. This unprecedented movement has largely occurred prior to substantial published research on the learning model.

Chapter 3: Methodology

This chapter presents a rationale for undertaking a Delphi study to research the evolution and impact of massive open online courses, as well as the methodology and procedures of the study. The purpose of this Delphi study is to understand the present impact of MOOCs on the social structure of higher education, and consider the potential future outcomes for the institution.

Statement of Research Questions

This study is directed by two primary research questions:

1. To what extent can experts in the MOOC phenomenon agree about its likely impact on higher education? Where do their opinions differ?
2. To what extent can experts in the MOOC phenomenon agree about its role in the historical, social and cultural shaping of higher education? Where do their opinions differ?

Research Design & Methodology

The research protocol utilized for this study is the Delphi method, a research design created to provide a space for field experts to discuss issues involving a central topic and to spur feedback from one another, forecasting potential outcomes and in some cases reaching consensus, through a controlled feedback loop (Linstone & Turoff, 2002). As noted earlier, the original Delphi study was developed by the RAND Corporation for the United States Air Force to encourage open discussion about a pressing potential issue the institution saw (Linstone & Turoff, 2002). Since then, Delphi research has been regularly used by researchers and practitioners to coalesce experts around a topic in an effort to forecast potential futures or find consensus on a potential course of action (Martino, 1993).

The Delphi method of research is widely used in studies involving recent phenomena where the defining characteristics of the phenomenon have yet to be solidified, and through instrument iterations a group can find consensus on terminology, definitions and the potential outcomes of the phenomenon (Skulmoski, Harman, & Krahn, 2007). In a Delphi study, the chosen experts respond to prompts provided by a researcher, who then compiles the information and returns it to the experts as part of a new iteration. Over the course of several questionnaires, experts are asked to not only take a stand on issues within the field but to also provide rationale for the stand, and to defend those statements or create new knowledge based on the responses of other experts (Keeney, Hasson, & McKenna, 2006).

Essential to the design of a Delphi research study are the following considerations, according to Linstone & Turoff (2002):

1. The problem does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis
2. The individuals needed to contribute to the examination of a broad or complex problem have no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise
3. More individuals are needed than can effectively interact in a face-to-face exchange
4. Time and cost make frequent group meetings infeasible
5. The efficiency of face-to-face meetings can be increased by a supplemental group communication process
6. Disagreements among individuals are so severe or politically unpalatable that the communication process must be referee and/or anonymity assured

7. The heterogeneity of the participants must be preserved to assure validity of the results, i.e., avoidance of domination by quantity or by strength of personality (bandwagon effect). (p. 4)

The Delphi research methodology is an ideal instrument for the MOOC topic for a number of reasons, most notably the relative newness of the phenomenon. The MOOC is a recent learning model with a limited body of scholarly research, and Delphi studies provide an opportunity for experts to gain consensus on existing issues within phenomena that have yet to be adequately defined through research (Skulmoski, Harman, & Krahn, 2007). The Delphi study provides an exploratory research technique utilizing diverse expertise in the goal of forecasting futures or developing a present consensus (Wissema, 1982). This makes the Delphi method unique from a survey provided to a larger sample size, as the survey is a research instrument that assumes existing dominant knowledge and attitudes within the field (Creswell, 2008). Delphi is also an ideal methodology when practitioners and decision-makers are interested not only in the opinions of experts, but in seeing those opinions explored through a rigorous scientific instrument, with the potential for consensus, unexpected attitudes or future solutions to appear (Wilson & Moffat, 2010). Through controlled feedback, experts have the opportunity to share ideas and form consensus based not only on their philosophy and worldview but that of the panel through an iterative process, whereas a survey limits respondents to one round of answers and lacks ability to engage experts in furthering their answers and the research questions, as well as negating a consensus or problem-solving.

This particular research study modified the traditional Delphi technique along several parameters. Most notably, this research utilized asynchronous communication technologies for expert discussion rather than the original face-to-face setting of a Delphi study. The majority of

Delphi studies today utilize asynchronous communication for several reasons: it allows a greater pool of experts by removing time and geographic boundaries (Creswell, 2008) and it protects the research from subjective biases possible in face-to-face interaction (Adler & Ziglio, 1996).

One proven benefit of the Delphi study is the promotion of asynchronous communications between expert and researcher (Martino, 1993). As a Delphi study involves multiple discussion iterations, the freedom of correspondence at the leisure of the expert makes it likely for expert engagement throughout the research study (Creswell, 2008). The benefit of participant confidentiality is vital as well; asynchronous communication allows all members to speak in the discussion without subjective measures like personality or professional prestige to color the research, and the controlled feedback provided by the researcher in further iterations keeps discussion focused on the research purpose and questions (Martino, 1993).

Reliability and Validity of Methodology

Despite the strengths of the Delphi methodology in terms of expertise, confidentiality and the building of consensus, the technique carries the potential for disadvantages. In order for a Delphi study to be a sound research instrument, these potential pitfalls must be acknowledged as part of the research design.

General criticisms of the Delphi method include the potential for weak consensus and opinions (Sackman, 1975), a concern for finding consensus where none may register (Lang, 1998), and a potential for experts to promote an agenda in lieu of developing ideas through a shared space (Nambisan, Agarwal, & Tanniru, 1999).

Specific to the topic of MOOCs, a focus on consensus may be a reach for the research due to the notable differences between the goals and methodologies of MOOC providers (Rivard, 2013a ; Siemens, 2012). Moreover, MOOC instructors stand to benefit from the success of

MOOC as a learning instrument, and their responses to a research instrument may endeavor to support the system (Kolowich, 2013b).

According to Creswell (2008), Delphi research must implement safeguards to ensure accuracy of the study. Creswell suggests researchers employ means of triangulation, member checking and/or external audit to embolden the study. In triangulation, the researcher verifies the accuracy of claims made both in the literature review as well as by the experts in the study. Member checking involves asking experts within the Delphi study to ensure the validity of the instrument as it pertains to contemporary research, as well as to look over data for inaccuracies. However, Linstone and Turoff (2002) state that the Delphi in and of itself is a methodology of member checking, with the iterative process a methodology to check accuracy. Researchers can also choose external audit, where experts outside the Delphi study employ the same means and measures as done in member checking.

Sampling Procedure

Vital to the success of a Delphi study is the methodology concerning the collection of experts involved in the discussion (Lang, 1998). Both the success of the Delphi discussion as well as the rigor of the research depends highly on the successful identification and utilization of participants. For a Delphi study, a sample of random participants is not ideal, and rather the researcher should develop a rigorous procedure for identifying and culling experts for a study. Once such a protocol is in place, the researcher solicits experts as participants.

There is no existing instrument to define expertise in the field of MOOCs. As noted in Chapter 2, this subset of educational technology is a new field within education, made up of software developers, philanthropists, venture capitalists, theorists, politicians and educators. To that end, few MOOC stakeholders have backgrounds in educational scholarship, theory or

pedagogy. However, as McLaren (1998) noted, whether an agent of change has a background in educational pedagogy makes little difference as to whether the agent will change the system; rather, a position of power within the infrastructure provides the greatest avenue to affect the system. The MOOC is not just a learning management system but a sociocultural phenomenon transcending the institution of education, and its stakeholders come from wide and varied fields of primary expertise.

As characterized in Chapter 2, a MOOC is an educational offering in alignment with a higher education institution requiring either explicit or implicit prior knowledge, as well as offering a space for two-way communication between student-teacher or student-student. These characteristics distinguish MOOCs from educational technology platforms such as Khan Academy, 10gen and Code Academy, which share attributes with MOOCs but either lack a focal instructor or facilitator, designated communication opportunities, alignment with existing higher education institutions, or a combination of the three.

The rapid growth and subsequent evolving nature of the MOOC as a definable learning model hampers the creation of an instrument to establish expertise. Some of the eminent educational thinkers discussing MOOCs come from fields congruent to the MOOC, such as distance education or educational technology, with dozens of years' experience in the field (Andersen, 2013; Daniel, 2012), while others come from disciplines more recently connected to education, such as computer science or business, and have gained their expertise in a matter of months of practical experience developing and implementing the platforms (Cheal, 2013; Ng, 2013).

However, through the lens of critical theory, a number of disciplines hold professionals viewed as experts on the MOOC: system developers, practitioners, researchers, government

officers and critics. Expertise is a term definable through direct experience, indirect experience, or even power (Alvesson & Deetz, 2006). Utilizing critical theory as a lens, experience is not the only definition of expertise, but rather position and subsequent power can provide expertise as seen in the public sphere (Habermas, 1991). Due to the relative newness of the MOOC, expertise is not easily defined by experience; also, due to the considerable attention MOOCs have received, the role of critic or societal expert has proven instrumental in shaping the dominant ideology behind the MOOC as well as subversive contentions.

Expertise as defined by activity with the MOOC was determined both by experience and awareness/recognition within media and culture. Experience was defined by active engagement with the development of a MOOC platform or service provider, instruction or facilitation of a MOOC, a role in developing institutional or public policy involving the MOOC, or a base of research in the fields of educational technology, distance education or online learning. Awareness and recognition within media and culture was instrumental in choosing cultural critics and journalists for the panel. Rather than defining expertise quantitatively through metric-based analysis of years' experience or publications, the researcher focused on the social aspects of power and prestige in defining expertise, choosing to note the proliferation of citations in media articles, appearances in media outlets regarding MOOCs, social media awareness, or research-based citations.

This study utilizes outside data in order to determine expertise by cultural critics on the subject of MOOCs and sociocultural outcomes. Critical theory contends that dominant ideologies shape our societal structures and services (McLaren, 1998); therefore, expertise is defined through the shaping of both the structures themselves and the narrative shared through the public sphere. At the same time, this research does not forget the importance of subversive

ideologies in challenging the dominant paradigm and resisting hegemonic assumptions the dominant ideology provides as truths. In order to produce a valid instrument to select diverse experts on the topic, the researcher consulted various media outlets validated as important to education, technology, educational technology, and the world at large.

It should also be noted that the determination of cultural critics cannot be completely determined by scientific means such as website hits or receipt of awards. Validation of a cultural critic was determined by numerous factors: existence in various subsets of MOOC discussion through hyperlinks and citations, discipline-based awards and accolades awarded to the critic such as conference keynotes, as well as engagement in the public sphere of the culture or subculture.

Research of Delphi studies indicates the ideal number of participants in a sample as between 15 and 20 (Linstone & Turoff, 2002). This provides a group large enough for the researcher to gather and analyze a large sample of data while small enough to not overwhelm participants with information in subsequent iterations (Martino, 1993). In a field of limited expertise such as the recent MOOC phenomenon, such a sample size not only provides the benefits of smaller group communication, but also incorporates a noteworthy percentage of existing MOOC experts.

The researcher split the Delphi experts across five disciplines: developer of a MOOC platform or provider, instructor or facilitator of more than one MOOC, scholar with extensive background in technology and learning, institutional or government official active in developing MOOC-related policy, and noteworthy cultural critic discussing MOOCs. Experts were contacted through personal solicitation, either through existing relationships between the researcher and the expert, or relationships between committee members and the expert

(Appendix A). Regarding instructors and facilitators, the researcher chose to mirror the existing breakdown of MOOC disciplines by soliciting more instructors of computer science or STEM subjects rather than those in professional subjects or the humanities.

Expert Participants in the Delphi Study

For the purpose of securing a well-represented panel of experts for the Delphi study, the researcher secured active and distinct voices associated with the MOOC discussion. Because the MOOC is a recent phenomenon, the expertise of voices was judged on a number of tangential criteria: established practice or scholarship in their specific field, relevant and substantial association with MOOCs, and a willingness to engage with stakeholders from various disciplines and perspectives. The 20 individuals who participated in the research study were:

MOOC developers. *Maria Andersen* – Director of Learning and Instruction at Area9. Prior to her work with Area9, Dr. Andersen was the Director of Learning and Research at Canvas, the education start-up that produced learning management system Canvas. Dr. Andersen's contributions to the MOOC field include her work at Canvas and a series of keynote workshops entitled, *Teach a MOOC…what, are you crazy?* (Andersen, 2013).

Peter Norvig – Udacity professor and Director of Research at Google. Dr. Norvig co-taught CS 271, considered one of the prototypical MOOCs in mainstream discussion (Lewin, 2012) with Sebastian Thrun at Stanford University, and is a co-professor for several Udacity courses. He is also co-author of *Artificial Intelligence: A Modern Approach*, the leading textbook in the field of Artificial Intelligence (citeseer, 2013).

George Siemens – educational theorist and researcher at the TERKL Institute at Athabasca University (Canada). Dr. Siemens' is credited with creating the course that helped coin the term MOOC; his learning theory of connectivism was the catalyst for CCK08, a course

taught both at the University of Manitoba and online without charge to interested parties. He has worked in distance education and research for the better part of two decades.

Dennis Yang – President and COO of Udemy, a MOOC provider focused primarily on business and corporate training courses. Mr. Yang has worked for nearly two decades in the tech industry of Silicon Valley, including as the Senior Vice President of 4INFO, a mobile advertising company.

MOOC instructors/facilitators. *John Owens* – Associate Professor of Electrical and Computer Engineering at University of California, Davis. Along with his work at UC-Davis, Dr. Owens is a professor at Udacity, having offered the course *Introduction to Parallel Programming* since the Fall of 2012. Dr. Owens has been interviewed by local and national press on his experiences as one of the earliest MOOC instructors.

Kurt Squire – Assistant Professor of Educational Communications and Technology at the University of Wisconsin – Madison. At the time of the Delphi iterations, Dr. Squire was one of the professors teaching *Video Games & Learning*, a MOOC on the Coursera platform. Dr. Squire has published numerous articles on the intersection of technology and learning, many involving the role of interactivity through models such as video games.

Kevin Werbach – Professor of Business at the University of Pennsylvania's Wharton Business School. As of writing, Dr. Werbach had taught three iterations of the MOOC *Gamification* through MOOC provider Coursera. Dr. Werbach has also been interviewed in local and national media on MOOCs, and written several articles for higher education publications regarding the MOOC phenomenon.

Fatimah Wirth - Instructional designer at the Georgia Institute of Technology & MOOC instructor on Coursera platform. Dr. Wirth has designed and implemented professional

development courses in technology for partners of Georgia Tech as well as NASA. She was the lead instructor for Coursera's Spring 2013 course *Fundamentals of Online Education: Planning and Application*, a course that was suspended in the middle of its run due to issues with the learning management system (Jaschik, 2013).

Distance and/or online education experts. *Terry Anderson* – Professor of Distance Education at Athabasca University. Dr. Anderson has published numerous scholarly books and papers on distance education, including recent MOOC research (Weller & Anderson, 2013). Anderson is also the developer of the interaction equivalency theorem, a postulate weighing the importance of student interaction choices (other students, professors, content) depending on instructional design (Anderson, 2003).

Tony Bates – President of Tony Bates Ltd., a consulting service specializing in e-learning and distance education solutions. A pioneer in distance education research, Dr. Bates has published 11 books and numerous scholarly articles on e-learning and distance education, including some of the earliest scholarly work on the recent MOOC phenomenon (Bates, 2012).

Amy Collier – Director of Digital Learning Initiatives at Stanford University. Dr. Collier has worked as an administrator at various centers for teaching and learning for over a decade, focused on improving educational outcomes through research-tested strategies. Dr. Collier's current research includes the *distributed flip*, a practical model designed for reuse of open MOOC resources (Caulfield, Collier, & Halawa, 2013).

Valerie Irvine – Assistant Professor of Educational Psychology & Leadership Studies at the University of Victoria (Canada). Dr. Irvine's research and scholarship focus on educational technology and its integration and evaluation in higher education spaces. Dr. Irvine served as co-editor of the Journal of Online Learning and Teaching's 2013 special issues on MOOCs.

Policy voices. *Stacey Clawson* – Senior Program Officer for Next Generation Models in Postsecondary Success, Bill & Melinda Gates Foundation. Dr. Clawson has spent over a decade working with organizations and institutions shaping instructional support through the use of technology. Dr. Clawson is also on the steering committee for the MOOC Research Initiative.

Todd Edebohls – CEO of Inside Jobs. Prior to his work with Inside Jobs, Mr. Edebohls was the Director of Business Development of Amazon.com, as well as an Amazon technologies inventor. Mr. Edebohls was a co-author of the Online Learner's Bill of Rights, a December 2012 white paper written in response to MOOCs and other online learning initiatives.

Steve Filling – Professor of Accounting at California State University, Stanislaus. In addition to his work as a professor, Dr. Filling has served as the Speaker of the University's Academic Senate, as well as currently serving as the tenure-track representative for the California Faculty Association, a higher education teacher advocacy group in California currently debating topics impacting the relationship between universities and faculty, including MOOCs.

Cathy Sandeen – Vice-President for Education Attainment & Innovation at the American Council on Education. Dr. Sandeen has worked with ACE on initiatives to determine the accreditation status for various MOOC courses and platforms. She has spoken at conferences on the role of MOOCs in the existing higher education landscape, and recently published the white paper *From Hype to Nuanced Promise: American Higher Education and the MOOC 3.0 Era*.

Cultural critics. *Anya Kamenetz* – Senior Writer, *Fast Company* magazine. Mrs. Kamenetz is an author and public speaker focused on how learning and technology affect millennials as well as the new millennium. Her books on educational technology and disruption

include *Generation Debt* and *DIY U: Edupunks, Entrepreneurs and the Coming Transformation of Higher Education.*

Sean Michael Morris – President and Editor, *Hybrid Pedagogy*. A part-time faculty member at Marylhurst University, Mr. Morris' scholarship focuses on pedagogical best practices. As the President & Editor of *Hybrid Pedagogy*, an online journal dedicated to pedagogy-based study, Mr. Morris co-facilitated MOOCMOOC, a weeklong MOOC in 2012 focused on defining and engaging the MOOC phenomenon. He also co-authored the Online Learner's Bill of Rights.

