A Review of the Literature

Background of Saudi Arabia's Policy and
Perspectives on MOOC Education

Any consideration of contemporary policy-maker perspectives regarding the educational efficacy of technology-enabled distance and MOOC education at the various levels of Saudi Arabia's educational system needs to be made in light of the historically unique development of the nation's educational system.

Prior to the discovery of oil on the Arabian Peninsula in the 1930s, a large majority of the population lived in tribal cultures with limited economic resources, no systems of formal education, with widespread illiteracy the norm. The discovery of significant oil reserves and its ensuing intense exploitation brought a rapid increase of export revenues into state coffers and provided the economic resources for accelerated infrastructure, social, and educational development.

Over the next three decades, the construction of maritime ports, communication networks, vast highway systems, power grids, and modern housing transformed much of rural as well as urban life. That said, the country's education system—virtually non-existent in prior years—was only first structured and formalized in 1930 under the Directorate General for Education. Focused largely upon Islamic religious studies, that initial effort to provide educational opportunities to the general population failed to keep pace with the unforeseen demands facing it.

Even twenty years later, and after King Abdulaziz bin Abdelrahman Al-Saud had decreed the establishment of schools and the recruitment of administrators and instructors as a national imperative in 1945, by 1950 the national literacy rate remained abysmally low with student enrollment in state-sponsored schools standing at less than 30,000.

Teacher qualifications continued to be vague if not non-existent, and teacher training was given minimal policy focus.

It was only with the renewed attention to the need for a coherent national education policy and an accompanying financial commitment to its complete implementation with the establishment of the Ministry of Education in 1953 that enrollment began an exponential increase, doubling in just one year. That financial commitment has been maintained through the years to the extent that the student population of 52,000 in 1954 now stands at more than 6,000,000; accordingly, the number of schools increased during the same period of time from just 469 in 1954 to nearly 30,000 schools today.

In 1957, King Saud University was established, and is now among 25 public universities and 27 private under the purview of the Ministry of Higher Education, which was created in 1975.

The study of Islam remains a core curriculum within the Saudi educational system, but the demands of a resource-rich economy with an increasing profile in the world community of nations requires increasing diversity in all courses of study and the adoption of improved instructional techniques. An expanding curriculum places demands not only upon existing facilities, but upon educational modalities and protocols.

Given that, there have been a series of National Development Plans that have driven enormous improvements in physical plants, student facilities, and teacher training. But those improvements have not been arrived at absent the challenges of ongoing maintenance, the need for constant expansion, the evolving quality, context, and content of course offerings, and the planning and implementation of new technological tools.

Early evidence of official awareness of the need for the adoption of contemporary learning technology came with the creation of the Ministry of Education's Audio-Visual Unit in 1959. There were entrenched cultural impediments to any shift in instructional methodologies, but the shift in teacher training emphasis from traditional instruction to a focus on educational outcomes under the guidelines of the Fourth National Plan in 1985 under the new Educational Development Department presaged an increased appreciation for and interest in the implementation of educational technology.

Few global societies have witnessed the adoption of internet technology over the past decade at the pace of Saudi Arabia. With a majority population of young adults, internet usage grew exponentially between 2005 and 2015, providing an active student population eager to engage in e-learning (Imran, 2012).

This rapid engagement with technology has driven distance education models toward two innovative imperatives: the individual flexible teaching model and the extended classroom model (Rekkedal, 2007. These are facilitated through online technology into both single-student and group models of collaborative learning, both of which provide for direct contact with instructors, fellow students, and information databases.

In spite of the increased acceptance of technology in education among some quarters, some academics stood firmly entrenched for many years in more "traditional" methodologies and protocols and remained been resistant to the adoption of any new tools that may be available (Alqurashi, 2009), including the use of the internet, distant-learning developments, and MOOCs as they pertain to certain curricula.

While acknowledging the "potential" value of online and distant education in a world of rapid technological change, concerns about the relevance of on-campus attendance at brick-and-mortar institutions and what may be the fading value of face-to-face student-teacher interaction have been an argument for the control and limitation of MOOC adoption across the educational spectrum.

