Emerging Role of the Instructor in the Online Education Paradigm

BHASKAR RAJ SINHA[1], ELLIE KAUCHER[2], PRADIP PETER DEY[1] AND
MOHAMMAD N. AMIN[1]
[1]School of Engineering, Technology and Media
National University
San Diego, CA 92123
USA
[2]Pacific Oaks College
Pasadena, CA 91103
USA
bsinha@nu.edu; ekaucher@pacificoaks.edu; pdey@nu.edu; mamin@nu.edu

Abstract: - Online education is an emerging paradigm with enormous potential and challenges in this multi-model education environment. It is extremely flexible relative to the traditional onsite educational system which is rigid, time-constrained and one-size-fits-all mode of delivery.This emerging online education paradigm can be described by a number of highly desirable best practices that makes learning effective and permanent. Creation of the content and the use of technology are two key elements, and the instructor can make this a success by understanding his or her new role and how and what to deliver to promote and encourage self-learners. Success or failure of online education depends on understanding these best practices and their proper implementations in the creation and delivery of the content, with the potential to make online education as effective as, or more effective than, onsite in-person traditional education.This paper describes the emerging important role of the instructor in this environment where learning happens, and the ramifications of this new instructor's role on the changing education paradigm.

Key-Words:- Adaptive education, Big Data, learner centered paradigm,MOOCs, online learning technology, self-learning and virtualization.

1 Introduction

How does learning take place? Is the teacher somehow instrumental in getting this to happen? The traditional established school of thought suggests that the teacher makes learning happen. This is based on theories in the literature [1]that have emerged over the last century. These theories fall into one of several categories. Behaviorism perspective founded in the early 20th century by John B. Watson is based on stimulus response [2], and suggests that behavior is caused by external stimuli, and not by the internal mental states or consciousness. Based on this, learning may be reinforced by praises or punishments. This paradigm was effectively replaced by the cognitivist paradigm founded in the 1960s by Noam Chomsky [3]. Here, learners are viewed as information processors who are not programmed to merely respond to external stimuli; rather learners are rational beings whose actions are a result of thinking. Another paradigm, the constructivism paradigm, was proposed by John Dewey, Jean Piaget, Jerome Bruner, Lev Vygotsky and others

[4]where learners are viewed as information constructors who continuously form their own representations of reality, where new information is connected to and understood based on prior knowledge. The final existing paradigm mentioned here is the humanism paradigm founded by Abraham Maslow, Carl Rogers and others. This is based on the idea that learning is a personal act to fulfill one's potential. It is student centered and personal, facilitated by teachers, with the goal of developing self-actualized people in a cooperative and supportive environment [5-6]. Understanding and practicing these theories the instructor today works with the learner and makes the learning take place.

Availability and use of technology today has opened up enormous potential in teaching. Online course design gives instructors the opportunity to make the content more personalized, where the learners can work at their own pace, thus removing the time constraint in the learning process. This research suggests that the ability to reflect and think critically is a powerful practice for the students to

learn. This needs to be promoted and encouraged. Course content needs to be designed to assist and help learners reflect and think critically. Currently, online education can be characterized by a number of highly desirable best practices, and promoting learner reflective and critical thinking is an important practice to help the learners understand the content. Success of online education depends on these best practices and their proper implementation, with the potential to make online education as effective as, or more effective than, onsite education. This paper describes the potential of promoting learner reflective and critical thinking skills and examines its effects on the emerginginstructor's role.

Today's available and improving technologies are introducing a new paradigm shift in learning. It is enabling us to understand the power of learner reflection and critical thinking without the time constraint inherent in the face-to-face classroom learning environment. Theclassroom-based education restricted by time, space, and cost has made it difficult, if not impossible, for over a billion people worldwide from having access to quality education[7-8].The internet and other technologies are helping us deliver materials and information by alternative methods for online education, and this is changing the concepts of time-space-cost oriented education. These benefits hold great potential and new opportunities for online education that can create a more universal approach to teaching and learning. The one-size-fits-all teaching model where all students are expected to learn the same way is no longer necessary. Sir Ken Robinson, in his TED talk "Bring on the Learning Revolution", suggested that a major transformation is required in the way we teach [9]. We have the opportunity and the technology, and now the challenge is to implement this transformation.