Clay Shirky – Author & Assistant Professor of New Media at New York University. Dr. Shirky has written two bestselling books on how the Internet affects society, *Cognitive Surplus* and *Here Comes Everybody*, and spoken at numerous conferences and festivals on the subject. His 2012 article *Napster, Udacity and the Academy* helped define and shape early critical response to the MOOC phenomenon (Moe, 2013).

Audrey Watters – Education Technology journalist and Founder, Hack Education. Mrs. Watters has written for publications such as *The Atlantic*, *Inside Higher Ed*, the NPR/KQED education blog *MindShift*, and *Edutopia*. She also blogs frequently on educational technology topics at *Hack Education*, and is publishing an educational technology book, *Learning Machines*, in 2014.

The sample of instructors skewed toward those who taught via the Coursera platform, which was representative of the state of MOOCs in the field. As of July 2013, over 2/3 of MOOCs as defined by CampusCentral.com were taught through the Coursera platform, with more than half the total number of MOOCs coming in a STEM-related field or relating their discipline to STEM, such as video games or gamification. The researcher determined that utilizing a sample based on the present reality of MOOCs would provide a more authentic study

of the future of higher education rather than to engineer a participant sample including a greater number of higher education disciplines and a greater swath of existing massified educational technology providers.

Upon affirmation of participation in the research, participants received an informed consent document (Appendix B), which they had the right to print out as evidence of participation in the study. Participants were also directed to a short video detailing the rationale for the study and the mechanics of the survey instrument (Appendix C).

Instrumentation & Data Collection

This study involved three rounds of questionnaire mailing, interaction, collection, coding and controlled feedback. The number of rounds in a Delphi study depends on the changes in discourse over the course of controlled feedback and subsequent consensus building over iterations; however, the majority of Delphi studies end after three or four rounds either due to the panel reaching consensus or the researcher noting the value of more rounds to be negligible (Creswell, 2008). The researcher made clear to experts that the Delphi would likely end after three rounds unless extraordinary circumstances necessitated further rounds, and the study did end after three rounds.

Prior to implementing the questionnaire, a pilot study of six individuals was conducted in order to validate the questionnaire's topicality and rigor, as well as the technical structure and instrument host site. Participants for the pilot were similar to the participants in the proposed study in terms of research background, knowledge of subject and experience with MOOC systems and courses. Those participants were: Mike Caulfield, Director of Networked and Blended Learning at Washington State University – Vancouver; Stephan Franciosi, English Foreign Language Researcher & Practitioner at Doshisha Women's College of Liberal Arts in

Kyoto, Japan; Christopher Freeman, Vice President of Knowledge & Learning Technologies at Education Corporation of America; Rod Gallagher, Education Consultant at VMware and Doctoral Candidate in Learning Technologies at Pepperdine University studying computer-mediated personalized learning environments; Amanda Schulze, Instructional Designer and Doctoral Candidate at Pepperdine University studying the effects of instructional design on MOOC outcomes; and Bonnie Stewart, educator, writer and Ph.D Candidate at the University of Prince Edward Island, studying the relationship between education and networked identities. Pilot participants utilized the survey instrument, responded to prompts, and provided constructive feedback on the instrument's mechanics.

Distribution and collection of questionnaires occurred Zoho (http://www.zoho.com), a website dedicated to hosting surveys and discussions of varying length and complexity, and a site used regularly for response-based research. Such a technology is ideal for Delphi research not only because of the ability for participants to engage the study at their convenience, but also because the management system allows easier protection of anonymity (Creswell, 2008).

Communication with participants occurred exclusively over email for the duration of the study. Specific questions regarding difficulties with the survey platform were handled on a case-by-case basis. General questions directed at the content within the instrument prompts and subsequent discussion were reflected back to the participant, the researcher noting that the purpose of a Delphi study is to engage discussion around a topic and the lens of the participant is paramount.

Upon securing the expert panel for the Delphi study, the first iteration of the survey instrument began on October 14, 2013. Each participant was sent a secure email with a link to the unique survey instrument, a username/password combination, and a link to introductory

materials on the purpose and design of the research study. Participants had 14 days to engage the instrument. After seven days, participants who had not responded to the instrument were sent a reminder notice for the instrument. After 10 days, participants who had not completed the instrument but who had expressed intention to do so through email correspondence were sent a final email reminder. At 10:00 PM PST on October 28, the first iteration of the survey instrument was closed.

During the iterative series of Delphi instruments, the identities of participants were only known to the researcher and not among the body of experts. Upon engagement of the instrument, all identities remained confidential. Experts were noted in the research coding by a number sequence, and the key linking the number sequence to the expert was stored on a separate, encrypted hard drive. Participants were made aware that any of their comments included in the controlled feedback would only be referred to as an expert.

The first round of study (Appendix D) consisted of a multiple-prompt questionnaire where experts read 12 separate statements on MOOCs paraphrased from existing literature, and were asked to respond with their opinion on the statement's validity and subsequent thoughts the statement produces. The use of open-ended prompts rather than direct questions both allows for participants to utilize their expertise in answering the question, as well as provide the researcher more potential topics for future iterations (Helmer, 1983). The fictionalized statements draw entirely from existing discourse on MOOCs found in popular writings, such as newspapers, technology periodicals and the weblogs of individuals known for their expertise in both education and technology. This delivery of existing discourse via a fictionalized paragraph was used for the survey instrument due to several factors: a paraphrase of existing literature in the limited canon of research has the potential to eliminate the notion of research bias in the study,

and the removal of the original author's cadence and style allows cultural and political focus to reside on the subject matter and not the speaker.

The survey instrument was prefaced with the following:

> In the next few sections you will encounter statements paraphrasing quotes from research papers, media articles, expert panels and conference presentations regarding the topic of MOOCs. Read the paraphrased quotation, and take a stand on the article of "strongly agree," "agree," "disagree" or "strongly disagree." Please provide commentary to develop your rationale for agreeing or disagreeing with the statement.

As per institutional protocol for creating an action indicating inclusion in the study, participants clicked a link to the survey instrument that read, "By clicking on the link to the questionnaire, I agree to participation in this research study."

The first four prompts cover the MOOC as a learning system, and the pedagogical and theoretical aspects of the system. The second four prompts involve measurement and institutional aspects of the MOOC, such as learning outcomes and institutional prestige. The last four prompts involve the relationship of the MOOC with cultural, societal and political norms and assumptions about education (Appendix D).

After collecting the data, coding and analyzing the information, the researcher implemented the second questionnaire. This questionnaire kept the 12 paraphrased prompts as the foundation of the instrument, but to spur discussion through controlled feedback also included a summary of the first round of responses, Likert results for each prompt, summaries of the answers and selected quotations from panel experts. Participants were asked to restate their feelings on the topic, reaffirm positions based on the responses of others and, if the case, how their viewpoint changed based on the panel's responses.

The second round opened on October 29, 2013 and ran for 14 days, closing on November 9, 2013. Emails were sent over a secure system on October 29 to all participants that included a link to the unique survey instrument, a username and password combination, and general statistics on expert participation. The email also included a notation for the one item of the instrument where consensus was achieved (see the section on what constitutes consensus). Mirroring the approach from Round 1, participants who had not responded to the instrument were sent a reminder email after seven days, and participants who had not completed the instrument but had expressed intent to do so through email correspondence were sent a final reminder after 10 days. At 10:00 PM PST on November 9, the second iteration of the survey instrument was closed.

Once responses were generated, the researcher again utilized the Likert scale to code the quantitative information, summarized attitudes captured in the second iteration through synopses of each prompt, and pinpointed specific quotations from study participants. This data was placed into the survey instrument for Round 3, replacing the similar data from Round 2.

The third round opened on November 10, 2013 and ran for 21 days. Emails were sent over a secure system on November 10 to those experts who had completed Round 2 of the instrument, the email including a link to the unique survey instrument, a username/password combination, and general statistics on expert participation. The email also included a notation for the three items of the instrument where consensus was achieved. The extension of the survey instrument by one week was a decision made in light of several experts expressing interest in continuing engagement with the Delphi study but running into time obstacles with the looming end of semester and holiday season. However, protocol for participant reminders remained unchanged: participants who had not responded to the instrument received a reminder after

seven days, and participants who had expressed interest in continuing but had not done so received a final reminder after 10 days. Emails sent by participants after 10 days were responded to, but no further unsolicited reminders were arranged. At 10:00pm PST on December 1, the final iteration of the survey instrument was closed.

On the fourth day of Round 3 of the Delphi study, MOOC corporation Udacity announced plans to shift its education business focus from higher education to business and professional development education (Chafkin, 2013). This pivot in mission gained a large amount of attention in education media and even national outlets, much of the discussion either chastising Udacity for its shift in light of previous democratic rhetoric (Siemens, 2013b; Watters, 2013b; Weller, 2013) or labeling the event as the beginning of the end of the MOOC phenomenon (Rees, 2013b; Schuman, 2013). Previous Delphi studies have noted that large-scale events within the phenomenon can impact discussion and results, sometimes significantly (Adler & Ziglio, 1996).

Participation Rate of Expert Panel

As a Delphi panel necessitates a robust slate of experts to discuss an emerging phenomenon through controlled feedback, selection of a panel involves not only securing panelists but also ensuring a robust completion percentage so that study results are rigorous. Seminal researchers in the development of the Delphi instrument believe a study of 10-15 respondents engaged throughout the proceedings provide accurate and verifiable results for a study (Linstone & Turoff, 2002). In order to account for participants who will drop from the proceedings, instrument researchers suggest beginning a study with a higher number of participants (Creswell, 2008).

The research project began with 20 experts, four from each of the five congruous fields of MOOC stakeholders: MOOC developers, MOOC professors, distance and/or online education researchers, cultural critics, and political or governmental voices. Each round of the Delphi study ran for two weeks to allow experts ample opportunity to engage the instrument at a time of convenience. Experts were individually notified when the instrument opened, as well as when it would be closing and a new round would commence. Select participants asked the researcher for reminders to access the instrument, which were provided as agreed upon by both parties.

All 20 experts completed the first round of the Delphi study. It is important here to define *round completion* in terms of the study. As per institutional review board policy, participation in an affiliated study is optional, and participants may choose to skip questions throughout the instrument. Therefore, completion of this study is defined by the act of pressing the submit button at the end of the online questionnaire rather than full and complete interaction with written response and Likert scale across all 12 prompts. To that extent, a number of participants omitted various Likert scales and written responses. In one case, a respondent only answered along the Likert scale, while another respondent only answered along the written discussion.

Round 2 of the Delphi study had 17 of 20 participants complete the instrument. Due to the iterative response nature of the instrument, experts absent from Round 2 discussion and response were not invited to participate in Round 3. 13 of the 17 remaining participants completed Round 3 of the instrument, for a start-to-finish completion rate of 65%, and a final expert number of 13, well within the boundary associated with successful Delphi studies. Table 1 displays the participation rate across stakeholder discipline. As seen in the table, participant attrition was spread throughout stakeholder designations. Moreover, feedback from participants

Table 1

Completion Rate of Experts in Delphi Study over Three Iterations

Stakeholder Association	Round 1	Round 2	Round 3
MOOC Developers	4/4	3/4	3/4
MOOC Professors	4/4	3/4	2/4
Distance/Online Education Researchers	4/4	3/4	2/4
Cultural Critics in Education	4/4	4/4	3/4
Policy Voices	4/4	4/4	3/4
Total	20 (100%)	17 (85%)	13 (65%)

who did not complete all rounds of the Delphi study listed external time commitments as the reason for inability to continue. This information leads to the conclusion there was no significant relationship between the study instrument and participant attrition.

Defining Consensus

Part of the purpose of a Delphi study is to gain consensus on aspects of the phenomenon in question (Linstone & Turoff, 2002). In order for expert discussion to best serve topics lacking definitive consensus, any prompt receiving 75% or more agreement was removed from subsequent questionnaire iterations. While expert participants had four possible choices on the Likert scale (strongly disagree, disagree, agree, strongly agree), for purposes of consensus all agree-based answers were weighed against all disagree-based answers. The weight of answers (strongly disagree versus disagree, agree versus strongly agree) was a consideration for participants in subsequent rounds of the instrument.

Summary

This chapter has elaborated the methods used to design and evaluate a Delphi study engaging experts in the realm of Massive Open Online Courses on the phenomenon: what the MOOC means in regard to the structure of higher education as well as the meaning of higher education for individuals and society. As the MOOC is a recent phenomenon and the learning model involves multiple stakeholders, expertise is defined for developers, instructors, researchers and critics. Prior to the research, a pilot of the instrument was run through with stakeholders as defined above. Experts engaged in a multi-iteration questionnaire session, providing responses to paraphrased quotations existing in recent literature and responding to the consensus of the group as well as individual touchstones. As is typical with most Delphi studies, the iterations continued for three rounds, until consensus was reached among the experts on several topics, while conversation reached a place of stasis on others.

Chapter 4: Results

The purpose of this research study was to determine at what places experts and stakeholders associated with Massive Open Online Course could come to consensus on issues regarding the model as a learning instrument and sociocultural phenomenon. To do this, the study created a survey instrument and executed it through a Delphi mechanism of expert-centered controlled feedback across three rounds of discussion. Panelists responded to 12 prompts paraphrased from existing MOOC literature both in written discussion format as well as on a Likert scale, in later rounds incorporating the selected feedback of other panelists into their responses and answers.

Restatement of Research Questions

As noted in Chapter 3, this study is directed by two research questions:

1. To what extent can experts in the MOOC phenomenon agree about its likely impact on higher education? Where do their opinions differ?
2. To what extent can experts in the MOOC phenomenon agree about its role in the historical, social and cultural shaping of higher education? Where do their opinions differ?

In order to answer these questions, the 12 literature paraphrases developed into prompts for the Delphi questionnaire highlight many of the modular, systematic, historical, theoretical, political, economic, social and cultural issues surrounding MOOCs as noted in Chapter 2 of this study.

Restatement of Research Prompts

As noted in Chapter 3, the 12 instrument prompts were paraphrased quotations and excerpts from existing literature related to the MOOC phenomenon. Each prompt handled a

specific belief or contention previously expressed in MOOC discussion based around one of three points: the MOOC as a structural learning model, the MOOC in historical, political and pedagogical contexts, and the MOOC's role in determining attitudes of culture and society toward higher education. Quotations to paraphrase were chosen from varying lenses and ideologies regarding the MOOC so as to present provocative statements evenly balanced between MOOC enthusiasm and MOOC criticism. I have added hashtags for each prompt in bold, which will accompany reference to the prompts in subsequent discussion.

> *Prompt 1* - Education through the use of short video lectures and online interactive prompts is a sufficient learning engagement for students. *#videolecture*

Prompt #1 is a paraphrase of content in a keynote presentation at the Sloan-C 18th Annual International Conference on Online Learning entitled *Democratizing Higher Education*, presented by MOOC instructor and Udacity founder Thrun (2012). The prompt was included to address the pedagogical practices in MOOC courses designed and implemented prior to the Delphi study. While some scholars see the mixture of short video lecture and interactive assessment prompts as a pedagogical revolution (Cheal, 2013), others view the model as regressive (Siemens, 2013a) and bereft of current best practices in online learning (Bates, 2012).

> *Prompt #2* - MOOCs do not provide personal learning. Personalization is business-speak for FAQ and customization, where two-way communication is almost non-existent and no one is known to anyone else. *#personalization*

Prompt #2 is a paraphrase of content in a Harvard Business Review guest column by Dr. Gianpiero Petriglieri (2013), Professor of Organizational Behavior at the European Institute of Business Administration. The prompt was included to address debate over how a scalable

learning model such as the MOOC can provide personalization, as well as address what constitutes personalization in a learning environment.

> *Prompt #3* - The data we gather from students utilizing MOOCs will help us solve student struggles in learning through redesigning the learning system and content modules. *#data*

Prompt #3 is a paraphrase of content from *What We're Learning from Online Education*, a 2012 TED talk from Stanford professor and Coursera co-founder Koller (2012). The prompt was included to address what level of importance learning analytics held in MOOC futures, as well as the future of education at-large.

> *Prompt #4* - How can MOOCs solve the education crisis if they cannot benefit non-traditional university students (as evidenced by the Udacity/San Jose State University courses in the Spring of 2013)? MOOCs are great if you are an autodidact or hold a graduate degree, but if not… *#autodidact*

Prompt #4 is a paraphrase of content from a blog entitled *MOOCs, Coursera, Online Education and Performing Innovation* by education columnist and Ph.D student Tressie McMillan Cottom (Cottom, 2012). The prompt was included to address historic distance education research and new MOOC studies that show distance education initiatives primarily serve self-directed learners with a history of success in learning environments.

> *Prompt #5* - Education, once a public good, is no longer. MOOCs re-imagine the system of higher education as spaces of individual accreditation and colonialist knowledge dissemination, rather than community spheres and spaces for knowledge creation and collaboration. *#publicgood*

Prompt #5 is a paraphrase of an article from *Academic Matters: The Journal of Higher Education* by African literature postdoctoral fellow and education blogger Bady (2013b). The prompt was included to address a thread of MOOC discussion concerned with the MOOC as representative of education as solitary improvement for employment prospects rather than a societal good that benefits communities and cultures.

> *Prompt #6* - MOOCs allow anyone anywhere to take coursework from the best universities in the world at no charge. It is not only a global education initiative, but a democratic one too. *#democratization*

Prompt #6 is a paraphrase of content from an opinion article by New York Times columnist Brooks, entitled *The Campus Tsunami* (Brooks, 2012). The prompt was included to address a MOOC narrative where the learning model has the potential to democratize education on a global level.

> *Prompt #7* - As of now, there are no online education experts. There are anecdotes, stories and ideas, but nothing supported by data. *#expertise*

Prompt #7 is a paraphrase of content in an October 9, 2013 presentation at San Jose State University from MOOC instructor and Udacity founder Thrun (Alexander, 2013). The prompt was included to address similar cultural attitudes and organizational perspectives toward educational history.