Dr. Ali Abu Reesh has earlier pointed to the realities of "technophobia" that creates a passive non-interactive learning environment, as well as to the lack of training on the part of instructors. Supporting that contention are the administrative challenges of maintaining up-to-date technology and, according to Dr. Sameer Aljabri of Umm Al-Qura University's English Department, the paucity of "space assigned for extra labs." (Alqurashi, 2009).

The entrenched reactions of those initially resistant to the adoption of online and technological learning tools at the time may be considered as reflective of the challenges facing a generation of educators caught at a crossroads. Sufficient computer skills were, as recently as five or six years ago, a considerable impediment to developing and monitoring online curricula. Those with a history of instructional success and tenured professional standing have a natural aversion to change; why fix something that is not perceived as broken? And simple "technophobia" itself— wherein changes in environment and professional status may be perceived as possible in the face of unproven tools—has been a likely historical impediment to the adoption of the world of blinking cursors.

Additional impediments to the earlier successful adoption of technology-driven learning were apparent in the lack of understanding on the part of many

educators as to the benefits of distant online learning. Given that failure, the institutions within which those educators work routinely failed to provide the training and support required for the development of individual and staff fluency in the use of the available technology.

Those challenges to widespread acceptance of online education are considerable, but so, too, are the perceived benefits derived by students engaged in e-learning coursework. Among the most notable, according to Reesh, is "interactivity" allowing students a more active role in their own learning.

Increased student engagement appears to derive from the capacity for individual self-scheduling, the ability to repeat course modules and exercises, open access to materials, and online interchange and discussion with other enrolled learners (Alqurashi, 2009). There has long been discussion around the challenges of student engagement and exploration of information (Von Glaserfeld, 1990) pointing to the development of process skills and improved attitude toward learning through increased engagement and responsibility for individual outcomes, all of which can be reasonably attributed to the activities inherent in online "distant" learning.

Educational Perspectives of MOOC

As recently as 2014, the Saudi Arabian government publicly made the official perspective on the value of Massive Open Online Course education quite clear. They did so with an announcement issued by the Ministry of Labor for the Kingdom of Saudi Arabia His Excellency Eng. Adel bin Mohammed Fakeih of a MOOC of an initiative to provide "accessible, relevant, high-quality education opportunities for our citizens" with the aim of providing vocational training and educating skilled workers across a wide demographic that includes Saudi women, youth, the disabled, and those living in widespread rural environments (SPA 2014). Clearly, one sector of the government recognizes the potential of MOOC to develop and educate a technically-proficient workforce and to economically empower its citizenry and society as a whole.

This recognition flows from the Ministry of Education's declaration of its work as "a strategic investment" in the development of the nation's "knowledge economy" and the maintenance of its social and cultural stability (Al-Anqari, 2013). Among the initiatives under the purview of the Ministry is the National Center for E-Learning and Distance Learning. Established and guided by Dr. Abdullah Al-Megren, Ph.D under the auspices of the Higher Education Ministry, the mission and efforts of this group in the development and implementation of distant learning strategies under MOOC protocols is evidence of the acceptance of online education tactics and methodologies by national policy makers in the belief that "the future of education is the future of the nation and e-learning is the future of education," (Al-Anqari, 2013).

When he ascended to the throne in 2005, King Abdullah bin Abdulaziz Al Saud made the education of his subjects a prime focus of his reign, first providing scholarships to students for higher education abroad. During his seven-year reign, economic support of all educational initiatives throughout Saudi Arabia was increased by more than $30 billion, and has been responsible for the proliferation of college and university campus facilities as well as for the implementation of the country's first university allowing co-ed enrollment. Significantly with regard to the increased emphasis in the development of educational protocol and technology reforms, as recently as 2014 the government committed an additional $21 billion for the training of new teachers (Ross, 2014).

Challenging the progressive development of Saudi Arabia's educational reforms, however, is its tradition of gender separation in social, economic, employment, and educational realms. With the role of women in the kingdom long prescribed by traditional religious mores, it was only as recently as 1999 that women were provided access to limited higher education curricula. In spite of the fact that women today comprise a majority of the nation's university graduates, they are constrained to liberal arts and education majors; due to religious and cultural traditions research grants, scholarships, and permission to study abroad are rarely granted to women (Bruff 2013).

The product of this anachronistic cultural gender bias has produced a society built around "parallel institutions" wherein duplicate educational facilities and teaching paradigms have been the traditional norm. The cost of this infrastructure and the support systems required to manage it are neither inconsiderable nor efficient; they arguable fail to return the full potential of their financial and human investment.