Minimally Invasive Education (MIE) was introduced by Mitra in 2000 [10].This is a pedagogic method, deriving itsname partly from the medical term 'Minimally Invasive Surgery' [11-13]. The concept of MIE was formed over time,based on observations and educational experiments conducted at the National Institute of Information Technology(NIIT), India[10].The observation was that groups of children learnt to use computers on theirown, irrespective of where they were. If computers are provided to students in a safe, public location, this learning will happen.This method of acquisition of knowledge does not depend on thepresence or the availability of schools or teachers. Also, this issignificantly less expensive thantraditional methods of computer education.

Therefore, in thosecircumstances where schools and teachers are absent, MIE learning stationsare an adequate substitute. Countries, cities or locations hit by natural disasters or war, or places affected by economic or social problems, are candidates to benefit quickly and reliablythrough such self-learning methods[12-14].

This research focusses on variousaspects of this new paradigm shift and the emerging role of the instructor in this environment. This is based on the fact that online education has no time constraint and the learner has the opportunity to reflect and think critically to understand the concepts at his or her own pace. Furthermore, group discussions promote reflective and critical thinking and the available online technology gives us the elements that enable creating geographically dispersed groups. This learner reflection and the skill necessary to think critically needs to be encouraged and promoted by educators, content providers and facilitators, thus enabling and encouraging learners to take responsibility for their own learning.

2 Opportunities in the New Paradigm

Technology has created, and continues to create, enormous opportunities in education. Critical thinking encompasses a set of thinking and evaluation skills with the objective of reaching some desirable outcomes. Reflective thinking, on the other hand,involves the process of making judgments about what has happened. Reflective and critical thinking is critically important in encouraging learning during problem-solving situations asthis provides learners with an opportunity to pause and evaluate alternatives and also think about how they actually solve problems and how analternative is appropriate for achieving their goal. Encouraging learners to think about what and how they are learning can promote understanding.

Creating online learning opportunities that include self-assessments and self-evaluation are some ways to support reflection and critical thinking.This section describes the main opportunities that the online technology offers that may be used by the instructor to promote reflection and critical thinking in learners.

2.1 Sharing Abundant Resources

Technology has brought us an unprecedented ability to share resources for learning. Peer reviewed teaching and learning resources are available for

free in most disciplines and can be found directly on the internet. An excellent example is the Multimedia Educational Resources for Learning and Online Teaching at http://www.merlot.org. Another popular site is the Khan Academy at www.khanacademy.org, started by Salman Khan, containing thousands of short video lessons on varied topics. Harvard University has produced a collection of online academic and learning resources with the goal of making educational content available to a global audience.

Although creating and distributing content has become significantly easier and more efficient, the challenge for educators and content providers now is to include the most appropriate and useful material in their online courses to avoid information overload. These materials will enable students to learn topics in the most effective and learner specific manner. Learners today are increasingly tech savvy and expect information to be available on different platforms. The ability to browse and learn on their own has become a growing expectation for many digital students. Lastly, making the learning process interesting and the learning more permanent has become the goal for many online courses.

2.2 Technology Based Education Platform

Availability of technology is playing an important role in creating opportunities in online education. In addition to desktops, laptops, internet, tablets, cell phones and other products and services, learners today have easy access to the cloud technology, virtual classrooms, virtual machines, simulators, emulators, and other products that are enabling learners to try new concepts, not only in a theoretical form, but also in a hands-on learning modality. Students are able to validate their solutions, try innovative methods and confirm their theoretical conclusions with immediate feedback in a very non-threatening environment. This encourages creativity and thinking out-of-the-box, and that encourages reflection and critical thinking.

Virtual instruction is a new form of pedagogy which is creating a desire to learn amongmore and more learners. Social media adoption, combined with the Web capabilities is bringingnew and exciting capabilities to the future of online education. Working with Big Data is slowly but surely becoming a value-add for learners in this education platform. In addition, having access to Massive Open Online Courses (MOOCs) has opened up more opportunities for learning. The emerging and important task now is the careful

selection and use of the appropriate technologies in such a way as to avoid information overload for learners.