> *Prompt #8* – MOOCs challenge professors to be better. The great courses and pedagogues will rise to the top, and the average ones will have to get better or go home. *#professors*

Prompt #8 is a paraphrase of content from an opinion article by New York Times columnist Friedman, entitled *Revolution Hits the University* (Friedman, 2013a). The prompt was included to address popular discussion regarding the MOOC as a unique pedagogical tool for professors.

> *Prompt #9* - MOOCs are a disruptive technology in education. Not only do they change cost and scale, but they change the purpose of higher education from what knowledge/competencies a student acquires to what a student can do with knowledge/competencies. *#disruptive*

Prompt #9 is a paraphrase of content from a Wired magazine article by Harvard Business School professor Clayton Christensen and Innosight Institute Executive Director Michael Horn, entitled *Beyond the Buzz, Where are MOOCs Really Going* (Horn & Christensen, 2013). The prompt was included to address the labeling of MOOC as a disruptive technology in popular literature, and specifically how the MOOC works as a disruptive force.

> *Prompt #10* - To say the MOOC is exemplary because it provides the best instructors from the best colleges is an imperialist attitude. Why do Stanford, Harvard or MIT get to produce globalized authority*? #imperialism*

Prompt #10 is a paraphrase of content from a blog by professors Susan Amussen (British History – University of California, Merced) and Allyson Poska (Spanish History – University of Mary Washington) entitled *Guest post on the Lords of MOOC Creation: who's really for change, and who in fact is standing athwart history yelling STOP* (Amussen & Poska, 2013). The prompt was included to address the relationship between university and pedagogy, as well as the importance of institutional brand to the MOOC phenomenon.

> *Prompt #11* - The MOOC allows providers to offer tier-based education opportunities: Any customers my take a free course, others opt in for extra interaction with a tutor, some

choose extra interaction with a professor, and a few take the course in-person. Each tier would require higher levels of cost to the consumer, but would include higher levels of service. *#tierbased*

Prompt #11 is a paraphrase of content from a blog by North-West University (South Africa) economics professor Waldo Krugell, entitled *On-line education and MOOCs* (Krugell, 2013). The prompt was included to address education from an economic perspective, and the way in which businesses and policy groups view MOOC not as an educational model but an economic one.

Prompt #12 - The administrative and political push towards online learning and blended courses is not driven by an interest in pedagogy, but rather a restructuring of higher education that replaces human resources with online cartridges. #labor

Prompt #12 is a paraphrase of content from an article at Slate by Colorado State University history professor Jonathan Rees, entitled *The MOOC Racket: Widespread online-only higher ed will be disastrous for students – and most professors* (Rees, 2013a). The prompt was included to address the economic argument from the perspective of professional employees, and how MOOCs fit into society's view of the future of education and educational professionals.

Results

As the Delphi research methodology is designed to engage experts in a dialogue geared at gaining consensus on topics, the researcher determined that providing results across a linear timeframe would provide more opportunities to engage the discussion at the core of the research study, rather than dividing analysis based on prompt. Delphi research studies capture a phenomenon at a unique space and time, and that documentation, along with spaces of consensus, is what makes the methodology rigorous and viable (Creswell, 2008).

Round 1: Consensus. Only one prompt in Round 1 reached the consensus level of 75%, Prompt #3, experts agreeing with the contention that back-end data gathered from MOOCs would help solve learning struggles. Table 2 shows the results of instrument prompts to reach consensus in Round 1.

Table 2

Likert Results on Consensus Prompts - Round 1

Survey Topic (n = 20)	Strongly Disagree	Disagree	Agree	Strongly Agree
Prompt #3 #data	5%	11	79	5

The positive view of data from a consensus majority of the expert panel potentially comes due to the panel's make-up. Although panelists were chosen from five distinct disciplines, it was the congruence to MOOCs and educational technology that forecast expertise within the phenomenon. Panelists were bullish on back-end data in part because panelists were bullish on the overall confluence of education and technology. Participant E8 stated, "Computer based learning generally, and the whole innovation mindset as brought to teaching and learning, will transform the possibilities for learning research and teaching practice." Participant E12 added, "The analytics provided by MOOCs (and other online learning) can provide a window into actual student performance – missing in most F2F and online learning today."

Much of the commentary from experts revolved around the role back-end data would play in the development and role of instructional design in MOOCs. Participant E2 stated, "With analytics on large numbers of learners, designers will recognize which activities and learning modules are working well and which need to be revised." Added participant E15, "If the feedback loop is set up properly to gather the right data to answer questions about design, it is a good mechanism for improvement through redesign."

Instructional design is the practice of building learning events to assist a student's mastery of content, a discipline heavily influenced by cognitive science (Mayer, 1992). A criticism of instructional design comes from its systematic worldview (Gordon & Zemke, 2000) focused on the experience of the designer's objective rather than a student-centered process of development. Such concerns were echoed in the comments from dissenting voices, as well as by some experts in agreement with the prompt. Focused specifically on MOOCs, participant E6 stated, "…the typical college student does not participate in a MOOC (only 3% of college students have taken a MOOC), so the data collected in MOOCs cannot be easily generalized to the whole population of college students easily." Participant E14's criticism was more generalized:

> …most of the data gathered is in response to questions or cues formulated not by learners but by designers and instructors. Designers and instructors do not inherently understand learning. They understand design and instruction. I have worked in online learning for over a decade now, and I have yet to see statistics or data generated by an online courses that had [at] their center the learner's interest. We want to know if we're winning at instruction, and so we gather data that answers that question. But these sorts of assessments don't measure learning, they measure instruction.

Perhaps this is why much of the positive response to the prompt was muted or reserved, as experts wrestled with overlapping theoretical approaches to learning. Participant E7 stated, "…information about where students struggle is useful. However, it will not obviate the need for guidance – I think the information sets are too complex and interrelated to be amenable to solutions by machine."

Round 1: Evident majorities. There were eight first-round prompts that resulted in evident majorities of belief but did not reach a high enough majority to achieve consensus and be subsequently retired from the study: Prompts #1, 2, 5, 7, 9, 10, 11 and 12. Table 3 shows the results of instrument prompts that did not receive consensus in Round 1 but held strong majorities.

Table 3

Likert Results on Evident Majority Prompts – Round 1

Survey Topic (n = 20)	Strong Disagree	Disagree	Agree	Strong Agree	Percent Disagree	Percent Agree
Prompt #1 #videolecture	26%	47	27	0	73	27
Prompt #2 #personalization	11%	58	26	5	69	31
Prompt #5 #publicgood	35%	35	18	12	70	30
Prompt #7 #expertise	67%	0	28	5	67	33
Prompt #9 #disruptive	24%	47	24	5	71	29
Prompt #10 #imperialism	5%	28	39	28	33	67
Prompt #11 #tierbased	11%	17	67	6	27	73
Prompt #12 #labor	28%	39	33	0	67	33

Evident in the snapshot from Table 3 is the panel's propensity to disagree with prompts regardless of the lens of the prompt; panelists disagreed with prompts that presented the MOOC in ways similar to the dominant mainstream narrative (prompt 1 *#videolecture*; prompt 9 *#disruptive*) as well as prompts highly critical of mainstream foci (prompt 5 *#publicgood*;

prompt 12 *#labor*). Six of the eight prompts listed in Table 3 had a majority disagreement; factor in slight disagreements in the remaining prompts (see Table 4), and three-quarters of prompts in Round 1 balanced on the disagree side of the scale, a fact noticed by members of the expert panel such as participant E19's notation of the volume of audible disagreement in the first round of the study.

Disagreement on prompts was echoed in discussion, where expert disagreement was met with questioning definitions for terms and phrases within the prompts. In prompt 1 *#videolecture*, participants E3, E9 and E19 each questioned how the prompt defined the terms *sufficient* and *student*. For participant E9, "Sufficient is a poor benchmark for our students," and "Anyone who is equipped to learn from a book in the library or from videos and online prompts is more than a student." In prompt 2 *#personalization*, participants E1 and E19 questioned the prompt's interpretation of *personalized learning*, and participant E14 expressed difficulty with the prompt based on the varying definitions of the term MOOC:

> This statement is problematic because of the term "MOOC". In its original, connectivist form, the massive open online course was, in fact, fueled by two-way communication (or three-, four-, twenty-way communication) because learning occurred nodally. In that kind of MOOC, learners largely taught each other, and so learning could only happen if participants reached out to one another. The larger, "x" MOOCs of Udacity, edX, Coursera, and the like have been designed to isolate the learner from the instructor.

Failing to establish consistent vernacular for the MOOC field thus creates greater obstacles in orchestrating proactive discussion and development of the phenomenon. While researchers such as Gardner Campbell believe that it is a positive for the field of educational technology that every letter in the MOOC acronym is negotiable (Campbell, 2013), this aspect of the

phenomenon removes a foundation on which oppositional and disparate voices can communicate effectively about MOOCs (Kernohan, 2014). Expert E15 put it succinctly, "All MOOCs are not the same."

While the Delphi method is designed to spur discussion around topical differences of opinion, the differences of understanding and defining field-specific terminology inherent in the MOOC phenomenon created a debate of factual content within the Delphi study. This was most evident in prompt 7 *#expertise*, where experts debated whether or not the academic field of online learning, an academic discipline first endeavored 50 years ago and widely recognized for more than 20 years, was a space consisting of field experts and relevant data. While all of those who disagreed with the notion *there are no online learning experts* strongly disagreed with the wording of the prompt, one third of respondents agreed with the statement. Expert E11 noted how advice given when an early instructor was experiential and not data-driven, and this seemed to be the status quo in online education: "Sebastian [Thrun] and Daphne [Koller] and Andrew [Ng] know more than almost anyone, but my impression is that their knowledge is more experiential than data-driven." This and similar comments were contrasted by those who strongly opposed the prompt, including participant E6, who noted, "There is plenty of research about online education supported by data (and people who know that research). The MOOC people have just decided not to read any of it."

Within this debate of what determines online learning expertise seemed to be another crisis of definition, this one regarding what constitutes *data* and what is captured through the emerging field of learning analytics: is data in online education a back-end feature of a learning management system where platform use behaviors can identify spaces of struggle and success, heretofore unavailable because technological apparatuses lacked the structure and audience for

viable features? Or is data more nuanced and environmental, the history of distance education endeavors filled with numerous and various data sets? Participant E2 framed the emerging debate, "The bigger question is how 'data' is framed…If data is framed by clicks, then the statement is nonsensical. Social systems require data beyond the shallow elements captured by clickstream data." The notion that back-end information can offer education solutions in a vein similar to back-end data's influence on advertising and media consumption was questioned by other members of the expert panel. Participant E20 stated, "I think right now many MOOC providers see data in terms of A/B testing -- which they argue is about improving content but, based on their background in Internet advertising, I think means simply garnering better clickthrough metrics." Expert E14 approached the subject from a more social scientific lens:

> That this statement assumes data leads to expertise is also incorrect. Data only leads to the illusion of understanding. But data sets will always vary from learner group to learner group, from subject to subject, from LMS to LMS, &c. The collection of data is a hobby, it does not lead to expertise. In truth, it is anecdotes, stories, and ideas we must equip ourselves with if we hope to succeed in any learning environment.

As evidenced by the success of prompt 3 *#data*, many experts saw the unique data sets available to the MOOC platform as important to the study of education and unique to the field, the MOOC providing an avenue to gain unique and significant data on student learning. Participant E3 acknowledged that significant amounts of data on online education exist:

> However, it's an extremely diverse range of pedagogy, and technology has changed so much during the past two decades. We don't have enough data, and we need to do a better job of interpreting the data we have. There are many "experts" who don't base their statements about online education on data, but that's different than saying there is no data.

The theoretical differences highlighted in the responses of panelists E3 and E14 point to a longstanding question of qualitative and quantitative methodologies in education (Creswell, 2008). Education as a field of study is classified within the social sciences, but many of the developers of MOOC platforms come from hard science backgrounds. Moreover, the significance of quantitative data within American culture has grown over the past decade, its influence in research on fields as diverse and wide-ranging as aviation, baseball and political polling is now well-documented (Silver, 2012).

Participant E19's statement, "We need more data, but we now know more about MOOCs than we know about the conduct of most traditional seminars and lectures," echoed not only participant E3's interest in analyzing the unique data afforded to the MOOC platform but also another trend across Round 1 of the study: that while it has faults, the MOOC not only has the potential to be better than the status quo, it already is. This focus on the dichotomy of MOOC versus a stereotypical traditional college environment was pervasive across many of the prompts. In response to prompt 1 *#videolecture* questioning MOOC pedagogy as sufficient for student learning, participant E6 stated, "In many ways I think this is a better practice than going to a lecture in a classroom." Participant E3 added, "If watching a lecture and completing a multiple-choice test is considered sufficient learning engagement in a traditional college environment (and it is), there is no reason it should be considered insufficient online." In response to Prompt 5 *#publicgood* questioning the MOOC as representative of education's shift from a public good to a private one, participant E11 said:

> If I had to characterize a system of education as 'spaces of individual accreditation and colonialist knowledge dissemination,' it'd probably be the university system we have now, where learning and degree granting is largely limited to the campus community.

Such thoughts echo longstanding historical arguments branding education as a broken institution (see Chapter 2), an argument that began in public policy but today permeates broader institutional and social conversations. In these conversations, the question of what sort of intervention is necessary for solvency is secondary to the necessity of any intervention (McLaren, 1998). Despite expert discussion of the emergence of data and need for collecting and adequately analyzing incoming data, some experts used observation and experiential knowledge to conclude MOOC as superior to the existing system.

The other longstanding educational impasse evident in discussion during Round 1 prompts involved the learning theory at the heart of MOOCs and its congruence with learning theory at the center of contemporary educational research. As noted in addressing the Round 1 consensus on prompt 3 *#data*, much of that prompt's conversation revolved around the dynamics of instructional design, an aspect of education borne of cognitive learning theories. Cognitive learning theory was evident throughout the prompts of Round 1, both in tacit fashion as well as overt mention.

A number of experts, including panelists E11 and E16, responded to the prompt 1 *#videolecture* assertion *learning through short video and interactive quiz is sufficient* by noting sufficiency is dependent on the learning style of the student. The concept of learning styles, dating back to the work of David Kolb in the 1970s, states that individuals gain and process information in different manners, and by understanding what delivery method best suits a student will aid in their comprehension and learning (James & Gardner, 1995). While the concept of learning styles has been used in various education discussions and is a foundational aspect of Jenkins (2008) notion of personalized learning, the limited amount of methodologically sound

research on learning styles has shown no evidence to support the theory (Pashler, McDaniel, Rohrer, & Bjork, 2008).

The confluence of varying learning theories and ambiguously defined learning models is evident in prompt 2 *#personalization*, phrased as to view personal learning as indicative of the technological advances in learning management software as advocated by Jenkins (2008). The prompt utilizes the term *personal learning* in an effort to identify with the three existing terms in the field: Jenkins' *personalized learning*; the concept of *personalization,* defined by participant E12 as "a technical or design feature" of a learning system involving algorithm-enhanced customization; and *personal learning networks*, a term employed by distance education researchers such as Couros (2010) where learners engage in various networks of people and information to supplement and support their learning. Both *personal learning* and *personalization* are concepts rooted in a cognitive/machine learning lens of education, while a *personal learning network* is more indicative of Lave and Wenger's (1991) concept of a community of practice. Engaging the concept of *personal* in an online learning context can therefore mean different things to different experts. Participant E7 saw personal learning as "FAQs, algorithm-driven 'customization' and undue reliance on student-student interactions that are not guided in any meaningful sense." In contrast, participant E8 stated, "The experience of learning online, including from MOOCs, is highly personal because no two people go about it in exactly the same way. It is private in a sense because within the structure of the web people can follow whatever paths strike their fancy, as opposed to a classroom where sometimes a group is put through its paces all together."

Round 1 – No clear frontrunner. While each of the remaining prompts from Round 1 had a majority of disagreement, the ratio of disagree to agree was noticeably lower than other prompts in the survey. Table 4 documents the Round 1 results for these prompts.

Table 4

Likert Results on Lesser Majority Prompts – Round 1

Survey Topic (n = 20)	Strong Disagree	Disagree	Agree	Strong Agree	Total Disagree	Total Agree
Prompt #4 #autodidact	22%	39	28	11	61	39
Prompt #6 #democratization	11%	44	39	6	55	45
Prompt #8 #professors	12%	53	29	6	65	35

Two of the prompts (6 *#democratization*, 8 *#professors*) detailed the potential of MOOCs in positive terms well-established in MOOC media narrative, while the third (4 *#autodidact*) questioned the efficacy of the MOOC as an agent of educational change in the wake of the San Jose State University/Udacity partnership that resulted in MOOC students receiving lower grades than their traditional brethren (Schuman, 2013).

Experts noted the difficulty in aligning themselves with an agreement or disagreement based on the multiple variables in the prompts as well as the distinct tone of each prompt. In regards to prompt 6 *#democratization*, where the MOOC is a globalizing agent for education, participant E3 said, "While this statement is, for the most part, factually accurate, I find the rhetoric troubling…Referencing 'the best universities in the world,' suggests that the most prestigious institutions should be the source of teaching for everyone else." Expert E1 stated, "I wish there was a more middling response here. I do think that MOOCs are offering courses from the most prestigious universities (is that 'best'? Hmmm). I think this is a global initiative. Is it

democratic? No." In regards to prompt 4 *#autodidact*, which labeled the MOOC as unable to solve crises surrounding higher education, participant E19 noted, "MOOCs can't solve *the* education crisis, because there are several overlapping crises," going on to label them as: affordability of higher-education-as-job-training, the tension between the expansion of tertiary education to a larger percentage of the country versus the unpreparedness of those students, and the falling value of a Bachelor's degree. Participant E19 noted that the MOOC could benefit some of those issues but at the same time would add greater strain to others; for example, online education can bend the cost curve in regards to affordability, but by increasing access to higher education the law of supply and demand would further erode the value of a degree or credential.