With the objective of educating all of Saudi Arabia's students—including its female population—MOOCs arguably perpetuate the phenomenon of gender separation and "parallel institutions" and may only promise ongoing frustration in the country's efforts to develop an educated workforce able to self-support and capable of contributing to the overall national well-being. While MOOC may be available online in even the most remotely rural areas, there is the likelihood of ongoing isolation from fellow students and professors as well as the preservation of gender separation as the cultural educational norm, hardly conducive to the free exchange of ideas and improved learning patterns. This phenomenon has been long observed since Saudi Arabia's initial forays into "technological education" through the use of remote broadcast closed-circuit video coursework, which effectively maintained the gender separation status quo (Gais, 2014).

Given that reality, Dr. Azzam ibn Muhammad Al Dakhil, Saudi Arabia's Minister of Education, believes that working side-by-side with independent Saudi entrepreneurial efforts, the development of MOOCs offering basic coursework ranging from religious studies to biomedical engineering in a native Arabic language platform will be a step forward in providing learning opportunities to those currently outside of the traditional educational system.

There is a common apprehension among policymakers that MOOCs have the potential to create disruption of the current higher education paradigm (Alraimi, n.d.) . To date, that has not occurred, as Saudi Arabia's universities have only engaged MOOC as ancillary to traditional classroom and seminar protocols. The greatest expectations for MOOC currently is a positive influence upon enterprise and skills training with the product of that influence to be measured in primarily economic marketplace data.

There are, however, serious shortfalls in MOOC education identified by a range of policymakers (Hiltz 2005). Among them is the current state of Saudi Arabia's internet infrastructure and the range of individual access to those services. There is currently only 58% internet penetration in the country, with significant upload and download speed challenges faced by the large content loads of MOOCs, which leads to an imbalance of opportunity for general student population access. While MOOC registrations continue to rise in number, the percentage of course completions remains less than impressive Henson 2010). Current data indicates a worldwide completion rate of university level coursework using any of today's MOOC platforms at below 0.2%, indicating today's student generation may be "sampling" the tools but have not yet committed to ownership.

The fundamental question remains whether or not MOOC coursework is the equal of face-to-face learning in terms of efficacy. Just four years ago, there were approximately 150,000 students from more than 60 countries enrolled in MOOC. There is no argument that the 95% dropout rate of those enrolled far exceeds any such statistic shown in a face-to-face teacher-student instructional paradigm (Dahlstrom 2014). But the claim of efficiencies of MOOC suggests that a 5% completion rate (the only measure of success being a passing grade and completion certification) is significant if only in terms of numbers implied by that percentage at more than 7,000 students. Moreover, the worldwide acceptance of MOOC pedagogy appears dynamic and aggressive; in 2014, MOOC coursework enrolled 2,500,000 students from every developed nation on the planet (Sreenivasan, 2014).

According to data provided by Anant Agarwal, the MIT computer science and engineering professor who first offered his coursework online at no charge on an open

enrollment basis and who is now CEO of edX, a nonprofit learning enterprise currently offering free academic training provided by major universities, there is more to MOOC than simply a recitation of data and information; student engagement, interactivity, and feedback are at the core of the offering. He does, however, agree that MOOC is only a supplement to, and not a replacement for, face-to-face classroom instruction.

MOOC critics abound. Among them is the President of the California Faculty Association, who points to the lack of concern for "quality of education" in the face of faster, cheaper learning systems. Setting aside the undefined implication of "quality" or her potentially skewed agenda as a representative of California's higher education employees, she strenuously urges resistance to the temptation to look for "silver bullets" to cure educational budgetary shortfalls and challenges.

Those educators who have successfully employed MOOC technology to convey course material meet criticisms with equal levels of enthusiasm. In 2013, University of Massachusetts Professor Brian White reportedly replaced his entire lecture curriculum with MOOC instruction, and claims that it enabled his students to then attend his face-to-face instruction prepared with the fundamental concepts required for actual, engaged classroom interaction.