2.3 Availability of Content and References

Access to education has always been a challenge for students with disabilities. The readily available online instructional materials have created new opportunities for accessibility in higher education. However, despite the rising numbers of students with disabilities in higher education, colleges and universities have not ensured accessibility of online learning environments for all students [15]. The encouraging news is that this availability of learning experiences and content for learners who cannot or choose not to attend face-to-face classes is increasing. Federal law, including the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, requires that university programs and activities be accessible to qualified students with disabilities. Specifically, Section 504 of the Rehabilitation Act [16] states that public entities receiving federal financial assistance, which include colleges, universities, or other postsecondary institutions, cannot exclude qualified individuals with a disability from the participation in or benefits of programs and activities on the basis of their disability. As academic institutions become more digital, accessibility of educational sites becomes more important. The U.S. Department of Education's Office of Civil Rights (OCR) has stated that accessibility requirements apply to instructional materials provided online as well as in print. The OCR has issued many legal opinions concerning accessibility and higher education suggesting that colleges and universities have a legal obligation to meet accessibility standards [18].

Given the above, the online education system has the unique opportunity to make the environment accessible to more students and improve their learning experiences.

2.4 Quick Feedback to Engage Learners

Timely feedback helps to improve learner engagement. In a study by Orso and Doolittle [19], the authors identified communication/availability and feedback as the two primary characteristics that students felt were important in their online experience. They needed frequent, timely communication and fast feedback on their assignments, quizzes, email questions, etc. This kept them engaged and interested. In online classes,

instructors have the ability to handle and work with more students while maintaining learning quality.

But even with more students, the important tool that technologies have contributed in the education field is the ability to get back to the learners faster with answers to their email questions, grades, evaluations, etc. This has created a win-win situation where more learners are being educated and the student experience is improving. As more technologies become available it is expected that this positive aspect of online education will improve further.

2.5 Affordability for Many

An unprecedented growth in online education providers has created strong competition among them. This is bringing down prices and raising the quality of online college course contents. Traditionally, online courses have been designed primarily for working adults, but now younger students in increasing numbers are also moving to this educational mode. Important observation and a driving force is that in these difficult and uncertain economic periods, many young adults are seeking employment and, on the side, are evaluating their options to continue their education online.

This is a significant opportunity for online educators to tailor their offerings to this demand. Educational organizations can make the process of creating and distributing content more efficiently and be flexible by utilizing the latest shared resources and communication technologies. These resources and innovative technologies can reduce the cost further and make education accessible to a wider geographically dispersed audiencein areas that had limited access to quality education in the past. The MOOCs technology and platform, a recent development aimed at unlimited participation and open access via the internet, is the first step in this direction.

3 Instructor's Role in this Paradigm

The instructor needs to promote learner reflection and critical thinking. The role of the instructor in this new environment is not necessarily to 'make learning happen', but to create an environment and 'let learning happen' [10-13]. This is a radical shift from the traditional role. The course content must encourage learner reflection and critical thinking at each learner's level of understanding. Students today are tech savvy and are capable of getting information they need. The ability to browse and

learn on their own has become a growing expectation for many digital learners. Courses should be designed with content and questions that guide the learners in the right direction and make them reflect and think. Create open-ended questions that learners can explore; reflect and think critically by applying the concepts that they are learning. This makes the learning process more interesting and the learning more permanent.

3.1 Create Content toPromote Reflection

Course Learning Outcomes (CLOs) should be developed that are measureable and contain assessment criteria. These are important because they inform the students the expectations and how these expectations are to be measured. Also this enables students to reflect and think critically to achieve the required outcomes. Numerous educational technologies and course management tools are available for online teaching, but not all of these technologies are good matches fordelivering the content or for the learner. Thecontent shouldencourage the technologythat matches the course objectives.To accomplish this, course planning and overall content framework should be completed before selecting the technology and course management system[20]. The contentneeds to contain resources, applications,examples, and links to relevant and current events that are easily accessed from the student'slocations. Given the existing online resources, there is no need to re-invent. Sources such as MERLOT (http://merlot.org), Khan Academy (http://www.khanacademy.org), Teacher Tube (www.teachertube.com) or YouTube (http://youtube.com) will improve the content significantly to promote reflective and critical thinking.