Perhaps the difficulty experts found in aligning themselves with an agreement or disagreement on these prompts stems from their relationship to the future of the MOOC phenomenon rather than a critique of its past. Regardless of whether the prompts encapsulate structural aspects of MOOCs, pedagogical issues or sociocultural aspects of the learning model, prompts such as 5 *#publicgood* (education is not a public good and the MOOC signifies a change in how society views education) and 12 *#labor* (administrators like MOOCs because they will allow human resources to be replaced by machines) relate to existing decisions and debates, while prompts 4 *#autodidact* (MOOCs will not solve the education crisis), 6 *#democratization* (MOOCs will democratize education) and 8 *#professors* (MOOCs will create a meritocracy within professorial ranks) imagine futures. While the Delphi methodology is designed to forecast futures impacted by a recent phenomenon, perhaps the ambiguity of terms and definitions inherent to the MOOC phenomenon create a difficulty for experts to engage in a reasonable future-based discussion.

Round 2: Consensus. Three prompts received a consensus majority in Round 3: disagreement on prompt 6 *#democratization* (MOOCs as a democratization of education on a global level), disagreement on prompt 7 *#expertise* (there are no online education experts, only anecdotes unsupported by data), and agreement on prompt 11 *#tierbased* (MOOCs offer an opportunity for institutions and course providers to offer tier-based education options to consumers). Table 5 shows the consensus breakdown.

Table 5

Likert Results on Consensus Prompts – Round 2

Survey Topic (n = 17)	Strong Disagree	Disagree	Agree	Strong Agree	Total Disagree	Total Agree
Prompt #6 #democratization	19%	56	25	0	75	25
Prompt #7 #expertise	56%	19	25	0	75	25
Prompt #11 #tierbased	6%	19	69	6	25	75

Prompts 6 *#democratization* and 7 *#expertise* had majorities of disagreement in Round 1, while prompt 11 *#tierbased* had a majority of agreement. The disagreement majority of prompt 6 *#democratization* was slight in comparison to those of prompts 7 *#expertise* and 11 *#tierbased*. Interesting for all three were the number of experts who changed their mindset on the prompts, as seen in Table 6. Such movement is indicative of the importance of group responses and controlled feedback in a Delphi study (Linstone & Turoff, 2002). This could be seen in the manner in which participants utilized the selected quotations of expert panelists when shaping their Round 2 responses. In Round 1 of the survey instrument, participant E8 responded to the democratizing missive of prompt 6 *#democratization* by saying, "'Anyone,' 'anywhere' who has a computer, Internet access, English skills, free time, self-confidence, and experience as a

Table 6

Number of Experts Changing Answers in Round 2

Survey Topic (n = 17)	Agree to Disagree	Disagree to Agree	Ratio of Expert Changes to Total Experts
Prompt #6 #democratization	5	2	7/17
Prompt #7 #expertise	3	1	4/17
Prompt #11 #tierbased	2	3	5/17

learner. Openness by itself is not access." In Round 2, four experts directly quoted this passage when offering their new responses. Regarding the lack of online education expertise offered as prompt 7 *#expertise*, three people directly responded to participant E11's statement, "Sebastian and Daphne and Andrew know more than almost anyone, but my impression is that their knowledge is more experiential than data-driven."

It is important to note that not all reference to expert quotations was done in agreement. Prompts worked not only to bolster agreement (several participants chose to assign a "+1" to prior round responses rather than draft new ones), but also to challenge beliefs and ideologies. Regarding participant E8's above quotation listing the necessary materials and skills for a MOOC learner, participant E19 responded, "It seems worth noting that this is a much, *much* lower set of hurdles than 'Can relocate for 4 years, has access to tens of thousands of dollars of free cash flow per annum.'" In response to participant E11's statement about the lack of data supporting the pre-MOOC field of online education, participant E9 replied, "That statement represents the biggest problem with MOOCs – that many people involved with MOOCs completely ignore the decades of research on online learning."

The use of expert quotations as controlled feedback to facilitate discussion did not only regard the direct issues within the prompt. Experts used these quotations as springboards into other issues and topics germane to the MOOC phenomenon. In prompt 6 *#democratization*, participant E8's quotation "openness by itself is not access" led to a number of respondents debating the meaning of the term "open" in the MOOC phenomenon. Said expert E14, "The issue of openness is another thing entirely. Open learning is, and must be understood to be, available only to those who possess access to the Internet, and the skills to make that access count." Participant E6 added, "So Openness is not even a guarantee in the MOOC world. Does Openness mean open access or open materials?" Both of these responses seek to better define the meaning of open within the MOOC phenomenon, asking for clarification while offering their own substance as well. In this instance participants E6 and E14 created variations on *open* as MOOC nomenclature: Open Learning and Open Materials. While not entirely the same, the tenor of both terms resonates with the concept of Open Access. Open Access as an educational concept refers to a movement to make scholarly texts and research free of charge, license and copyright so that anyone can utilize the content. As mentioned in Chapter 2, the discussion of the meaning of *open* in the MOOC phenomenon is a contentious point of debate between connectivist education scholars and MOOC developers with backgrounds in artificial intelligence and machine learning. Open access is a discussion point in many of the issues facing education today (Kernohan, 2014); its emergence in a MOOC discussion despite exclusion from the prompt list signifies the interconnectedness of many of the issues inherent in the future of education today.

Tangential discussion of prompts was not limited to ideas brought into the discussion from experts. In prompt 11 *#tierbased*, a number of panelists who voted affirmatively regarding

the MOOC's potential as a tier-based education service opportunity made certain to note their affirmative vote was systematic and not based on a fondness for the idea; said expert E8, "To agree with [the prompt] as a scenario is not necessarily to say that it's a great vision." Added participant E10, "I agree that MOOCs can offer the tiered approach. I also agree with statements that this may not be such a good thing. Can we support social equity and economic mobility with such a tiered system?" While Likert results provided a consensus on the topic, discussion brought up questions about the potential implications of such a system on higher education, namely a conundrum where students who need the most assistance and support to succeed in the institution will be those who lack the resources to pay for the assistance/support tier. Said participant E10, "We know the 'have-nots' will receive the lowest tier, thus reinforcing current social structures." Added participant E9, "The people who need the most support will end up with the most debt because they had to pay for services to overcome the crappy instructional design in that elite MOOC." Several experts pushed back to the idea of a tier-based system reinforcing social stratification within higher education. Expert E13 said, "Cost does not need to be passed directly to the consumer; like in public education, it can be spread across a community." And participant E6 noted that offering services is just one part of the issue, saying:

> The irony in this statement is that many of these services, offered for free at teaching colleges and community colleges, go unused by students…Students don't generally think they need help, and those that do need help don't have the time to get it.

Experts were quick to label the economic model at the heart of prompt 11 *#tierbased* as an example of *freemium* business operations, a term designated by venture capitalist Wilson (2006) to describe a Internet-based business strategy:

> [G]ive your service away for free, possibly ad supported but maybe not, acquire a lot of customers very efficiently through word of mouth, referral networks, organic search marketing, etc., then offer premium priced value added services or an enhanced version of your service to your customer base. (para. 1)

This was one of a number of places where experts offered technology and business-based jargon into the discussion, their provision as if the terminology was commonplace. Another popular concept from prompts 6 *#democratization*, 9 *#disruptive* and 11 *#tierbased* was *unbundling*, a neologism associated with the way in which new media challenge the stability of older media sources through "break[ing] up the packages they once offered, providing particular parts of them at a scale or cost unmatchable by the old order" (Chatfield, 2012, para. 6). Unbundling is often associated with the concept of disruptive technology; however, its use in education transcends the MOOC phenomenon, at present being promoted heavily in the discussion of competency-based learning opportunities at institutions such as Southern New Hampshire University (LeBlanc, 2013). This adoption of outside jargon within an education-specific research study details the growing relationship between corporations and the institution of higher education, as noted in Chapter 2. Use of such jargon in expert responses to research prompts was mixed between affirmative toward the term/concept and negative about its intentions, but its unsolicited appearances in the study indicate a shifting discussion landscape.

The acceptance of business jargon in an educational study in conjunction with the difficulty for panelists to adequately define educational terms could be reason for the dichotomy on factual topics such as prompt 7 *#expertise*, dealing with the existence of online learning experts. As noted in Chapter 2, online learning as a field of study has roots dating back over 50 years, and in the last 15 years has impacted higher education not only through technological

designs such as learning management software but also market-based educational practices such as the rise of for-profit higher education institutions. With similar evidence backing up their viewpoints, many experts expressed a great frustration at what they perceived as a lack of historical understanding or recognition of online and distance education. Participant E9 summarized this thread of thinking:

> I have to address the statement by the panelist who said "Sebastian and Daphne and Andrew know more than almost anyone." That statement represents the biggest problem with MOOCs---that many people involved with MOOCs completely ignore the decades of research on online learning. None of what Daphne, Andrew, and Sebastian have done would even be possible without the decades of work that precedes MOOCs.

Whether the lack of knowledge regarding the history of online learning was wanton or naïve remained a space of debate for experts disagreeing with the prompt. Participant E4 theorized on the reason for a lack of knowledge of online learning as an academic and research discipline:

> Behind this statement though is a really uncomfortable fact…Until we require faculty to be trained to teach, they will not be made aware of all the research there is into teaching and learning (including online learning) so we will continue to get the ignorance demonstrated in the statement.

The quotation from participant E11 regarding the experience-based journey of the participant's roster of experts was also important to the responses from individuals who agreed with the assertion behind prompt 7 *#expertise*. The nature of the data variable in the conversation belies responses; not all experts subscribed to the notion that clicks were the framework of data aggregation in a MOOC. Said participant E7:

> …what does and does not apply to technology mediated instruction is unclear. The baseline of acceptance of educational theory, as any theory, is replication of results - to date there has not been a lot of replication, nor have we identified the relevant co-variant or causal factors.

Others looked at the systematic changes in technology in the past few decades and did not find congruence between those changes and distance education scholarship; participant E11 said, "The scale of online education coupled with the technologies for delivering content and interacting with students makes, for me, twenty-year-old research less applicable to today's MOOC ecosystem." What data is collected, what research question(s) should be considered, how data is coded, and what the data represents inside and outside the research question are variables where agreement was not found amongst the expert panel.

Round 2: Evident majorities. There were two Round 2 prompts that resulted in evident majorities of belief but did not reach a high enough majority to achieve consensus and be subsequently retired from the study: prompts 1 *#videolecture* and 10 *#imperialism*. Table 7 shows the results of instrument prompts that did not receive consensus in Round 2 but held strong majorities.

Table 7

Likert Results on Evident Majority Prompts – Round 2

Survey Topic (n = 17)	Strong Disagree	Disagree	Agree	Strong Agree	Total Disagree	Total Agree
Prompt #1 #videolecture	19%	50	25	6	69	31
Prompt #10 #imperialism	6%	25	50	19	31	69

Both prompts were also evident majority prompts in Round 1 of the study, and both largely remained intact from their Round 1 results.

Table 8

Number of Experts Changing Answers in Round 2

Survey Topic (n = 17)	Agree to Disagree	Disagree to Agree	Ratio of Expert Changes to Total Experts
Prompt #1 #videolecture	1	2	3/17
Prompt #10 #imperialism	0	1	1/17

Table 8 shows the number of experts who shifted answers between Rounds 1 and 2. In lieu of changes between agreement and disagreement, participants entrenched on these questions while referencing examples or existing literature to solidify their perspective. One of the main themes of Round 1, that of cognitive learning theory and its appearance in systematic features of the MOOC such as instructional design or the notion of learning styles, furthered its discussion through topics such as learner activity and the MOOC's ability to design learning systems producing higher order thinking. For the experts debating these elements of cognitive learning theory, Round 2 focused on what constituted *activity*. Some, such as participant E13, found evidence to support a positive view of the learning approach:

> …the preceding questionnaire together with this questionnaire itself is evidence of the sufficiency of learning engagement via (1) consumption of media and (2) response via interactive prompts. On the first questionnaire, I read provided material, considered it, then responded. Now on this second questionnaire, I just read new, related material based on our community's prior response, I'm considering it, and I'm providing a new response, learning well along the way.

Others, such as expert E19, saw potential for specific subjects to utilize the MOOC structure for active engagement: “Any class that can include problem sets (most of the sciences, much economics, programming, etc) can have well-designed student interactions.” On the negative side of the prompt, participant E17 supplied cognitive science to discuss the reason the learning model was not ideal: “Watching lectures and responding to multiple choice questions is very basic as it requires processing information on a passive level. In order to retain that information, the learner needs to apply the knowledge gained in the lecture. Without the application process, knowledge gained will only be held in short-term memory.” Added participant E4, “The problem with this statement is that it ignores the tons of research into best practices in online learning…In particular, there is a great deal of research on instructor presence in online learning – without it, students drop out very rapidly. It also has to be ‘quality’ presence, which means engaging in meaningful dialogue and discussion.”

Prompts 1 *#videolecture* and 10 *#imperialism* in Round 2 also brought new terminology to question and debate the definition of, this time being the notion of *students*. Some conversation focused on understanding *student* not only as a credit-seeking enrolled individual but more a *learner* whose enrollment status has no relationship to the course or coursework. Participant E20 asked, “’What is a MOOC an alternative to?’ From my experience, these are students who would not consider paying university tuition.” Added participant E8, “…the advent of "short video lectures and online interactive prompts," urges a deeper inquiry into what constitutes desirable levels of engagement and learning for anyone who chooses to participate in such (not just narrowly defined as for-credit students).” Such a definition might be viewed as democratizing the notion of *student* by removing its institutional ties, but other experts were certain to tie their definitions of *student* to the notion of a supported learner. Said expert E15,

"Most students need more engagement, feedback, and supports integrated with the learning process to successfully master learning outcomes." Added expert E9:

> Stanford, Harvard, and MIT do not have the best instructors; maybe they have the best instructors for their own students, many of whom would be fine with a pogo stick for a teacher (because these are highly-motivated, well-resourced, well-networked, and largely well-to-do students). But for students who are not in that category (read: MOST students), most Stanford, Harvard, and MIT professors are not going to cut it.

Is the use of *students* in MOOC discussion indicative of an enrolled degree-seeking individual, a lifelong learner, or a supposed global individual with the ability to be a degree-seeking individual but previously lacking those resources?

The resources and cultural cache of elite schools was further explored in Round 2. While there was very little movement on agreement or disagreement with prompt 10 *#imperialism*, many experts were quick to note that what the prompt referenced as "globalized authority" was not novel to the MOOC, but rather an historical precedent already existing within education, only highlighted by the MOOC. Said participant E19, "[Elite schools] are trafficking on reputations they already had. Now we'll find out how much of that reputation withstands public scrutiny." Added participant E1, "Harvard et al have had a long history of prestige. MOOCs tap into that." Participant E7 made clear that understanding the history of elite schools did not necessitate a misunderstanding of informed evaluation of expertise:

> One of the realities of education is that for most consumers it is analogous to medical treatment: consumers [and the public] don't have capacity or knowledge to accurately assess the effectiveness of treatment - they can only assess the impact on symptoms,

> which is a very different thing from efficacy of treatment. Likewise, "public" evaluation of education is largely doomed to failure.

The reputations of schools noted as *elite* and their relationship to classroom practices and pedagogy the focus of participant E14, who saw debates about academic reputation as missing the point of the learning aspect of what is branded an elite education:

> At the core of this debate is an idea that Ivy-league schools actually provide a better education. What's interesting about this is that instructors from other-than-ivy colleges feel (as apparent from the responses here) competitive, even combative about this assumption. And in this, MOOCs are indeed disruptive, for they have caused arguments to become more public that once only stewed behind ivory walls. I find the other responses quoted here to be offensive, not because I have any affiliation with Ivy-league schools, but because they play directly into an antagonistic relationship between community colleges, 4-year schools, and elite institutions. This does not help the discussion. As well, it points out that our own non-ivy colleges feel somehow colonized by those other institutions. I want to ask: how can we begin to have any kind of productive conversation about MOOCs, or digital pedagogy, or pedagogy in general, when we are so caught up in our own political warfare that we forget the learner altogether and worry only for our reputations and statuses?

Round 2: No clear frontrunner. While each remaining prompts from Round 2 had a majority disagreement, the ratio of disagree to agree was noticeably lower than for other survey prompts. Table 9 documents the Round 2 results for these six prompts. More than half of all prompts were categorized as lesser majority prompts in Round 2, with the number of prompts in this category

Table 9

Likert Results on Lesser Majority Prompts – Round 2

Survey Topic (n = 17)	Strong Disagree	Disagree	Agree	Strong Agree	Total Disagree	Total Agree
Prompt #2 #personalization	19%	38	38	5	57	43
Prompt #4 #autodidact	25%	37	38	0	62	38
Prompt #8 #professors	19%	44	25	13	62	38
Prompt #9 #disruptive	6%	38	31	25	44	56
Prompt #12 #labor	13%	44	37	6	57	43

doubling. This was due in part to sizeable movement on a number of prompts between Rounds 1 and 2, as shown in Table 10.