In their September 2014 study of the learning end product and efficacy of attending face-to-face instruction versus attending MOOC instruction in the study of Introductory Physics, Kimberly F. Colvin et al, the impediment of insufficient metric data that was earlier identified (Hollands, 2014) was addressed. Using two contrasting approaches to their analysis—pretest and posttest conceptual questions and an item response theory "ability" analysis—study administrators had an expectation that

freshman college students attending face-to-face instruction would demonstrate increased abilities week-to-week over their online peers that was simply not reflected in their data; there was no evidence of improved learning among the face-to-face classroom students relative to those attending only MOOC coursework. (Colvin, 2014). In their analysis of student performance data, Colvin et al point to the self-selective nature of MOOC students who are educationally self-motivated, older in age, with more years of college coursework to their credit than those freshman with whom they were compared. Like other MOOC curricula, the online dropout rate of the test group was substantial; while such factors likely fog data on a one-to-one comparative basis, the efficiency of the online protocol appears clearly demonstrated.

Among policymakers, there is growing appreciation for the unique challenges and opportunities provided by MOOCS (Bali, 2014). "Massive" and "open" by their very definition, MOOCS present to each enrollment session an unpredictable volume of students of equally unpredictable backgrounds and levels of pre-enrollment preparation. The problem this presents to course developers and online instructors is one of curriculum and subject matter design, as well as conducting coursework from a student-centered standpoint. The creation of a functional paradigm supporting interaction both among the students themselves and between the students—individually and as a group—with the instructor remains a complex structural and management challenge (Anderson, 2011).

Moving past the mechanics of course development, some express reservations regarding MOOC instructional and content quality. When course content is standardized to the lowest denominator of information required for subject area "knowledge," Stanford

University economist Caroline Hoxby suggests, student interaction with professors eliminates any exposure to nuance or judgment. Hoxby is also critical of the tendency to award degrees based upon MOOC performance as undermining the value proposal of an elite university education (The Economist, 2014).

There is no assertion among contemporary researchers that MOOCs fail to provide educational opportunities to those who may not otherwise enjoy the benefits of higher education or of skills development. In Saudi Arabia, because the two predominant MOOC providers allow access with zero financial expense to students and provide substantial curricula in Arabic, formerly formidable barriers of language, cost, geography, or individual scheduling are fading away. Educational policymakers, recognizing these advantages, and aware of the effective learning and skills improvement provided to those who complete MOOC coursework, are embracing the technology but are nonetheless faced with cultural and political concerns. Among those is the possible erosion of cultural identity and Muslim tenets brought upon by the adoption of MOOC courses designed and promulgated by Western educators. The rapid onset of MOOC adoption by American universities of high regard—Stanford, Harvard, MIT—and their close relationship with the entrepreneurs and engineers behind edX makes those concerns not entirely unreasonable.

Saudi Arabia's official state policy of creating widespread academic and vocational opportunity, and of enabling widespread access to learning tools via online coursework even for those with limited economic resources, is in itself an affirmation of the credibility assigned to the educational effectiveness of MOOCs. The fundamental potential of MOOCs to expose heretofore unreachable student populations—formerly

denied access to face-to-face learning opportunities for any number of reasons—to the tools of digital literacy and value-driven education currently outweighs concerns of possible online learning shortfall as compared to face-to-face traditional classroom learning. Students have been shown to learn as effectively online as in a classroom setting, and policymakers currently subscribe to those findings (Colvin, 2014). That translates into an ongoing commitment on the part of policymakers, despite the difficulties and challenges of implementation, to promote the further development of MOOCs for the educational, social, vocational, and professional advancement of the greatest number of learners.

Economic Perspectives of MOOC

It is reasonable to note the distinction between educational "efficiency" and "effectiveness". The absence of any profit motive on the part of public education in Saudi Arabia may provide less apparent impetus toward the development of MOOC, but that ignores the frequently subtle undercurrent of economics as either an impediment to implementation or as a desirable effect of implementation.

Because Saudi Arabia enjoys a unique domestic resource position as manifested by its ranking among global petroleum exporters, the country is in an enviable position to commit significantly to the widespread, intense, and accelerated development of MOOC. The question is whether or not policymakers are inclined to make such an investment outside of the traditional educational paradigm (Albalawi 2007). For MOOC to deliver its full economic potential in the labor force, brick-and-mortar institutions as well as private industry will need to recognize the value of such learning through formal accreditation and certification, which remain talismans of knowledge often given more weight than actual knowledge itself in the Saudi marketplace.