3.2Help Learner Manage Time

One of the items on the list of best practices is for the content to be organized to promote and encourage learners to manage time effectively and productively. Organization is the key to getting this done. The course site and/or the outline should clearly set time limits on instructor availability, discussion times and feedback times. Instructors may feel overwhelmed if they feel they must be available 24/7. Instructors should communicate at the beginning of the course when they will be taking time off. Availability of a teaching assistant will help, and if possible, encouraged. Knowing the

availability of the instructors and their individual schedules will encourage the learners to reflect on their own and think more deeply about their own learning process. Creating lesson plans for individual modules is recommended. Getting familiar with and using available technologies for content distribution, student submissions, grades, and other technological operations are becoming standard practices. Becoming familiar with these tools and applications, instructorsare more organized and this also helps learners to manage their time effectively. In addition, educators and content providers need to become familiar with new technologies as a part of their normal teaching responsibilities [21].

3.3 Create Content for Diverse Groups
Online education is becoming increasingly more global and used by learners from different categories. As the online content is developed, the content creator must design the course for target students with a broad range in ability, learning style, languages, age group, work experience, time commitments, and other personal circumstances. Individual students must be recognized for their unique needs or learning preferences. Technologies can be used in sufficient variety and levels of engagement to reach the greatest number of learners with greatest impact [22]. This will help all students access, use and reflect effectively, thus helping in the learning process and student experience.

3.4 Designs for Frequent Interruptions
Learners may be engaged with the course material at multiple times and over multiple sessions creating a stop and start affect that needs to be addressed in the content design. Course creators should be aware of and design accordingly so that students experience the ability to interact with smaller pieces or sequences of material so they can continue to make effective use of the asynchronous learning experience [23-24]. By packaging data in small sequential lessons or learning activities, course designers provide a vehicle for the occasionally connected student (OCS) to engage and reflect in small steps, thus proceeding to the next step only after the previous step is reflected upon. Additionally, there is the opportunity for non-linear content where CLOs are demonstrated in non-sequential activities that can be utilized by students in no particular order [25].

This non-linear approach increases engagement by allowing the learner the freedom to choose content in their own order of interest. This also encourages the learner to reflect and take responsibility of the learning process.

3.5 Activities to Promote Critical Thinking
A good closing activity for the coursethat encourages critical thinking is important for making the learning more permanent. This could be in the form of a project or a final discussion that covers most of the topics to which the learners have been introduced. This encourages the student to reflect upon the relations between the different concepts that the students have learnt and helpsmake learning relevant. Often the course designer should be explicit in the relationship between course materials and the CLOs for the course[26]. Additionally, course content should map activities in the course to the Program Learning Outcomes (PLOs) giving the student the opportunity to think of how each course activity relates to the goals of the degree and the practice of the profession [27].By connecting the theoretical and the practical elements of a course through a well-constructed closing activity the online students begin to think critically of activities that may seem purely theoretical but are actually preparing the student for the real world scenarios they should expect in the marketplace [28]. Scholarly research for online students also promotes this reflection about the practice and the pragmatic demonstration of real world skills.

As online students are commissioned to uncover converging and divergent discourses in the scholarly literature, they are forced to examine the gaps between their own workplace experiences and the theoretical possibilities for improvement outlined by these publications [29]. Therefore, closing activities should include a mix of real world or simulated real world practical applications with effective use of scholarly research in which to develop the practical demonstrations of CLOs and PLOs.

4 ContinuingFurther Research
The emerging online education system has opened up, and is continuing to open,new opportunities for possible improvementsin teaching and learning. But there is still much to understand about how learning happens and ways to enhance learning and make it more permanent.In addition to reflective and critical thinking skills, are there other skills that the learner can gain that will further

enhance student learning capabilities in an online environment in a permanent way? This area needs further research.