Table 10

Number of Experts Changing Answers in Round 2

Survey Topic (n = 17)	Agree to Disagree	Disagree to Agree	Ratio of Expert Changes to Total Experts
Prompt #2 #personalization	1	3	4/17
Prompt #4 #autodidact	1	1	2/17
Prompt #5 #publicgood	1	3	4/17
Prompt #8 #professors	1	1	2/17
Prompt #9 #disruptive	0	4	4/17

(Table 10 continues)

Table 10 (continued)

Number of Experts Changing Answers in Round 2

Survey Topic (n = 17)	Agree to Disagree	Disagree to Agree	Ratio of Expert Changes to Total Experts
Prompt #12 #labor	2	3	5/17

The largest change between Rounds 1 and 2 dealt with prompt 9 *#disruptive*, which labeled the MOOC as a disruptive technology that is part of a larger picture of disrupting higher education. In Round 1 71% of people disagreed with the prompt, highlighted by participant E2's statement, "What a terrible word – it needs to be taken out back and shot and never used by educators again." In Round 2 the prompt gained a slight majority of panelists who agreed that the MOOC was an example of a disruptive technology. This was the only prompt in any of the three rounds to vacillate from one response to the other. The reason for the change came largely from a disambiguation of the term *disruptive*. Literature from Horn and Christensen (2013) as well as Shirky (2012) defines *disruptive technology* as technology that based on simplicity enters a services trade at low market levels and eventually the simplicity of the disrupting technology topples the existing market. While experts did not offer a new definition, Round 2 discussion focused more on *disrupt* as a verb and not as an economic theory. Panelists E4 and E17 used *disrupt* when referring to the discussions about higher education borne of the MOOC movement. Panelist E19 offered a textbook definition of disrupt in support of the concept because "unlike a lot of jargon in either education or technology, [disrupt] is a plain English word that is not used with any special meaning in cases like this."

When incorporating the concept as defined by Horn and Christensen (2013), answers remained mostly in disagreement. Expert E1 said, "[Disruptive technology] seems to be applied

to almost everything in technology these days. Is it innovative to put courses online? Well it was over a decade ago. Now? Not so much." Added panelist E14:

> MOOCs have…called our attention to the need for global-level collaboration, decentralized classrooms, and better attention paid to the kinds of education that are possible in online media. But these things are not particularly disruptive – no more than someone pointing out that you've a bit of food on the end of your nose.

Though a shift occurred in the Likert voting on the topic, discussion showed resistance to believing that MOOCs cleanly fit into the theory of disruptive innovation.

Prompts 2 *#personalization*, 5 *#publicgood* and 12 *#labor* also saw a large number of panelists move their vote from agree to disagree or vice versa. Each prompt was presented as critical of the MOOC: prompt 2 *#personalization* questioned the relationship between MOOCs and personal learning, prompt 5 *#publicgood* asserted MOOCs as evidence of higher education's social movement from a public good to a private, and prompt 12 *#labor* argued that administrative pushes towards MOOCs were driven by economic influences and not pedagogical. Likert results moved slightly away from consensus for each prompt, a smaller majority in disagreement with each prompt's assertion.

A common theme for prompts 2 *#personalization*, 5 *#publicgood* and 12 *#labor* involved the role of economics in the evolution of MOOCs and their discussion within higher education. Many responses view the role of economics in educational technology around what Morozov (2012) calls Technological Solutionism, and the questions that should be asked around such a debate (Kamanetz, 2013). For some, such as participant E13, the technology behind the MOOC directly solves an economic problem of human reproduction of lectured content:

> A chef needn't slice cucumbers by hand, now that she has a food processor, and thus she can focus on higher-level food preparation tasks. A professor needn't lecture once at 10am, and again at 11am, now that her lecture can be recorded once and played anytime, and thus she can focus on higher-level teaching tasks.

For others in agreement with technology as an answer to education woes, such as participant E6, MOOCs were a step toward a solution but not the final answer:

> The level of remediation for college students continues to increase while simultaneously, the pressure to reduce cost and time-to-complete is also increasing. The only solution to this problem is better technology…However, I don't think MOOCs are the answer to the problem. Technology IS the answer, but not in the current form of MOOCs that we are seeing.

Disagreement on technological solutionism as an economic advantage for higher education argued that economics, not technology, drive the argument, such as participant E1's discussion of the proliferation of adjunct labor in higher education prior to MOOCs: "I think 'adjunctification' – something that definitely pre=dates MOOCs – shows that there is a huge problem with labor in higher education…the move to higher more adjuncts and fewer tenured instructors is not a pedagogical decision; it's a financial one. It's hard not to see MOOCs as an extension – with technology this time around – of this trend." Other disagreement focused on the lack of learning theory and design inherent in the technological solutionism debate, such as participant E14:

> I feel strongly that, if pedagogy were the focus, online learning would become as dynamic and demanding a field as classroom teaching, requiring as much, if not additional, resources to deliver. When online learning is looked at as a shortcut to

> teaching, as a budgetary boon, then learning has becoming nothing more than a line item. At that point, we should pretty much just turn around and start again, placing pedagogy at the center.

Similar to the discussion of technological solutionism and existing in Round 2 within prompts 2 *#personalization*, 5 *#publicgood* and 12 *#labor* is a continuation of the debate where MOOCs as presented are an improvement on existing educational practice. Much of this discussion revolves around the debate of democratizing education, a debate that implies education is a public good, and how MOOCs push that movement forward, either as evidenced by their product or through discussion of their disruption and potential. Some experts, such as participant E2, see that promise as fulfilled to an extent, at least in comparison to existing infrastructure: "MOOCs do more for open learning and public good than many existing public universities do." Added participant E17, "Education is in crisis because it has not changed for hundreds of years. It is about time it got caught up with the times. As MOOCs struggle with accreditation and a limited manner of knowledge dissemination, it is paving the way for future forms of education." Expert E13 encapsulated the discussion of public good and MOOC reality, saying:

> MOOCs make education available to a far greater community than be accommodated within traditional education means which require transportation to a physical location that may be far from home, and scheduling that may not accommodate the student's work or personal schedule. Engagement between those students -- synchronous, or asynchronous -- is easier when enabled through MOOC technologies additionally to any in-person engagement otherwise possible.

What bothered some who disagree with the premise that MOOCs are an improvement on existing practices was an ahistoricism that MOOC was a free substitute for *online learning*. Said participant E4, "What strikes me about so much of the discourse around MOOCs is how badly informed people are about online learning generally, tending to consider MOOCs as the only model of online learning, when this just isn't so." E4 continued to discuss the contradiction between the MOOC, its hype versus its practice, and the notion of public good.

> It's really important to separate out the reality of MOOCs and the often overblown hyperbole surrounding them. It's hard to blame MOOC providers/instructors for some of these claims, although in order to promote what is essentially a commercial operation, MOOC platform providers such as Coursera and Udacity have only themselves to blame for this kind of criticism…MOOCs are not the only answer. Many institutions have been offering fully online learning for credit very successfully for years, and open universities have existed in many other countries than the USA for decades.

Furthering discussion of the notion of public good in education and what could be seen as the MOOC's contradiction of such a good, expert E7 encapsulated the discussion as well as alluding back to the economic debate within these prompts.

> Education, like so much else, has been subject to what Habermas referred to as "economization of the life-world." Education was, can be, and should be a public good, producing benefits for society that sometimes far exceed benefits to the individual…One might note that the "colonialist" aspects of education, e.g., limited degree-granting restricted to universities, doesn't make much sense absent that individualist economic transaction understanding of education. After all, absent the economic implications of

> degree granting [aka knowledge certification], degree granting is not the major activity of education.

The concept of MOOCs as better than existing practices was also evident in prompts 4 *#autodidact* and 8 *#professors*. Prompts 4 *#autodidact* and 8 *#professors* saw little movement among experts between Rounds 1 and 2. This is not to say that conversation did not evolve to engage more than the prompt specific, but rather individuals utilized their resources and beliefs to entrench around the two topics. In regards to the MOOC as providing better educational experience than the existing system, prompt 8 *#professors* responses focused on how MOOCs have opened up opportunities for teaching excellence. Said expert E12, "The current system is closed and not responsive to teaching excellence. MOOCs are not perfect but they have engaged profs and admin on issues of what does define quality." Added expert E8:

> If what you value most [in a class] is the idiosyncrasies of encounter within a teacher-student dyad, that is probably endangered by the increased standardization of a MOOC model. If you are more interested in holding undergraduate teaching to the same standards of excellence that we do other professions, then I think MOOCs are generally a good influence.

However, while many experts noted increased discussion of teaching methodology and pedagogy due to the MOOC phenomenon, not all experts agreed with this happenstance as evidence of the MOOC as superior to existing product. Said participant E1:

> I do think that one of the benefits of the public discussions about MOOCs is that we're actually talking about pedagogy. But I am pretty skeptical about 'the best courses' or 'the best professors' being the ones that get the most attention.

Added expert E9, “Yes, many professors with whom I have worked have improved their teaching as a result of teaching online. But that’s not a MOOC phenomenon, that’s an online learning phenomenon.”

One of the points made in prompt 8 *#professors* regarding MOOCs as superior to existing practices focused on the model as an example of meritocracy, a theme discussed amongst experts in Round 1. Said participant E11, “The long-term outcome will likely be a robust marketplace where different teachers may present similar material and students can choose the approach that works best for them. I expect that the cream will rise to the top.” E14 teased out this idea by looking at the politics behind what make universities such as Ivy League or Tier 1 Research *elite* institutions:

> The entire premise of a research university is that professors who also advance the field with research are best equipped to teach the material on which their research advances build. As a faculty member at a research university, I tend to agree with this premise, not so much because it makes me a better teacher but instead that I have a much better idea of what's important when I teach.

This ideology was debated from a contrasting viewpoint by participant E14, whose thoughts debated not only the longitudinal discussion but theoretical issues of distance education elucidated by Peters’ (1983) theories on unbundling the various duties of a professor (see Chapter 2).

> The courses that interest more students -- and the teachers who do the same -- will be spread by those students to other learners. Popularity, not ability, will rule the day; and popularity requires a very different skill set from teaching or course creation. I believe that all teachers who will be teaching online should take acting classes. They are, after

> all, going to be seen on camera -- and how they are seen, and how they say what they say, will be considered more immediately than what they say or what they teach.

The argument that the takeaway from MOOCs will be cultural over content-based plays into a discussion from prompt 4 *#autodidact* regarding the effect of MOOCs on at-risk and non-traditional learners. As put succinctly by participant E8, "People who need education need more education than people who are already educated." Panelists agreed with this statement, but debated whether the MOOC itself was a mechanism to deliver such learning or a model that would confuse the institution without providing positive results. Said panelist E1:

> It's a great time for 'lifelong learning.' But I don't think that when we talk about the 'education crisis' that that's what we're referring to. It isn't simply a matter of making education more accessible; it's about supporting students through the institution. MOOCs don't do that well.

On the opposite side, some experts found potential within the results of the Udacity/San Jose State University experiment, such as panelist E2:

> We are at early stages of evaluating how MOOCs can be used for high-risk populations. Traditional education grapples with this as well. The edX/SJSU pilot was successful in improving performance of learners when a residential/MOOC pilot was initiated.

Others still believed the MOOC was a mix between a model for lifelong learning and a potential asset to high-risk students; said panelist E10, "…MOOCs mainly serve the lifelong learning or 'leisure learning' market. We may see some integration of MOOC-related technology into more traditional degree programs, but this is still in flux."

Round 3: Evident majorities. As noted in Chapter 3, Round 3 of the Delphi study was in process at the time MOOC corporation Udacity announced plans to focus energies on

education for businesses and professional development rather than existing higher education structures (Chafkin, 2013). While the Delphi instrument was not designed to measure the impact of such news on the responses and discussions within Round 3, experts on Delphi methodology have noted large impacts on studies where significant instances impacted the emerging phenomenon mid-study (Linstone & Turoff, 2002).

No Round 3 prompts reached a consensus. There were three Round 3 prompts that resulted in evident majorities of belief but did not reach a high enough majority to achieve consensus and be subsequently retired from the study: prompts 1 *#videolecture*, 5 *#publicgood* and 10 *#imperialism*. Table 11 shows the results of instrument prompts that did not receive consensus in Round 3 but held strong majorities.

Table 11

Likert Results on Evident Majority Prompts – Round 3

Survey Topic (n = 13)	Strong Disagree	Disagree	Agree	Strong Agree	Total Disagree	Total Agree
Prompt #1 #videolecture	18%	55	18	9	73	27
Prompt #5 #publicgood	11%	56	22	11	67	33
Prompt #10 #imperialism	0%	30	30	40	30	70

Prompts 1 *#videolecture* and 10 *#imperialism* remained a part of the Evident Majority level for all three iterations of the study, while prompt 5 *#publicgood* vacillated, moving from Evident Majority in Round 1 to Lesser Majority in Round 2, and back to Evident Majority in Round 3. Noticeable in Round 3 written responses is the growing preponderance to simply agree or disagree with the feedback prompts supplied as context within the new iterations rather than writing unique responses. The movement of experts on the prompts is noted in Table 12.

Table 12

Number of Experts Changing Answers in Round 3

Survey Topic (n = 13)	Agree to Disagree	Disagree to Agree	Ratio of Expert Changes to Total Experts
Prompt #1 #videolecture	1	0	1/13
Prompt #5 #publicgood	2	1	3/13
Prompt #10 #imperialism	1	0	1/13

The movement between Rounds 2 and 3 mirrors the movement between Rounds 1 and 2, with experts remaining steadfast about prompts 1 *#videolecture* and 10 *#imperialism* while more were willing to change perspective or opinion on prompt 5 *#publicgood*. Panelists expressed a difficulty incorporating the debate as it evolved between rounds for prompt 5 *#publicgood*, a prompt dealing with financial ramifications for education in response to its status as a public or private good. As noted by expert E17, "The water gets murkier as we continue to debate the issue of monetization." Participant E12 viewed the monetary debate as problematic due to increasing costs for individuals: "The US has priced itself out of [higher education] accessibility for huge portions of its population. MOOCs are cheaper and they are increasingly offered by public institutions as well as private." Participant E4 worried about MOOCs not as a tool for higher education but as a means of replacing existing structures:

> MOOCs on their own are a public good. It's when people argue that they are an alternative to a well-funded education system that I worry. Outside the USA, most OECD countries/economists do see public higher education as a public good, benefiting not only individuals, but the state and society as a whole. If though MOOCs undermine that belief, then they become dangerous.

Despite the prompt regarding the MOOC as democratizing higher education (prompt 6 *#democratization*) being retired after Round 2 due to consensus, participants continued to discuss issues tied into democratization and education, such as the concept of privilege as well as measuring success on a global level. Discussion around Prompt 10 *#imperialism* moved from global authority and a definition of *students* to issues from prompts 1 *#videolecture* and 8 *#professors*, namely the learning system design and the criteria that make a professor *elite*. Said expert E9:

> [Professors from elite universities] are often world-class experts and researchers, but their teaching often leaves much to be desired. This does not necessarily mean that they do not care about the educational experiences of their students, it just means that they often do not take into account the privilege and resources that their students bring to bear in the university environment. This privilege makes it possible for elite university professors to get away with mediocre teaching without negatively impacting too many of their students.

Participant E9 furthered the discussion by responding to a quote by participant E13, where E13 used as an example the Delphi survey instrument as evidence of the sufficiency of learning models congruent to the MOOC:

> I hope this panelist [E13] would recognize that he or she is not a novice learner, as many of our students are in various disciplines. The expertise that the panelist has developed to arrive at the point of even being a panelist makes their experience of the Delphi questionnaire completely different than someone who is less expert in these topics.

A belief in the necessity of scaffolding to combat existing privilege was viewed by some as a weakness of existing educational pedagogy, one the MOOC could potentially circumvent through instructional design. Said participant E12:

> It is true that teaching presence is associated with higher completion rates and performance, but this is not a great thing. We should be helping students to be come self-motivated and confident lifelong learners, able to learn with or without teachers – and not continuing to place ourselves at the center of students' learning.

This emphasized a lack of cohesion amongst the expert panel on defining *sufficient learning* as mentioned in Prompt 1. Said panelist E1:

> I'm really stuck with the phrase "sufficient learning engagement" here, as I fear that it means that this interesting opportunity that we have – a moment where we are talking so actively and publicly about teaching and learning with technology – will be lost because we can do what's 'easy' and what's 'sufficient.'

Added expert E17, "Public evaluation [of the learning experience] was never the goal…educators need to lead the charge and not organizations."

Round 3: No clear frontrunner. The remaining prompts in the study did not achieve consensus or a high majority, with three of the five reaching an even split in the Likert voting. Table 13 shows the results for these prompts. Some of the movement can be attributed to participant attrition; due to the loss of several experts between Rounds 2 and 3, Prompts 2 and 4 moved away from consensus despite no change in expert voting.

Table 13

Likert Results on Lesser Majority & Split Prompts – Round 3

Survey Topic (n = 13)	Strong Disagree	Disagree	Agree	Strong Agree	Total Disagree	Total Agree
Prompt #2 #personalization	10%	40	50	0	50	50
Prompt #4 #autodidact	11%	45	33	11	56	44
Prompt #8 #professors	0%	50	20	30	50	50
Prompt #9 #disruptive	0%	50	50	0	50	50
Prompt #12 #labor	20%	20	40	20	40	60

However, space for change and discussion remained, as shown in Table 14. The most notable shift in alignment came with prompt 12 *#labor*, which shifted back to a majority agreement after being majority disagreement in Round 2, accompanied by close to half of respondents changing

Table 14

Number of Experts Changing Answers in Round 3

Survey Topic (n = 13)	Agree to Disagree	Disagree to Agree	Ratio of Expert Changes to Total Experts
Prompt #2 #personalization	0	0	0/13
Prompt #4 #autodidact	0	0	0/13
Prompt #8 #professors	0	2	2/13
Prompt #9 #disruptive	1	0	1/13
Prompt #12 #labor	2	3	5/13

their alignment. Those in agreement with the assertion pointed to the phenomenon's marriage of MOOCs and monetization in popular print media, while disagreement with the assertion sought to frame the question outside a directly economic paradigm, incorporating pedagogical arguments for MOOCs or against the current system. From the perspective of disagreement, it is the pedagogy of the MOOC that propels it; said participant E11, "I can't get past 'online cartridges.' My MOOC experience has been that the discussions with students, impersonal though the forums may be, have delivered some of the most meaningful learning that I have done in my career." Added participant E12, "Higher education needs a major disruption – the current model is neither effective or efficient." Those who disagreed with the notion pointed to popular media and historical precedent to argue for the affirmative. Said participant E7, "If the push is driven by pedagogy explain to me why Daphne, Sebastian, inter alia are so damn concerned with monetization?" Added participant E1:

> I can't help but think here of Raymond Callahan's book on Education and the Cult of Efficiency, because I certainly here invoked a lot of this idea that blended learning etc. will be more efficient. As Callahan points out, the push for efficiency in 20th Century education tended to be about financial decisions, not pedagogical ones. History repeats itself.