With King Abdullah's May 2014 commitment of more than $21 billion and his approval of a five-year plan to train 25,000 new teachers and create additional educational centers beyond the reach of the nation's existing universities, private entrepreneurial efforts to build MOOC platforms have surfaced (Gais, 2014). Among them, in 2013 the Arabic language *Rwaq* MOOC portal, developed by independent Saudi entrepreneurs Fouad Al-Farhan and Sami Al-Hussayen, began providing a range of distance-learning curricula that includes such disparate matter as religious studies and

biomedical engineering. Shortly after *Rwaq* went online, India's high-tech educational entrepreneur Anant Agarwal's edX partnered with Jordan's Queen Rania Foundation to build another Arab-language MOOC platform, *Edraak*, which today stands as edX's most significant national partnership.

An attempt to distinguish between the perspectives, policies, and incentives of Saudi Arabia's educators vis-a-vis those policymakers with other progressive interests provides a blurred picture. Because the nation's political leaders have recognized a gap between its workforce and a sporadically growing economy moving inexorably toward participation in an expanding technological global environment, they have for many years engaged the services of foreign workers living within the country. In a nation with a population approaching 28 million, nearly 6 million foreign nationals live and work in the country, with most of Saudi Arabia's specialized and technically trained labor force hailing from Western Europe and North America (CIA, 2015). The implementation of *Edraak* and *Rwaq* pursuant to considerable governmental investment is an indicator of awareness on the part of King Abdullah and his ministers of the need to better prepare the indigenous population to participate in an unpredictable and dynamic global economy.

Educational policies, then, appear on parallel tracks. Those outside of academia are prescribed and driven by a national leadership that recognizes the nation's women, youth, disabled, and rural inhabitants as a significant and under-utilized talent pool and potentially productive workforce. Saudi Arabia's Ministry of Labor—tasked with meeting the rising demand for skilled workers—manages the investment in the current national initiative to provide MOOC resources with an emphasis in practical employment skills development. The emphasis from the perspective of the Ministry of Labor is

outlined as an effort to "bridge the gap between education and employment, but there is evidence of some curricular crossover with MOOC initiatives in the purely academic sector (Ba-Isa, 2014).

Currently ranking 68th in GDP percentage spent on education, Saudi Arabia stands in the top third among global nations, and with 46% of its population under the age of 25 and 60% under the age of 30, when King Abdullah's established the Educational Development Department under the Ministry of Education in 1985, he demonstrably emphasized official awareness of the need to educate all citizens and prepare them for participation in the contemporary economy. In supporting official commitment to the utility of MOOC, Saudi educational policymakers, like those in Western Europe, subscribe to the economic value offering principles of "education access, experimentation, and brand extension" (Apelboin, 2014). There is also an awareness of the personal economic influence of MOOCs upon individual Saudi students engaged in secondary and university educational programs who currently spend considerable sums on individualized private tutoring services, "a common issue for families" (Brahimi, 2015). When students have 24/7 access to coursework in Arabic, learning is facilitated without incurring additional enrollment fees or other costs associated with protracted face-to-face learning modalities.

Educational policymakers do not have a blind eye turned toward the climbing cost of many degree programs and private school tuitions in the country. For those enrolled in private universities, tuition levels are on a par with those in the U.S., among the highest in the world (Deloitte, 2014). As the demand for advanced education and technical degrees increases, school fees do so as well. This becomes a factor for those expatriates

studying in Saudia Arabia who may be compelled to return to their native countries, thus creating the potential for a "brain drain" of skilled talent.

Additional negative economic consequences of widespread MOOC adoption are anticipated in the duplication of course materials currently taught in the traditional classroom protocol. The programming input of learning materials, testing modules, discussion, and grading protocols into a digitally-based MOOC system is not without significant cost (Riggan, 2012). Staffing and management requirements in a MOOC context creates additional cost affecting net value. Because of the unique nature of individual courses and levels of instruction, that cost is difficult to assess in a pre-implementation developmental stage. Economic analysis abhors a data-vacuum, and where the ever-expanding technological landscape is applied to dynamic student and learning requirements across various educational hierarchies, actionable-predictive data is elusive in the extreme (Zhu, 2012).