This research, in the area ofthe emerging instructor's role and how the instructor can promote and encourage reflective and critical thinking,needs to continue. Future research areas include evaluating available and emerging technologies for more efficient content creation and distribution that promotes reflection, and ways to further reduce the cost, thus making this learning experience available to more learners worldwide. Virtualization [33-34] and the use of Big Data [35-36] are some of the technologies that have enormous potential in this emerging education paradigm.

5 Summaryand Conclusions

The current education system has come a long way but there is still much to understand about teaching and learning, especially about teaching and learning online. This study discusses the new role of the instructor and introduces best practices in content design and deliveryby the instructor to promote and encourage reflective and critical thinking skills in learners.Although many obstacles and opportunities still exist for transforming online learning into its full potential,these best practices in the area of content design and delivery provide a foundation for encouraging the learner to become a self-guided student. This, in turn, increases student engagement and learning effectiveness. The ability for online learners to take responsibility of their own learning by improving their reflective and critical thinking skills will not only improve their learning of the content but will become a significant skill that will stay with them for life.Given the technologies available, and more becoming available, the critical emerging role of the instructor is to help create the learning environment that will 'let learning happen' [10-14]by encouraging and promoting reflective and critical thinking skills in self-learners.

References:
[1] Learning-Theories.com, *Knowledge Base and Webliography.* http://www.learning-theories.com/paradigms

[2] Watson, J.B.,*Psychology: From the Standpoint of a Behaviorist,* Publisher: J. B. Lippincott, Philadelphia, 1919

[3] Chomsky, N.*, Of Minds and Language: A Dialogue with Noam Chomsky in the Basque Country* (edited by Massimo Piattelli-Palmarini, Juan Uriagereka, and Pello Salaburu), Oxford: Oxford University Press, 2009

[4] Warde, W. F., *John Dewey's Theories of Education*, International Socialist Review, Vol. 21, No. 1, Winter 1960

[5] Maslow, A.H.: A Memorial Volume Monterey, CA: Brooks/Cole, 1972

[6] Maslow, A., *A Preface to Motivation Theory.*Psychosomatic Medicine #5(1943) p.85-92

[7] Amin, M., Dey, P., Badkoobehi, H., *A Proposal for a New Graduate Degree in Internet Engineering and Cyber Technology*, The Third NU Faculty Research and Scholarship Conference, San Diego, California, September 8, 2009

[8] Amin, M. Dey, P. and Kick, R.,*Internet and Web Engineering*, Proceedings of the 2002 Annual Conference of International Business Association, Vancouver, Canada, May 22-25 (2002).

[9] Robinson, K. 2010. *Bring on the Learning Revolution*. TED Talk, Long Beach, California. http://www.ted.com/talks/sir_ken_robinson_bring_on_the_revolution.html

[10] Mitra, S., *Minimally Invasive Education for mass computer literacy*, Presented at the CRIDALA 2000 conference, Hong Kong, 21-25 June, 2000

[11] Mitra, S., Rana, V., *Children and the Internet: Experiments with minimally invasiveeducation in India*, The British Journal of Educational Technology, volume 32, issue 2, pp 221-232. (2001)

[12] Mitra, S., *Self organising systems for mass computer literacy: Findings from the 'Hole in the Wall' experiments,*International Journal of Development Issues, Vol. 4, No. 1 (2005) 71-81

[13] Mitra, S., Dangwal, R., Chatterjee, S., Jha, S., Bisht, R.S. and Kapur, P., *Acquisition of computing literacy on shared public computers: Children and the "hole in the wall"*, Australasian Journal of Educational Technology 2005, 21(3), 407-426

[14] Mitra, S., 2013. *We Need Schools, Not Factories*. Winner of TED Prize 2013. https://www.huffingtonpost.com/sugata-Mitra/2013-ted-prize_b_2767598.html

[15] Wattenberg, T. "Beyond Legal Compliance: Communities of Advocacy that Support Accessible Online Learning," *Internet and*

Higher Education, Vol. 7, No. 2, 2004, pp. 123–139.