Participant E9 noted the divide between affluent education institutions and those struggling as a reason for the incongruence on the topic:

> Many decisions in higher education are being made on the basis of financial concerns, including some university commitments to online learning and MOOCs. Not all universities face those pressures, and universities like Stanford have the luxury of building online learning initiatives focused on pedagogy and research instead of financial

> pressures. The concern persists, as long as financial and sustainability worries persist, that online learning and MOOCs will aim to reduce costs by reducing faculty head count at universities.

This answer echoes not only the economics of the MOOC system but also the position of elitism in the development and implementation of MOOC courses throughout higher education versus its adoption across the university landscape, as addressed in prompts 10 *#imperialism* and 11 *#tierbased*. While Stanford professor Sebastian Thrun called his initial foray into online learning a "bold experiment in distributed learning," (knowitvideos, 2011), California Governor Jerry Brown contacted Thrun and asked him to help save California's higher education system (Young, 2013), and the initial system was rolled out at San Jose State University, a school in the California State University system that has suffered through recent budget cuts despite an influx of state funding through Proposition 30 (Budman, 2013). Whether the MOOC is an experiment developed by elite institutions or a model provided to those lacking financial stability was a sticking point in finding consensus on this topic.

The discussion of the MOOC as either a pedagogical sandbox or an economic panacea was also evident in discussion of prompt 9 *#disruptive*. The debate in Round 3 merged many of the discussion points where consensus was not found. As participant E1 noted, disruption relies on market-based technologies undercutting existing consumers:

> New tech comes in at the bottom of the market, serving consumers who were outside the market with a low quality product. Eventually the tech improves and displaces the old product. But I'm not sure if education fits Christensen's model, for a number of reasons, least of which because education is in many cases about prestige and not about something a cheaper product could displace.

On the opposite side of the argument, participant E11 stated, "[I] agree with 'disruptive technologies'…MOOCs challenge academics to better understand and deliver these benefits beyond tools." This is not only a discussion of the theory of disruptive technology, but it harkens to discussion points from prompt 5 *#publicgood* regarding the concept of education in society, prompt 10 *#imperialism* around the value of education based on institutional prestige, and prompt 12 *#labor* and the ability for technology to potentially replace human resources. While these prompts did not find consensus over the course of the study, their discussions merged into one another, showcasing the connected nature of many elements in the MOOC debate.

Summary

Over the course of three rounds of the Delphi study, four of 12 prompts found a consensus amongst the expert panel. Two prompts received affirmative consensus: prompt 3 *#data*, denoting a belief that learning analytics gained from MOOCs can help solve educational problems; and prompt 11 *#tierbased*, which stated that the MOOC was a model that could support providing various education services based on a cost hierarchy. Two prompts received negative consensus: prompt 6 *#democratization*, stating that the MOOC is a tool to both globalize and democratize education; and prompt 7 *#expertise*, which argued that the field of online education lacks experts.

Throughout the three rounds of the Delphi study, a number of themes persisted across questions and rounds: a discussion of learning as based in cognitive theories, a lack of shared definitions for education-based terms and jargon, a belief that the existing system is in need of solutions, and the role commerce and economics play at all levels of higher education. As prompt discussions evolved from Round 1 to Round 3, those topics which did not achieve

consensus merged into the discussion of other topics, to a point that many of the arguments made in one prompt were echoed in subsequent prompts, showing that the obstacles facing MOOCs are not isolated issues.

Chapter 5: Conclusions

In the 30 months since the popular inception of Massive Open Online Courses through Stanford University, the once-described bold experiment in distributed learning (knowitvideos, 2011) has grown into a full-scale phenomenon involving learning outcomes, pedagogy, educational history, economics, public policy, and sociocultural attitudes towards the purpose of education (Veletsianos, 2013a). The discussion of MOOCs within various media outlets is incongruent; the term sees a mass proliferation of use despite a growing number of stakeholders expressing confusion at the vast and varying definitions of and within the phenomenon (Rodriguez, 2012). This research study was designed to solicit thoughts and opinions from various expert stakeholders within the MOOC phenomenon in an effort to determine where consensus existed on matters of education, economics, policy and culture.

This chapter summarizes the research study and looks at important conclusions as evidenced by the data in Chapter 4. This is done by first viewing the conclusions in relationship to the proposed research questions, followed by a focus on overall trends within the topics of discussion. The chapter then looks at the implications for such results within the field of higher education, and discusses opportunities for further research.

Review of Findings

The Delphi study was framed by two research questions:

1. To what extent can experts in the MOOC phenomenon agree about its likely impact on higher education? Where do their opinions differ?
2. To what extent can experts in the MOOC phenomenon agree about its role in the historical, social and cultural shaping of higher education? Where do their opinions differ?

The MOOC's impact on higher education. Experts found consensus on two topics regarding the relationship between MOOCs and higher education: *#data*, a positive correlation to the idea that the MOOC learning model will help solve education problems through the culling and analysis of back-end learning analytics; and *#democratization*, a negative correlation to the idea that the MOOC is a globally democratizing initiative. Experts were unable to form consensus on four topics: *#videolecture*, a prompt debating the sufficiency of short video lectures and summative interactive quizzes; *#personalization*, a prompt regarding the meaning of *personalized learning* and its relationship to MOOCs; *#autodidact*, a prompt debating the ability for MOOCs to benefit learners outside a heutagogical theory of learning; and *#publicgood*, a prompt regarding whether or not MOOCs shift learning from a community good to an individual one.

The lack of consensus on four of the six higher education prompts in no way indicates a failure of the survey or expert panel. Rather, places where consensus is not reached in a Delphi are as important to the data as the spaces where consensus rises to the top (Martino, 1993). In this specific research study, the places where no consensus was reached were buffered by a bleeding of prompt topics into one another, which we will discuss in the *Implications* section.

Unique to *#data* was its point of consensus; it was the only prompt of 12 to receive a consensus in the first round of the Delphi study. The idea that data aggregation will help solve the problems of education is a popular opinion within educational technology, but less popular amongst the greater higher education population. Prominent faculty voices have raised concern about the reliance of MOOC hype on its generated learning analytics, most notably the Philosophy Department at San Jose State University, who in an open letter to Harvard and edX professor Michael Sandel express reservations not at the use of technology in the classroom but

at the use of a dominant and abstracted technology in lieu of localized and communal mixtures of technology and face-to-face learning (San Jose State University Department of Philosophy, 2013). This criticism matches the reservations held by other MOOC critics (Bady, 2013b; Rees, 2013a), who have identified the positive potential of technological improvements in learning but do not necessarily equate MOOCs with such potential. These arguments share a common theme: it is not technology that will better the learning experience, but the proper application of technology within the learning experience.

The immediate consensus on *#data* could be due to the sampling protocol determined by the researcher. As noted in Chapters 2 and 3, the MOOC is a new phenomenon comprised of various stakeholders at development, faculty, research, policy and critical levels. Therefore, expertise was defined in Chapter 3 based on early involvement with a number of congruent and tangential elements to the MOOC: research, development, course facilitation, publishing, etc. While the expert protocol determined by the researcher was designed to include voices both supportive and critical of MOOCs, the framework for expertise was highly dependent on a background in technology, more specifically educational technology. This prolific background in educational technology could likely have mirrored existing theoretical attitudes on the relationship between cognitive science and educational technology (Driscoll, 2005; Willingham, 2010).

As noted in Chapter 4, *#data* provided an insight into a discussion beyond the importance of learning analytics in the MOOC phenomenon: the relationship between the MOOC learning model and cognitive learning theory, and its place in modern discourse on how learning happens. On both the positive and negative sides of the *#data* debate, inferences to instructional design as driven by data analysis were paramount. In a statement designed to be critical of existing

MOOC practices, participant E3 implicitly supported the notion of solving educational woes through the analysis of back-end data: "Very few MOOCs truly incorporate student performance data to enhance the course in future iterations, but there will be market pressure to do so." Participant E12's statement furthered the argument: "The analytics provided by MOOCs (and other online learning) can provide a window into actual student performance – missing in most F2F and online learning today." Even a statement as antithetical to the MOOC as a back-end salvation as that of participant E6 assumes the problem is with the sample provided by a MOOC and not the methodology or theoretical lens behind cognitive analysis: "…the typical college student does not participate in MOOCs…so the data collected in MOOCs cannot be easily generalized to the whole population of college students easily."

Similar to how MOOC criticism does not have to be prefaced with a mindset that is anti-technology, educational technology does not have to be prefaced with a cognitive theoretical lens. Artificial intelligence pioneers such as Seymour Papert have long advocated for greater use of computers in the classroom. However, the manner in which these computers are to be implemented and applied to learning varies, as Papert's (1993) vision is one of creation and programming while the dominant MOOC paradigm supposes the transmission of content as technology's primary output. This creates a unique space where classroom educational technology practices merge with distance learning and online learning, three unique disciplines brought together in the adoption and proliferation of the MOOC. While the history of distance education involves the adoption and evolution of numerous learning theories (see Chapter 2), online education was borne of cognitive theory and largely remains a space for cognitive exploration. It is such a paradigm that led participant E14 to ask:

> Data may show that online learning as we have always presented it perpetually fails to produce meaningful learning. Will we then continue to modify online learning to make it succeed, or are we honest and brave enough to go back to the drawing board?

In a field dominated by cognitive theories of learning, does such a drawing board exist, or is there only space for algorithmic modifications?

If participant E14 is correct and we are failing to produce meaningful learning in online learning systems, an item for further consideration would be whether the larger societal discussion of online learning as happening today includes the 50+ year history of the innovation, or is entirely made up of MOOC discussion. Within much media discussion of the MOOC phenomenon, the terms *MOOC* and *online learning* are interchangeable; tech-based periodicals such as *Wired* (Ferenstein, 2013) and *FastCompany* (Chafkin, 2013) freely swap the terms, only paying brief attention to what they consider the limited history of online learning. This *MOOC = Online Learning* interchange was implemented by a number of experts the Delphi study, as was resistance to the impulse. One of the more notable voices of resistance to *MOOC = Online Learning* was participant E4, who noted on seven distinct occasions places where discussion within the Delphi study had freely exchanged MOOC for online learning or vice versa:

> What strikes me about so much of the discourse around MOOCs is how badly informed people are about online learning generally, tending to consider MOOCs as the only model of online learning, when this just isn't so…see my earlier comment about the lack of knowledge even among many of your panelists about online learning in general.

Participant E4, as well as others, found it difficult to debate online learning within the Delphi discussion because of the uncertainty of what *online learning* represented: was it a field of study developed and crafted over a period of 50+ years, or a synonym for MOOCs?

An agreed-upon definition of online learning was not the only space where experts tangled in terminology. As noted in Chapter 2, MOOC stakeholders have yet to create an adequate and accepted definition of MOOC, either as a system or a phenomenon. The three rounds of expert-mediated Delphi study showed that *MOOC* and *online learning* were not the only terms lacking consensus definitions: a number of domain-specific education terms were defined in vastly different manners by members of the expert panel. Terms such as *pedagogy, personalized learning*, *data, student, interactivity*, and even *open access* were used over the course of the research study by panel experts; however, the manner in which various panel experts used the terms lacked congruence or agreement with the consensus definitions from the field of education. It is interesting to note that terms brought from outside disciplines, such as business or technology, enjoyed a much greater agreement from the expert panel; there was little confusion as to what panelists meant when saying *freemium*, *tier-based*, or *disruptive technology*. Are education terms not fully understood by education stakeholders because of the lack of stakeholder knowledge regarding education as a discipline? Participant E4 discussed the difficulty of definitions in context of a lack of expertise in education: "Until we require faculty to be trained to teach, they will not be made aware of all the research there is into teaching and learning (including online learning) so we will continue to get ignorance." Or is education a profession more so than an academic discipline, and its stature as an Ed.D fits more with the JD of a legal professional, where practice changes based on the community and attitudes it draws upon? The latter definitive lens would fit with the ideas of participant E11, who in discussing *#expertise* stated, "The scale of online education coupled with the technologies for delivering content and interacting with students makes, for me, twenty-year-old research less applicable to today's MOOC ecosystem."

The MOOC's impact on society, culture and public policy. Experts found consensus on two topics regarding the relationship between MOOCs and social, cultural & political views of higher education: *#expertise*, a negative correlation to the notion that the field of online education lacks experts; and *#tierbased*, a positive correlation to the idea that the MOOC system provides opportunity for education providers to offer various education services at various price points. Experts were unable to find consensus on four prompts: *#professors*, a prompt regarding the MOOC as product of professorial meritocracy; *#disruptive*, a prompt debating the assertion that the MOOC model fits Horn and Christensen's (2013) notion of disruptive technology; *#imperialism*, a prompt regarding what constitutes elite institutions in the age of educational technology; and *#labor*, a prompt debating whether the impetus behind MOOC acceptance is pedagogical or financial.

The link between the MOOC learning model and its impact on economics was inescapable. Three of the six sociocultural prompts involved debating the role of capital, economics and monetization within the MOOC phenomenon: *#disruptive*, *#tierbased*, and *#labor*. The role of money in the MOOC phenomenon is echoed in the mainstream literature, where periodicals such as *Forbes* and *Wall Street Journal* house education reporters who often write about educational technologies such as MOOCs (Exline, 2013). The debate of economic realities in the MOOC phenomenon was spirited and resulted in some of the largest expert movements within the study (see Chapter 4). Experts believed consensus on *#tierbased* was achieved not because the panel agreed with the social or political implications of such a system, but only that such a system was possible; said panelist E8, "This is…a description of a possible business model associated with a technology. To agree with it as a scenario is not necessarily to

say that it's a great vision." Debate of how capital influences the social and political aspects of MOOCs, as noted in *#disruptive* and *#labor*, lacked the inherent pragmatism within *#tierbased*.

Many of the same thematic discussion points brought forward in the higher education prompts of the Delphi study were seen in the sociocultural & political discussion points, most notably in the *#expertise* section. While this prompt received consensus indicating that the expert panel believes there to be online education experts, consensus was not reached until Round 2, surprising for a study designed to engage online education experts in high-level discussion. Here we see difficulty in how experts define various education terms, most notably what is considered *data*. Is data the back-end informatics of an instructionally-designed learning management system (e.g., computer data), or is it a more generalized set of raw and coded variables interpreted and utilized based on a research instrument and context (a la qualitative data)? Within the expert responses to *#expertise* was a disconnect between the terms *research* and *data*; those who disagreed with the idea that there are no online education experts consistently pointed to volumes of research on distance and online learning, while those who agreed with the assertion that there are no online experts pointed to what they saw as a lack of data within the field of education. In Round 2 of the study, participant E10 said, "…MOOCs did not invent online learning and the large body of knowledge on online education is being ignored," while participant E8 stated, "As a non-expert, unsupported by data, I do not feel qualified to evaluate this statement." Here we see disconnect in defining a widely utilized educational term (data) where the competing definitions embody a cognitive theoretical lens (computer data) versus a more social constructivist lens (qualitative variables). The contrast between the two camps is clear in a response from participant E7, who stated, "I think there is a significant body of research on pedagogy, but frankly what does and does not apply to

technology-mediated instruction is unclear. The baseline of acceptance of educational theory, as any theory, is replication of results – to date there has not been a lot of replication, nor have we identified the relevant co-variant of causal factors." From this perspective, education as a research discipline cannot support viable educational theories from its communal or contextual roots, requiring a standardization of content and platforms in order to prove its validity through replication of results. While such an approach has been a catalyst for MOOC development (Agarwal, 2013), such a theoretical lens is antithetical to learning theorists and theories of the past 20 years (Wenger, 2013).

The role of critical theory in the Delphi study & results. This research paper utilized a critical theory lens to define the MOOC phenomenon, and employed critical theory in curating discussion prompts to engage experts in discussion on both intra- and inter-system levels. As noted in Chapter 1, viewing the MOOC as a phenomenon rather than a learning management system requires paying attention to the various stakeholders and relationships surrounding the higher education wheel, and critical theory is a valid perspective from which to view the rise of phenomena through relationships and power (McLaren, 1998). To that end, the researcher produced a literature review (see Chapter 2) designed to engage the dominant MOOC narrative in concert with negotiated and oppositional narratives, as well as utilize provocative discussion prompts to provide space for a discussion greater than those in the traditional MOOC narrative.

While the expert panel engaged freely on discussion topics pertaining to the MOOC model, pedagogy, employment and economics, participants were reticent to engage other relationship and power issues within the MOOC phenomenon. As noted in Chapter 4, prompts largely based around power relationships such as *#autodidact, #imperialism* and *#publicgood* saw little expert movement between Rounds 1 and 3. Moreover, many experts either ignored or

dismissed the power and relationship aspects of the prompts, choosing to focus on systems or question the assumption of relationship. This was especially noticeable in Prompt 10 *#imperialism*, which as written accused the MOOC model of being imperialist by nature and questioned the position of elite schools within the movement. In response, participant E2 said, "Anyone can engage and create their own MOOCs. Imperialism is a lazy argument." Participant E14 added, "It in not the MOOC provided by Stanford that is imperialist, it is Stanford and its marketing, its reach, its influence that is." These statements are built on factual accuracies, but the deny the sociocultural phenomenon pushing the MOOC movement through culture and policy. Rather than discussing the MOOC as a movement, experts chose to pull responses back to the MOOC as a system. Mass discussion of the MOOC does not differentiate between Stanford, its global footprint and the MOOC learning system; however, expert responses chose to create such distinctions in their dialogue.