According to Hoxby, the threat to elite educational institutions worldwide posed by MOOCs is manifested on an intrinsically uneven playing field. She notes that universities—and those in Saudi Arabia certainly fall into this area of concern—offer a labor-intensive hands-on educational experience to students on a highly subsidized basis. When a student can study identical course content via MOOC with no significant cost to the student and with greater personal flexibility, the incentive to pay the cost of university tuition is dramatically reduced.

The university learning experience offers ancillary elements of socialization, community interaction, and personal contact with instructors, factors which may pale in the minds of students compared to cost savings and efficiencies realized by MOOC

engagement. This, of course, has the potential for eroding face-to-face enrollment and the consequent loss of student tuition revenues should MOOC accreditation be promoted on a par with the award of a university degree.

Additional economic impacts of increased access to MOOCs are perceived by many education policymakers as positive. Not the least of these is the potential for expanded course offerings to both the enrolled, academically oriented university student population and to those non-enrolled learners seeking only skillset certification in a specific discipline. Both *Edraak* (programmed and provided from outside Saudi Arabia but delivered in Arabic) and *Rwaq* are offered to all enrollees without cost. This is highly attractive to the individual student-user, but may certainly have an impact upon the nation's private schools where tuition fees support institutional operations and provide for instructor salaries.

Within the financial paradigm of Saudi Arabia's public schools and government-supported universities, any concerns of MOOC impacting revenues are moot. Given the low course completion rates common to MOOC, it is clear that online education does not currently threaten traditional face-to-face teaching paradigms where progressive learning occurs with objectives of degree attainment. In the near term, the potential for significant MOOC disruption of the current learning environment appears limited.

Where MOOC coursework is offered by standing institutions of higher learning, there is an economic impact projected insofar as academic leaders, professors, and instructors require both training and experience in the development, design, maintenance, and functional oversight of MOOC curricula (Zhu 2012). MOOC courses may be free to the individual student, but they are not "free" for those providing them. The purely

economic costs of implementation remain amorphous and dynamic, requiring additional institutional and Ministerial experience over time before any complete cost-benefit analysis can be made.

While the very "open" nature of MOOC and the flexibility it provides to educators and to students alike is believed by King Abdullah and his ministers to promise net positive economic benefit, and while the cultural, social, and political impact of providing dramatically improved educational access is not debatable, the fulfillment of those expectations may not be realized immediately.   Questions of learner motivation, teacher enthusiasm, and ongoing capital investment, as well as the evolution of Saudi Arabia's cultural realities will all have direct influence upon the ultimate computation of economic benefit from MOOC engagement.

Will MOOC be the path to improved education and economic promise in Saudi Arabia or lead to the brink of disaster? That answer will only be found in time.

References

Adham, R.S. *MOOCs as a Method of Distance Eduction in theArab World.* 2014. School of Systems Engineering, University of Reading, United Kingdom. Retrieved September 8, 2015. http://www.eurodl.org/?p=current&article=689

Al-Asmari, A. (2005). *The Use of the Internet Among EFL Teachers at the Colleges of Technology in Saudi Arabia*. The Ohio State University. pp. 30–31.

Albalawi, M. (2007). *Critical factors related to the implementation of web-based instruction by higher-education faculty at three universities in the Kingdom of Saudi Arabia*. The University of West Florida. p. 15.

Alqurashi, F. (2009). ELearning in efl: Problems and solutions. Makkah: Umm Al-Qura University. p.7.

Alraimi, K., Zo, H., & Ciganek, A. (n.d.). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education,* 28-38.

Anders, G. (2015). Coursera's online insight: short classes are education's future. Retrieved February 3, 2015, from http://www.forbes.com/sites/georgeanders/2013/10/10/courseras-online-insight-short-classes-are-educations-future/

Ba-Isa, M. (2015). Saudi eLearning portal to bridge the gap between education and employment. *Saudi Gazette.* Retrieved September 16, 2015. http://www.saudigazette.com.sa/index.cfm?method=home.regcon&contentid=20140806213747

Bali, M. *MOOC pegagogy: gleaning good practice from existing MOOCs.* MERLOT Journal of Online Learning and Teaching, Vol 10, No. 1, March 2014. http://jolt.merlot.org/vol10no1/bali_0314.pdf

Brahimi, T. and Sarirete, A. (2015). Learning outside the classroom through MOOCs. In *Computers in Human Behavior, (in press)*. doi:10.1016/j.chb.2015.03.013. Available: http://www.sciencedirect.com/science/article/pii/S0747563215001995 [Accessed 2-5-2015].