[16] U.S. Department of Labor, "Section 504, Rehabilitation Act of 1973," <http://www.dol.gov/oasam/regs/statutes/sec504.htm>

[17] U.S. Department of Education. (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-analysis and Review of Online Learning Studies.* www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf

[18] Yu, H., "Web Accessibility and the Law: Recommendations for Implementation," *Library Hi Tech*, Vol. 20, No. 4, 2002, pp. 406–419.

[19] Orso, D., Doolittle, J. Instructor characteristics That Affect Online Student Success. *Faculty Focus: Focusses on Today's Higher Education Professional.* Nov.2, 2012. http://www.facultyfocus.com/articles/online-education/instructor-characteristics-that-affect-online-student-success/

[20] Horton, W. (2006). E-learning by Design Retrieved from http://books.google.com/books?id=pn1r35moircC

[21] Koedel, C. (2011). Grading Standards in Education Departments at Universities. [Article]. *Padrões de Avaliação nos Departamentos de Educação nas Universidades., 19*(23), 1-20.

[22] Flores, R., Coward, F., & Crooks, S. M. (2010). Examining the Influence of Gender on the Modality Effect. [Article]. *Journal of Educational Technology Systems, 39*(1), 87-103. doi: 10.2190/ET.39.1.g

[23] Liqiu, W. (2011). Formative Assessment in Classrooms: Operational Procedures. [Article]. *Journal of Language Teaching & Research, 2*(1), 99-103. doi: 10.4304/jltr.2.1.99-103

[24] Patron, H., & Lopez, S. (2011). Student Effort, Consistency, and Online Performance. [Article]. *Journal of Educators Online, 8*(2), 1-11.

[25] Gregorius, R. (2011). Student Performances in Various Learning Protocols. [Article]. *Journal of College Science Teaching, 40*(5), 85-95.

[26] Shephard, K. (2009). e is for exploration: Assessing hard-to-measure learning outcomes. [Article]. *British Journal of EducationalTechnology, 40*(2), 386-398. doi: 10.1111/j.1467-8535.2008.00927.x.

[27] Howard, B., & Tomei, L. (2008). The Classroom of the Future and Emerging Educational Technologies: Introduction to the Special Issue. *International Journal of Information and Communication Technology Education, 4*(4).

[28] Lumsden, E., Mcbryde-Wilding, H., & Rose, H. (2010). Collaborative practice in practice in enhancing the first year experience in Higher Education. *Enhancing the Learner Experience in Higher Education, 2*(1), 12

[29] Condie, R., & Livingston, K. (2007). Blending online learning with traditional approaches: changing practices. [Feature Article]. *British Journal of Educational Technology, 38*(2), 337-348.

[30] *Building a Robust Education System*, at http://www.reach.gov.sg/Portals/0/Blog/Snapshot/Archive/Building%20a%20Robust%20Education%20System.pdf

[31] O'Hanlon, N., Diaz, K.R., *Techniques for Enhancing Reflection and Learning in an Online Course.* MERLOT Journal of Online Learning and Teaching, Vol. 6, No. 1, March 2010

[32] The Third Force: The Psychology of Abraham Maslow Frank Goble, Chapel Hill, NC: Maurice Bassett Publishing, 2004. Published as an electronic book and available from www.AbrahamMaslow.com.

[33] Romney, G.W. & Stevenson, B.R. (2004). An Isolated, Multi-platform Sandbox forTeaching IT Security Engineers, SIGITE 2004Conference Proceedings, ACM Press ISBN:1-58113-936-5.

[34] Romney, G.W., Higby, C., Stevenson, B.R., &Blackham N. (2004),A Teaching Prototype forEducating IT Security Engineers inEmerging Environments, IEEE ITHET 2004Conference, Istanbul, Turkey, IEEE Catalog Number: 04EX898C; ISBN 0-7803-8597-7.

[35] Big Data (n.d.). Retrieved from http://en.wikipedia.org/wiki/Big_data, Sep. 23, 2013. Cisco (2013). "Dawn of the ZettabyteEra,"Retrieved from http://blogs.cisco.com/news/the-dawn-of-the-zettabyte-era-infographic/ September 25, 2013.

[36] IBM (n.d.). "IBM What is big data? - Bringing big data to the enterprise," Retrievedfromwww.ibm.com. Retrieved August 26, 2013.