A number or respondents to these prompts questioned the survey instrument rather than fully engaging the diverse prompts. Several panelists echoed the thoughts of Participant E20's dialogue, who regarding *#imperialism* said "…mixing too many ideas here. It's maybe imperialist (maybe not)." Rather than starting a dialogue to tease out the implicit and explicit relationships that have led to the proliferation of MOOCs across the globe, experts punted away the opportunity by questioning the complexity of the prompts, despite the prompts each being pulled from existing MOOC-related literature. These opportunities for a greater discussion, such as provided by *#imperialism*, were passed over in an effort to focus discussion back to systems or structures rather than relationships and power.

By abstracting MOOC phenomenon discussion from its sociocultural milieu to a sterilized systematic discussion assumes that the MOOC is a neutral technology. This attitude

was expressed by a number of Delphi experts who criticized the use of the MOOC but were careful not to criticize MOOC itself. Technology however, whether specific to a model or generalized as a notion, is not neutral (Stager, 2013), nor is it apolitical or ahistorical (Feenberg, 2003). This Delphi study endeavored to engage experts in a discussion including the sociocultural, political and historical relationships driving the MOOC phenomenon. While most experts chose not to engage these topics, their avoidance is not evidence of technology as a neutral system, but rather a space where dominant attitudes are paramount and negotiated or oppositional approaches have yet to gain voice or traction in mainstream or subculture debates.

Educational Implications

The MOOC-as-learning-model cannot be abstracted from the MOOC-as-sociocultural-phenomenon. Efforts to isolate MOOC discussion around learning objectives, evidence-based learning and instructional design do not render the MOOC as purely a learning management system; rather, it identifies the assumptions evident in the dominant educational paradigm and how those assumptions have helped to establish MOOCs as anywhere from better than the present system (Participant E10, 2013) to the solution for education (Friedman, 2012). Happenings within the development of the MOOC as a learning model are intertwined with the developments of how society and public policy view and handle higher education. The implications of the results of this Delphi study therefore address not only the manner in which MOOCs are designed or redesigned but how that design and redesign shapes and is shaped by society and public policy.

1. Computer science replaces education research & theory. In the time since the Delphi research study, prominent MOOC voices involved in development and political affairs have continued to advocate for educational solutions engaged within a cognitive worldview.

Coursera co-founder Andrew Ng recently promoted the book *Why Students Don't Like School: A Cognitive Scientists Answers Questions About How the Mind Works and What It Means for the Classroom*, in doing so advocating for the cognitive approach, saying, "[This is a] great book on applying cogsci principles to teach better. Loved this!" (Ng, 2014, para. 1). This exchange, passed along the social media platform Twitter to over 14,000 followers, marked some of the first recognized link to educationally rigorous learning theory, a change in the histories MOOC developers have heretofore shared with the world. Since 2011, those at the forefront of developing MOOCs have either linked their structures with very recent technological phenomenon such as Khan Academy (Vanderbilt, 2012), or avoided making a link to the history of education at all (Koller, 2013). The link between the artificial intelligence and machine learning backgrounds of the primary MOOC developers and the cognitive principles at the foundation of their academic disciplines now has been linked to existing learning theory literature. This link suggests MOOC developers believe the principles they employ for teaching machines are ideal principles for teaching humans.

Such developments might be ideal if, as Marvin Minsky put it, the brain is a computer made of meat (Minsky, 1982). The evolution of educational psychology, generations removed from the dawn of cognition in the 60s and 70s, has rendered cognitive learning theory archaic (Siemens, 2013a). While cognitive theory remains popular in computer science and among some educators, the work of educational psychologists and social scientists such as Jean Piaget, Etienne Wenger, and Bonnie Nardi have identified the limits of cognitive learning theory while using its strengths to create new theories of learning such as constructivism, communities of practice, and activity theory, theories accepted within education as more robust than cognitive theory (Wenger, 2013). A theoretical return to cognition thus creates a rift in the field of

educational research, where a focus on the MOOC phenomenon as a learning model substitutes the field of computer science for educational psychology theory. Moreover, the ahistorical attitude of the MOOC movement (Khan, 2012) implicitly invalidates prior education research. The end result is a whitewash of the field of education, where prior initiatives and research are discarded without consideration, and where the MOOC model and similar education initiatives can grow and thrive despite warnings from prior and existing education research.

The dismissal of education as a field of study and subsequent re-adoption of cognitive learning theory has already seen prominence in public policy debates. California Governor Jerry Brown, who as Governor is an Ex Officio Regent for the University of California system, recently pushed for the adoption of college courses designed to run without a professor or teaching staff:

> If this university can probe into “black holes,” he said, "can't somebody create a course — Spanish, calculus, whatever — totally online? That seems to me less complicated than that telescope you were talking about," referring to an earlier agenda item.
>
> After receiving pushback from UC provost Aimée Dorr, who delivered the presentation, that students are "less happy and less engaged" without human interaction, Brown said those measurements were too soft and he wanted empirical results. (Koseff, 2014, para. 3)

This development is not novel; the State of California has engaged in a number of cognitive-heavy policy initiatives over the past year, most notably the partnership of San Jose State University with MOOC providers Coursera and Udacity as well as the drafting of SB520, state legislation designed to promote and encourage the development and implementation of scalable online lower-level undergraduate courses. What is unique to the Board of Regents discussion is

Governor Brown's desire to remove the human element from courses entirely, shown through a belief that such an endeavor would be easier than *hard science* initiatives such as an astronomy telescope, as well as a desire to measure efficacy through back-end learning analytics rather than what Brown alludes to as soft educational measurements. The results of *#data*, in conjunction with recent public policy discussion, shows a societal shift towards learning analytics as preferential data, data derived from cognitive models of learning.

Despite the rich history of education as an academic discipline and field of research, education discussion and political movement throughout the MOOC phenomenon has largely been driven by outside voices. The rise in online learning notoriety over the last several years has largely come on the backs of what media outlets call celebrity educators (Friedman, 2012; Vanderbilt, 2012; Weber, 2011), individuals who have celebrated their lack of theoretical and pedagogical expertise within the education discipline (Khan, 2012; Thrun, 2012). In this world, the lack of immediate consensus on a MOOC topic such as *#expertise* makes sense, as the social space where education is debated has erased expertise and replaced it with education newcomers with a cognitive worldview and dependent on a specific brand of qualitative data to solidify their theoretical lenses. As these MOOC luminaries have been allowed to define the parameters of education's history and purpose, the results of their analytic evidence will likely be viewed and advertised as all-knowing rather than viewing education in the environmental and contextual terms of the rigorous education theory research of the past 25 years.

2. A lack of consensus on the purpose of higher education. Within a push toward fully automated college courses is an implicit definition of the purpose of higher education. As noted in Chapter 2, post-Enlightenment thought and debate has referenced the importance of education

for a citizenry, and the political manifestation of that thinking has included the creation of opportunities for citizens to attend higher education institutions.

The social structure of higher education has been unable to create a unifying call of purpose for citizens to engage higher education. This inability, in conjunction with the rising cost of attendance, has led to a cultural and political backlash against traditional higher education. Higher education authors such as Bennett and Wilezol (2013) and Kamanetz (2010) have published books advocating for individuals to join the workforce and/or become entrepreneurs rather than enroll in a higher education institution. This sentiment has gained political traction; at a speech designed to promote policy on education, President Barack Obama called for more young people to engage in skills and manufacturing trades in lieu of college, referencing the earnings of a tradesperson as superior to a person with a degree in Art History (Horsley, 2014). This line of thought was referenced in the Delphi study during the *#publicgood* prompt by participant E8, saying, "Blah blah blah tenured humanities professor sanctimony. Explain to me how you occupy the moral high ground when your students graduate $30,000 in debt and have no marketable skills."

The media and policy push away from college has yet to engage within society; a recent study on attitudes regarding the purpose of higher education notes disconnect between politicians clamoring for job skills and STEM subjects, and citizens who seen college as a space for engaging broader skills to provide a foundation for workforce preparation (Lederman, 2014). Societal beliefs could be due to the longstanding notion that a college education is a ticket to the middle class (Carnevale, 2012), while politicians could see the erosion of the middle class as a reason to focus on trades and skills either in a collegiate setting or outside of the academy (LeBlanc, 2013).

As tuition and expenses continues to rise, economics will grow as a factor in an individual's decision on further education and career choices. While no economists predict higher education costs to decline, there are several intervention strategies in discussion; in February 2014 both Oregon and Tennessee lawmakers discussed offering two years of free tuition to state graduates for enrollment in a state community of technical college. In Oregon, the cost of tuition would be repaid through graduates' future earnings (Cooper, 2014). In Tennessee the money would be covered by the state; however, in supporting the initiative, American Association of Community Colleges Senior Vice President David Baime noted the importance of the skills and trades one could learn in these two years in lieu of an expensive baccalaureate degree (FoxNews.com, 2014). The lack of vision and articulation in the importance of a college degree from higher education has allowed for skills and competencies voices to gain a foothold in the debate (Veletsianos, 2014), and without a clear vision or government financial intervention, the decision will be more difficult as costs rise.

Defining higher education as a space designed for job skills and employment opportunities marks an historic shift in how humanity considers the purpose of higher education. Advocates for education as driven for gainful employment stress the necessity of employability in today's evolving society (Participant E8, 2013; Thrun, 2013). Clay Shirky has utilized an historical argument to further this ideology, casting the growth of federal-based education initiatives between World War II and the Civil Rights Era as the Golden Age of Education, one which was unsustainable and that has been gone for 40 years and thus should be viewed as an aberration rather than the basis for judging education policy and initiatives (Shirky, 2014). Shirky's criticism has factual accuracies, but his lens fails to account for the historical push behind and purpose of education, one dating back to the Enlightenment and first advocated in the

United States by Thomas Jefferson (Wagoner, 2004). The purpose of higher education since the mid-18th Century has been to produce an intelligent, vibrant and critical citizenry, changes over history happening in how society defines *citizen* and not *education*. Since the Enlightenment, American society has broadened its definition of *citizen* from Anglo-Saxon landowner to include all genders, socioeconomic statuses and ethnicities. Defining political initiatives such as the G.I. Bill as an unsustainable golden age rather than the inevitable result of over 200 years of philosophical and cultural thought abstracts policy from its history and philosophy. Such thought provides an opportunity to advocate for initiatives that lessen the importance of education by casting the initiatives as far-reaching rather than expectant of historical progress. Rather than casting the period of federal intervention in higher education as the Golden Ages, a more accurate assessment would view the last 40 years of market-driven, neoliberal educational policy as the Dark Ages.

3. Economics as paramount in the MOOC debate. The role of economics in the MOOC phenomenon was highly evident throughout the Delphi study: discussion during *#publicgood*, *#democratization*, *#disruptive*, *#tierbased* and *#labor* incorporated or hinged on the role of public and private money within the educational system. These overlapping discussions noted the rising cost of higher education, the inability of state or federal governments to offset those costs, and the value of a degree in relationship to its financial cost to the student.

The Delphi prompt *#tierbased*, which received consensus in the second round of the study, was further vaulted when MOOC developer Udacity shifted its business model by focusing efforts on corporate partnerships as well as offering a paid version of the MOOC coursework (Thrun, 2013). According to Thrun, students may continue to access the content at

Udacity without charge, but paying customers can receive instructor feedback, career mentoring, and certification:

> Udacity's mission is to educate people so they can live a better life. In an era of declining employment opportunities in many traditional areas, we are empowering our students to acquire the necessary skills to excel in the high-growth tech industry. (para. 6)

This focus on career development in lieu of democratizing education is both a far cry from Thrun's initial vision of the MOOC as an agent of democratizing higher education for all (Thrun, 2012) as well as an economic indicator of a manner in which MOOC developers see an opportunity to create profit (Chafkin, 2013).

One place of economic agreement in the Delphi study was the expense to produce a MOOC, an expense that has yet to be mediated or accounted for in mainstream discussion or by MOOC developers. Participants E3 and E17 discussed the up-front costs of money and labor to create a MOOC, as well as the time commitment from the instructional team in facilitating the course upon its first week of course. Participant E19 furthered this discussion when utilizing prior MOOC knowledge to estimate the point where a MOOC can turn a profit: between its fourth and fifth iteration: "…even if the direst prediction of time overhead here is true, a 4x time increase for a version of a course translates to a course reducing the need for human resources starting in semester #5." This leaves the question of who will pay for the initial iterations of these courses. Much of this money has come from venture capital or institutional endowment: as of the 4th Quarter of 2013 Coursera had raised $63 million in venture capital (Helper, 2013), and Harvard and MIT invested $30 million each to establish edX (Kolowich, 2013a). While there is no record on how the investment into edX will be paid back, the history of venture capital through Udacity shows a desire for venture capital firms to recoup their investment even if it

requires a company pivot (Garg, 2013). Moreover, both Coursera and edX recently hired a CEO and COO, respectively, each with extensive experience in fundraising and the economic side of business operations (Hill, 2014; Kamanetz, 2014). For edX, the hire marks a shift away from the non-profit aspects of education and suggests greater focus on business and the global marketplace (Hill, 2014). For Coursera, the hire of former Yale president Richard Levin has implications both educationally and economically (Kamanetz, 2014), but the economic focus seems to remain paramount considering the Coursera search for a Director of Teaching and Learning, a search considered by Coursera to be paramount to the educational growth of the company (Koller, 2013), remains unresolved; despite its open call in early November of 2013, the company has yet to announce a hire as of May 2014.

On top of signature tracks and tier-based pricing, MOOC providers are making money from higher education institutions, both those they work for as well as those who solicit their content. Steve Kolowich (2013a) details the relationship between edX and its two institutional customer bases: schools who collaborate to build edX courses, and schools who solicit edX courses for their use:

> According to Mr. Agarwal, edX offers its university affiliates a choice of two partnership models. Both models give universities the opportunity to make money from their edX MOOCs—but only after edX gets paid.
>
> …Once a self-service course goes live on the edX Web site, edX will collect the first $50,000 generated by the course, or $10,000 for each recurring course. The organization and the university partner will each get 50 percent of all revenue beyond that threshold.

> The second model, called the "edX-supported model," casts the organization in the role of consultant and design partner, offering "production assistance" to universities for their MOOCs. The organization charges a base rate of $250,000 for each new course, plus $50,000 for each time a course is offered for an additional term, according to the standard agreement.
>
> Although the edX-supported model requires cash upfront, the potential returns for the university are high if a course ends up making money. (para. 6)

edX's most notable partnership is with the California State University system (Cheal, 2013), most notably San Jose State University, a school in the midst of budget issues so severe that the school sought to make $16 million in baseline budget cuts between the Fall 2013 and Spring 2014 semester, notifying department chairs of the change only a few weeks prior to the end of semester (Murphy, 2013). The California State University system is a publicly-subsidized education institution drawing taxpayer money from California residents, yet a school looking to cut $16 million from its budget is engaged in (getting the exact number from SJSU) of payments to Massachusetts-based edX for curriculum and course content. While the Delphi panel was unable to agree whether or not the institution of education is a public good, the economics of its public subsidy are a decreasing part of both the student tuition as well as the social discussion, as consumer tuitions and private venture capital gain more share and foothold for the future of the learning model.

4. Disagreement on definitions of education terms. The expert Delphi panel encountered a number of difficulties in finding agreed-upon definitions for education and research terms. Within the three rounds of discussion, terms such as data, open, student, pedagogy, personalization, sufficient and online education were used in divergent ways to

describe similar variables or phenomena. Historically some have argued that such disagreement stems from education as a moving profession basing itself within the sociocultural milieu of the time (Harvey, 2005), so definitions outside of an educator's primary discipline would be more negotiated than those within a field of study. However, experts had no problems finding agreed-upon definitions for the business and technological terms utilized in the study such as disruptive technology and learning analytics, terms also secondary to primary discipline.

Finding spaces of agreement or disagreement is predicated upon establishing the rules and parameters for a conversation. The Delphi study was designed to create a space for various experts associated with the MOOC phenomenon to freely discuss the social, historical, political and educational impact and future of the MOOC and higher education. This is the traditional method for a Delphi study: experts of a subject have a space to discuss a rising phenomenon amongst other experts, and the panelist design mitigates the levels of expertise so that conversation can begin at a high level (Linstone & Turoff, 2002). The experts chosen for this Delphi study are all influential scholars and practitioners tied to MOOCs, but the varying definitions provided by experts in wrestling with prompts and topics created a space where conversation was dedicated to shoring up vocabulary misconceptions rather than debating the topics. It is possible that the problems with terminology were in fact explorations and negotiations of dominant readings; however, a negotiated view of education as an academic discipline understands the discipline is a field whose expertise is often questioned, as evidenced by the prompt *#expertise*.

The success of educational concepts such as disruptive technology is predicated in part on the widespread understanding and adoption of the term in popular and critical media. The fathers of disruptive technology, Clayton Christensen and Michael Horn, have published

numerous books, research articles, blogs, conference proceedings, and media articles on the topic and its impact on a number of societal sectors, most recently education. This has resulted in the economic phenomenon gaining understanding and acceptance within a number of other institutions and societal structures, such as higher education, where it is difficult to extrapolate discussion of how the MOOC changes higher education without discussing disruptive technology (Horn & Christensen, 2013). This shifts the discussion of the future of education from an education-centric perspective to the perspective of agreed-upon terminology, such as the economics of disruptive technology, or the monetization of MOOCs, or the technology of automated learning. For education to remain a viable lens from which to engage the MOOC debate, the field must agree upon terms as basic as *data*, *open*, and *student,* as well as complex topics such as *pedagogy* and *personalization*.

Suggestions for Further Research

This study attempted to find points of consensus among experts associated with the MOOC phenomenon. In an effort to more clearly define the phenomenon, experts discussed elements surrounding the social, historical, political and educational aspects of the learning model, finding consensus on four and lacking consensus on eight. The broad aspect of the study highlights a number of places for further research.