Bruff, D. O., Fisher, D. H., McEwen, K. E., & Smith, B. E. (2013). Wrapping a MOOC: Student perceptions of an experiment in blended learning. *MERLOT Journal of Online Learning and Teaching, 9*(2), 187-199.

Colvin, K.F., et al. 2014. Learning in an Introductory Physics MOOC: All cohorts learn equally, including an on-campus class. *The International Review of Research in Open and Distributed Learning.*, 2014. http://www.irrodl.org/index.php/irrodl/article/view/1902/3009

Dahlstrom, E., & Bichsel, J. (2014). ECAR study of undergraduate students and information technology, 2014.   Retrieved February 5, 2015, from https://net.educause.edu/ir/library/pdf/ss14/ERS1406.pdf

Data collection methods. (n.d.).   Retrieved February 1, 2015, from http://people.uwec.edu/piercech/researchmethods/data%20collection%20methods/data%20collection%20methods.htm

de Waard, I. (2015). MOOC factors influencing teachers in formal education. *Revista mexicana de bachillerato a distancia, 13*. Retrieved from Academia.edu website: https://www.academia.edu/10371139/MOOC_factors_influencing_teachers_in_formal_education

DeBord, K. A., Aruguete, M. S., & Muhlig, J. (2004). Are computer-assisted teaching methods effective? *Teaching of Psychology, 30*(1), 65-68.

Gais, H. (2014). *Saudi Arabia gets MOOC'd up*. Retrieved September 9, 2015. http://america.aljazeera.com/opinions/2014/9/saudi-arabia-massiveopenonlinecoursesgendersegregation.html

Heidebrink, A. (2013). How can MOOC platforms be more dynamic?: A comparison of major MOOC providers.   Retrieved January 27, 2015, from http://moocnewsandreviews.com/can-mooc-platforms-be-more-dynamic/

Henson, K. T. (2010). Curriculum planning: Integrating multiculturalism, constructivism and education reform (4th ed.). Long Grove, IL: Waveland Press.

Hiltz, S. R., & Goldman, R. (Eds.). (2005). *Learning together online: Research on asynchronous learning networks*. Mahwah, NJ: Lawrence Erlbaum Associates.

Hollands, F. M. & Tirthali, D. (May, 2014). *MOOCs: Expectations and reality. Full report.* Center for Benefit-Cost Studies of Education, Teachers College Columbia University. Retrieved September 9, 2015. http://cbcse.org/wordpress/wp-content/uploads/2014/05/MOOCs_Expectations_and_Reality.pdf

Lucas, G. A word from George Lucas: Edutopia's role in education.   Retrieved January 28, 2015, from http://www.edutopia.org/word-from-george-lucas-edutopias-role-in-education

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.   Retrieved February 1, 2014, from https://www2.ed.gov/rschstat/ eval/tech/evidence-based-practices/finalreport.pdf

Ramirez, M. S. (2014). *Guidelines and success factors identified in the first MOOC in Latin America.* Paper presented at the 6th International Conference on Education and New Learning Technologies, Barcelona, Spain.

Riggan, M. *Between efficiency and effectiveness: evaluation in for-profit education organizations.* 2012. American Enterprise Institute.

Ross, J., Sinclair, C., Knox, J., Bayne, S., & Macleod, H. (2014). Teacher experiences and academic identity: The missing components of MOOC pedagogy. *MERLOT Journal of Online Learning and Teaching, 10*(1), 57-69.

Saudi Arabia approves $21 bln five-year education plan -SPA. (2014, May 19). Retrieved September 7, 2015, from http://www.reuters.com/article/2014/05/19/saudi-education-idUSL6N0O53HU20140519

 von Glasersfeld, E. *Radical Constructivism: A Way of Knowing and Learning.* Studies in Mathematics Education Series: 6. Retrieved September 10, 2015. http://files.eric.ed.gov/fulltext/ED381352.pdf

Zhu, A. *Massive open online courses: a threat or opportunity to universities?* 2012. http://www.forbes.com/sites/sap/2012/09/06/massive-open-online-course-a-threat-or-opportunity-to-universities/