The relationship between MOOC developers and cognitive science has largely gone unnoticed in critical literature. Moreover, recent cultural and political pushes toward cognitive-based assessment and data collection indicate a sizeable shift in social attitudes toward cognitive theories of learning and scientific inquiry. Further research should explore the theoretical lens that shapes learning theories borne of artificial intelligence and machine learning, using an educational psychology lens such as activity theory. Furthermore, researchers should utilize a

critical theory lens to analyze the language used in mainstream educational reporting, identifying terms and vocabulary based on learning theory association.

The experts canvassed for this Delphi study were reluctant to engage the discussion prompts involving the role of MOOCs and educational technology within society and cultural attitudes toward education. Looking at the MOOC as a phenomenon is a relatively novel approach to the subject, as most literature focuses on the learning model and its systematic elements. Further research should engage the MOOC as phenomenological and analyze its relationship to cultural and political changes in education as well as society-at-large. While critical theory provides a lens to view the MOOC as a phenomenon, researchers should engage other theoretical constructs while considering the MOOC as a political and social movement as well as a learning model.

The struggle of educational stakeholders to agree on the definitions of discipline terms and vocabulary is underrepresented in existing literature, especially in light of this research's findings that stakeholders can agree on definitions for interdisciplinary terminology. Further research should focus on the manner in which various educational stakeholders utilize common educational parlance in an effort to determine why fundamental terms are employed in vastly different manners by members of the community.

The relationship between MOOCs and economics is paramount in mainstream writing on the subject; however, research on the MOOC as a learning model has shown students are not apt to choose a MOOC education over the more traditional and expensive collegiate options (Lenox, 2014). While economics will continue to be at the forefront of the MOOC phenomenon, research should consider student attitudes towards online learning, scaled learning options, or MOOCs.

As noted in Chapters 2 and 5, educational technology has largely been a subset of education focused on learning models abstracted from society, implying a neutrality to technology that promotes its efficacy without any engagement with the psychological elements of the field (Feenberg, 2003; Sumner, 2000). While much of this paper has focused on the need for educational technology theorists and practitioners to engage in cultural and political discourse, critical theory must engage educational technology and provide a greater foundation of research from such a theoretical lens. The intersection of educational technology and critical theory is a rich space for research, and developing research questions to fill that space would likely be novel to scholarship.

Conclusion

While the speed with which the MOOC phenomenon gained traction in educational conversations was unprecedented, many educators and critics have expected the MOOC to follow the trajectory of previous installations of educational technology or policy change (Rees, 2013b; Watters, 2012). These arguments often cite failed institutionally-backed online initiatives such as Fathom or AllLearn, or evoke the technological theorem of Gartner's Hype Cycle (Neal, 2013) to reasonably account for the excitement while justifying a belief that the technology cannot meet expectations. For these educators and critics, the MOOC phenomenon is yet another example of organizations and businesses with a limited understanding of education and pedagogy failing to adequately provide solutions and inevitably leaving a mess for the establishment to clean up.

While the failures of prior online education efforts and subsequent reforms are important to consider as part of the MOOC phenomenon, the fallacies in this line of thinking are similar with the fallacies of other MOOC thought and debate; namely, addressing the MOOC as a

learning management system rather than a sociocultural phenomenon. CCK08, the University of Manitoba course credited with establishing the acronym MOOC (Rodriguez, 2012) was an experimental learning design whose breadth was substantially bound in the education discipline. The MOOC phenomenon borne of CS 271 includes the education discipline but also elite universities, multinational organizations, news media, public policy, commerce and venture capital. While educators may see the MOOC under increased scrutiny as a learning model, its footprint in society and policy continues to grow. The 30 months since CS 271 has not led to a trough of disillusionment about yet another failed EdTech endeavor, but a springboard into a new reality where EdTech is more firmly merged with the institution of higher education.

The results of this Delphi study show an interest in using this and other technologies and data formats to offer different and potentially better opportunities for learning, but they also show a reticence to engage the topic of education in a sociocultural manner, focusing instead on abstracting the institution of higher education from society and attempting to pinpoint progress. Higher education has long been an intersection of various stakeholders with varying understandings of the history and research in education, and MOOC stakeholders new to the historical and research-based aspects of the discipline have made missteps and encountered knowledge gaps consistent with prior iterations of educational technology and educational solutionism. The prior ventures were not supported outside by a web of power and sphere of influence, though, which has allowed the MOOC to enjoy an unprecedented rise in notoriety and popularity despite no research-based positive effect on the broken higher education system it purports to solve.

Where the MOOC has been successful is in shaping debate and setting discussion parameters outside the traditional higher education structure: redefining existing education

vernacular while establishing new terms for the field, offering cognitive style as the focal point of learning theory, focusing non-structural MOOC discussion on economics and inasmuch defining education as a product and private good, and labeling the purpose of education in the guise of careers and skills. From this perspective, MOOC success has less to do with course completion and more with renegotiating the manner in which society talks about education.

Despite the MOOC's primary thrust of power coming from its establishment of relationships congruent and tangential to the institution of higher education, experts and critics continue to discuss the phenomenon from a systematic point of view. This creates an environment of policy movement void of educational understanding, such as noted earlier in Chapter 5 where researchers celebrate the negotiable terminology that makes up the MOOC acronym while economic and political voices push forward with education proposals antithetical to the wide body of educational psychology research. Politicians and venture capitalists have shown little interest in engaging educational research when developing learning models such as the MOOC. It is up to educators to better define their stance and terminology both within the field and in the general culture.

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APPENDIX A

Phone/Email Script for Expert Solicitation

Dear (Subject),

My name is Rolin Moe, and I am a doctoral candidate in Learning Technologies at Pepperdine University's Graduate School of Education & Psychology. We met (insert place and time here) and discussed a number of topics, including the rise and impact of massive open online courses, or MOOCs. I thank you for taking the time to discuss this topic.

My dissertation research is a critical study of the educational, social and political impact of MOOCs. The majority of published MOOC research and layperson literature focuses on the structure of the MOOC in comparison to existing traditional and distance-based higher education, looking at how current practices will translate into future outcomes and solvency. Despite the rise of literature, numerous questions remain about the MOOC: a standard definition of the phenomenon, its viability as a higher education learning model, its place as a disruptive technology, and its impact on how society and culture view higher education. The purpose of this Delphi study is to understand the present impact of MOOCs on the social structure of higher education, and consider the potential future outcomes for higher education as now affected by the MOOC.

Because the MOOC is a recent phenomenon, expertise in the field is not subject-specific but rather made up of a number of disciplines: MOOC developers, MOOC professors, distance and/or online education scholars, political & governmental voices, and cultural critics who discuss the MOOC in mass media. This Delphi study will gather experts from these disciplines to engage in a controlled feedback discussion of the MOOC. The conversation will be asynchronous and your identity will be confidential both in the iterative discussion as well as in the research report, where you will be listed as an expert in the panel in the Data section but your responses will be coded and referred to as "an expert."

If you are interested in participating in this Delphi panel, please let me know and I will provide you with further information, such as an informed consent document, instructions on how the asynchronous conversation will progress, and a timeline of events. I expect this study to include three iterations of the instrument, each requiring close to 30 minutes of response. If you have questions, feel free to email any of the following: me (rolin.moe@pepperdine.edu); my dissertation chairperson, Dr. Linda Polin (linda.polin@pepperdine.edu); or Dr. Thema Bryant-Davis, the IRB Chairperson at Pepperdine (gpsirb@pepperdine.edu).

Thank you for your time, and I hope you will consider taking part in this exciting research project.

Sincerely,

Rolin Moe
Doctoral Candidate, Pepperdine University Graduate School of Education & Psychology

APPENDIX B

Informed Consent Form – Delphi Study on MOOCs

TITLE OF STUDY: The Evolution & Impact of the Massive Open Online Course

PRINCIPAL INVESTIGATOR: Rolin Moe

STUDY SPONSOR: Graduate School of Education & Psychology, Pepperdine University

INTRODUCTION: This document describes the research study that you are being asked to participate in and what the study will involve. Your participation is voluntary. Please read this document carefully and do not hesitate to ask any questions at any time. If you decide to participate, you will receive a signed copy of this document for your records. Also, if you decide to participate, you can change your mind at any time and withdraw from the study without giving a reason.

STUDY PURPOSE: The majority of published MOOC research and layperson literature focuses on the structure of the MOOC in comparison to existing traditional and distance-based higher education, looking at how current practices will translate into future outcomes and solvency. The purpose of this Delphi study is to understand the present impact of MOOCs on the social structure of higher education, and consider the potential future outcomes for higher education as now affected by the MOOC.

STUDY DESIGN AND YOUR ROLE: The Delphi method of research is a protocol designed to engage a number of experts around a phenomenon in an effort to spur discussion, forecasting and, in some cases, consensus through investigator-driven controlled feedback. As Massive Open Online Courses are a recent innovation in the fields of distance education, online education and higher education, the Delphi method provides experts an avenue to share their thoughts and opinions on a field with limited research and, in some cases, contradictory evidence.

As an expert in a professional field congruent to MOOCs, your role in the study is to provide your opinion as well as the rationale for that opinion in response to the existing norms, challenges and contradictions that make up the phenomenon. Through controlled feedback, you will be asked on several occasions to view the same question and anonymously engage other experts in the field in an effort to either gain consensus or solidify dissenting voices.

STUDY PROCEDURES: Participants in the Delphi study were chosen based on their experience and expertise in one of five professional designations congruent to Massive Open Online Courses: developers of MOOC systems and courses, MOOC professors, scholars in the field of online and/or distance education, political and government voices engaging the MOOC in upcoming policy, and media/cultural critics who have written extensively about educational technology and MOOCs.

All participants will be granted unique access to an online questionnaire regarding how MOOCs have shaped existing structural, political and social attitudes toward higher education. Access to the questionnaire will be asynchronous. Experts will be presented 12 statements, each a paraphrase of a quote from one of the following sources: research papers, media articles, expert

panels and conference presentations regarding MOOCs. The experts will read the paraphrased quotations, and take a stand on the statement by choosing one of the following the express your sentiment: "strongly agree," "agree," "disagree" or "strongly disagree"; as well as providing commentary to explain the rationale for agreeing or disagreeing with the statement. Upon completion of the questionnaire, the information will be sent directly to the investigator, who will assign the expert a unique ID number and code the data.

Upon data collection and coding, the investigator will amend the original questionnaire, adding the results of the Likert scale to the statements, as well as quotations from expert responses to serve as "touchstones" to identify prevailing and dissenting attitudes on the prompt. At this time, the experts will be again provided unique access to the amended questionnaire, which they will again read and respond to, this time utilizing the additional information to solidify or amend their responses. This cycle will continue until the investigator and the committee chairperson feel consensus has been attained on the research questions, or if consensus is not attained, expert feelings about the topic are solidified.

All data and informed consent forms will be retained for three years after completion of the study. At the duration of three years, data will be securely deleted, the only retention being the data assets coded by a randomly designated ID number.

RISKS AND DISCOMFORTS: There are no anticipated risks or potential harms beyond what can be expected in a normal educational environment. There are no extraordinary physical requirements, other than basic computer familiarity, such as navigating with a mouse and keyboard. Each iteration of the survey instrument will take between 15 and 30 minutes to complete.

BENEFITS: Despite its rising popularity in education circles and media commentary, the MOOC remains a relatively new phenomenon with little empirical research regarding any subset of the learning model. As Delphi studies are ideal instruments to define recent phenomena and address future potentials and concerns, this study could help solidify defining characteristics of the MOOC and identify its impact on higher education, both structurally as well as socially. Individual participants in the expert panel can benefit from the discourse both through identifying rationale for their beliefs as well as giving consideration to the responses and beliefs of other panel experts.

ALTERNATIVES TO PARTICIPATION: You may choose not to participate in the research study.

COSTS AND COMPENSATION FOR STUDY PARTICIPATION: There are no costs or compensation associated with participation in this research study.

CONFIDENTIALITY STATEMENT: Your name and professional title will be recorded in a section of the research report denoting experts on the Delphi panel. There will be no other references to you personally, and all references to your panel responses will be made generically, referring to "a panel expert." All reasonable protocols will be enacted to protect the confidentiality of the project records and your identity. Only authorized representatives of the dissertation committee at Pepperdine University (the principal investigator, Rolin Moe, and the committee chairperson, Linda Polin) will have access to research-related records; all information examined will be coded and kept confidential. As with any expert-based survey research, complete anonymity or confidentiality cannot be guaranteed.

OPTION OF WITHDRAWAL WITHOUT PREJUDICE OR RIGHT TO REFUSE: You can decide to drop out of this study at any time. Your participation is entirely voluntary. To withdraw from the project please inform the principal investigator, Rolin Moe.

CONTACT INFORMATION AND TELEPHONE NUMBERS:
If you have any questions concerning this research, you may contact me:

Rolin Moe (Principal investigator)
Graduate School of Education & Psychology
Pepperdine University
6100 Center Dr., 5th Floor
Los Angeles, CA 90045
310-359-3831
rolin.moe@pepperdine.edu

or my faculty supervisor:

Dr. Linda Polin
Graduate School of Education & Psychology
Pepperdine University
6100 Center Dr., 5th Floor
Los Angeles, CA 90045
310-568-5641
linda.polin@pepperdine.edu

If you have questions about your rights as a research participant, you may contact:

Dr. Thema Bryant-Davis
Chairperson of the Pepperdine University Graduate & Professional Schools Institutional Review Board
818-501-1632
thema.bryant-davis@pepperdine.edu

APPENDIX C

Introductory Video for Survey Instrument & Delphi Methodology

http://www.youtube.com/watch?v=auAc_TBDBK8

APPENDIX D

Delphi Survey Instrument – Initial Iteration

Introduction

Thank you for agreeing to participate in this research study regarding the manner in which MOOCs have shaped existing structural, political and social attitudes toward higher education, as well as the future of the learning model.

This research study is being conducted in partial fulfillment of the requirements for the Doctorate of Education in Learning Technologies at Pepperdine University. The purpose of this Delphi study is to understand the present impact of MOOCs on the social structure of higher education, and consider the potential future outcomes for higher education in a MOOC landscape.

All efforts and established research protocol will be utilized to keep your responses confidential. While your participation in this study will be noted within the research, data utilized in the report will be presented without signifier. Your participation in this study is voluntary. You are not required to answer every question, and at any time you may opt out of the research study.

You are going to see a series of prompts. These prompts are a paraphrase of research papers, media articles, expert panels and conference presentations regarding MOOCs. You may agree with part of an idea but not all of it; please use the comment box to discuss your thoughts and beliefs on the quotation in relation to the MOOC phenomenon. While some of these quotes have multiple ideas, the entire quote embodies existing sentiment in the field. Please comment on this.

A Delphi study is a consensus-building tool, and because of that feedback is integral to the iterative process. The Likert scale provides a basic touchstone to relate future feedback on, but it is the feedback that will allow opinions and beliefs to emerge, opinions and beliefs for the panel to engage in the subsequent iterations of the instrument. This exercise is not about drawing a line in the sand and defending it, but rather engaging the topic from your lens and seeing how other impressions help you to better define your thoughts.

Statement 1

Education through the use of short video lectures and online interactive prompts is a sufficient learning engagement for students.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 2

MOOCs do not provide personal learning. Personalization is business-speak for FAQ and customization, where two-way communication is almost non-existent and no one is known to anyone else.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 3

The data we gather from students utilizing MOOCs will help us solve student struggles in learning through redesigning the learning system and content modules.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 4

How can MOOCs solve the education crisis if they cannot benefit non-traditional university students (as evidenced by the Udacity/San Jose State University courses in the Spring of 2013)? MOOCs are great if you are an autodidact or hold a graduate degree, but if not…

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 5

Education, once a public good, is no longer. MOOCs re-imagine the system of higher education as spaces of individual accreditation and colonialist knowledge dissemination, rather than community spheres and spaces for knowledge creation and collaboration.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 6

MOOCs allow anyone anywhere to take coursework from the best universities in the world at no charge. It is not only a global education initiative, but a democratic one too.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 7

As of now, there are no online education experts. There are anecdotes, stories and ideas, but nothing supported by data.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 8

MOOCs challenge professors to be better. The great courses and pedagogues will rise to the top, and the average ones will have to get better or go home.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 9

MOOCs are a disruptive technology in education. Not only do they change cost and scale, but they change the purpose of higher education from what knowledge/competencies a student acquires to what a student can do with knowledge/competencies.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 10

To say the MOOC is exemplary because it provides the best instructors from the best colleges is an imperialist attitude. Why do Stanford, Harvard or MIT get to produce globalized authority?

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 11

The MOOC allows providers to offer tier-based education opportunities: Any customers my take a free course, others opt in for extra interaction with a tutor, some choose extra interaction with a professor, and a few take the course in-person. Each tier would require higher levels of cost to the consumer, but would include higher levels of service.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

Statement 12

The administrative and political push towards online learning and blended courses is not driven by an interest in pedagogy, but rather a restructuring of higher education that replaces human resources with online cartridges.

Please rank your association with this statement: Strongly Disagree, Disagree, Agree, Strongly Agree.

APPENDIX E

IRB Exemption Notice

September 27, 2013

Rolin Moe
Protocol #: E0913D01

Project Title: The Evolution & Impact of the Massive Open Online Course (MOOC)

Dear Mr. Moe:

Thank you for submitting your application, The Evolution & Impact of the Massive Open Online Course (MOOC), for exempt review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your faculty advisor, Linda Polin, have done on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations (45 CFR 46) that govern the protections of human subjects.

Specifically, section 45 CFR 46.101(b)(2) states:
(b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:

Category (2) of 45 CFR 46.101, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

In addition, your application to waive documentation of consent, as indicated in your Application for Waiver or Alteration of Informed Consent Procedures form has been approved.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a Request for Modification Form to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact the GPS IRB office at gpsirb@peppderdine.edu. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

Thema Bryant-Davis, Ph.D.
Chair, Graduate and Professional Schools IRB