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MOOCs4D
POTENTIAL AT THE
BOTTOM OF THE
PYRAMID

April 10 - 11, 2014

Conference Report

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Introduction

The recent rise of Massive Open Online Courses (MOOCs) has generated significant media attention for their potential to disrupt the traditional modes of education through ease of access and free (or low-cost) content delivery. To date, nearly all of the attention has been on how major research universities can create their content for worldwide consumption. The vision of the MOOCs4D Conference was to focus the conversation specifically on the developing world by broadening the discussion to consider: new definitions of MOOCs, new frameworks for the utilizations of MOOCs, and new directions for MOOCs in the low income countries.

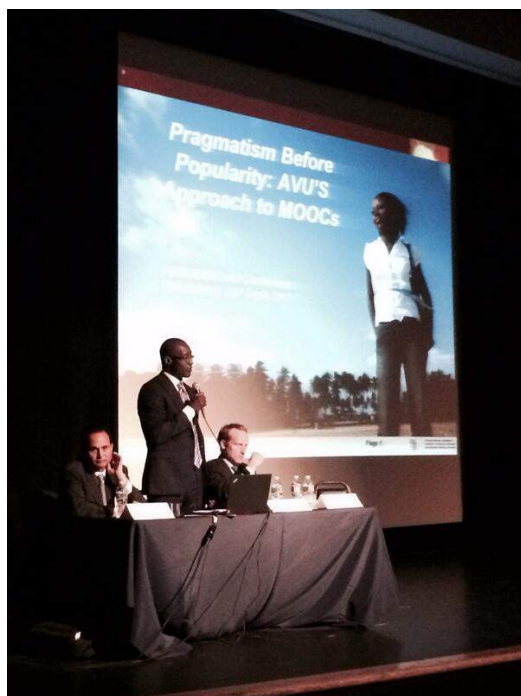
The popularity of MOOCs may be seen through an increasing demand for post-secondary enrollment that is predicted to increase from 150 million students in 2009 to 250 million students in 2025. MOOCs have a distinct advantage in that they use technology to scale, and are able to provide learning opportunities to many more individuals than traditional brick-and-mortar institutions. Not only do MOOCs hold out the prospect of greatly expanding capacity to meet growing demand worldwide, but they also offer the potential of enabling access to high quality education to all persons regardless of socioeconomic status, even in the most impoverished and under-served regions of the world.

These developments have generated considerable excitement in higher education worldwide. Current MOOC platforms have students registered in nearly 200 countries, with about two-thirds from US and Western Europe regions, about 6% from Brazil, 5% from India, 4% from China, and the remainder from everywhere else. And these numbers may be changing rapidly. With such a rapid worldwide expansion, there are concerns about the relevance of content offered, languages of instruction, how to meet diverse learning needs, cultural differences in teaching, and accessibility in various regions with poor telecommunications infrastructure.

Consequently, the MOOCs4D International Invitational Conference brought together scholars, policy makers, program officers, administrators, and technologists from the education and international development sectors. Through discussions from a wide array of perspectives, the conference aimed to better understand the dynamics surrounding this situation, and deliberate on solutions and action plans that will enable MOOCs to serve the development needs of resource-poor communities of learners – those at the "bottom of the pyramid."

This Report, therefore, is designed to be the *beginning* of a conversation (and debate) on the future of MOOCs from a global perspective. The research to date—as summarized in the panels that follow—is thin. Many claims about MOOCs abound, but the field is so new that much is conjecture. There can be little doubt, however, that we will know a great deal more in the coming years, and that the field of global education will be impacted in very important ways.

Plenary Session 1: The Advent of MOOCs



“How do we serve people in resource-poor environments?”
-Michele Petochi

Moderated by Joseph Sun, Vice Dean for Academic Affairs at the School of Engineering and Applied Science (SEAS), Plenary 1 *The Advent of MOOCs* included presenters: Abdul Waheed Khan, former Assistant Director General for Information and Communication at UNESCO, Paris and past Vice Chancellor (President and CEO) of the Indira Gandhi National Open University, Bakary Diallo, Rector of the African Virtual University (AVU) and Michele Petochi, Managing Director at the École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland.

Abdul Waheed Khan began the plenary by referencing what he termed the earliest forms of MOOCs nearly thirty-five years ago in the rural areas of India where a food shortage was crippling the population. Through a public-private partnership with the public service radio and a combination print, and in-person support, Khan explained that the intervention was effective because it: 1) tackled a local problem, 2) employed the local language, 3) included a range of stakeholders, 4) included incentives for participants and 5) had hands on support. He added that the single greatest catalyst for the proliferation of MOOCs is the massive unmet need of educational opportunities for learners in emerging contexts.

Additionally, Khan reflected on his time at the Open University where he cited the cornerstone of their success as their ability to design courses that matched the skillsets of the market place. The 3,500 learning centers erected by Open University were a result of strategic partnerships with public and private institutions that sought out the skills of learners and were equally invested in pupils' success. Tailor-made programs for the engaged industries resulted in curriculum that specifically equipped learners with requisite skills to deliver in the workplace. In closing, Khan suggested that the MOOCs of today are similar to the ones he first encountered thirty-five years ago, and can be successful following the same formula of relevant and relatable content that address local issues, utilize local languages, and are responsive to the dynamics of emerging learners.

Bakary Diallo's presentation, entitled “Pragmatism before Popularity,” shared both the challenges faced by the 19 partner universities of the African Virtual University (AVU) and a roadmap for future initiatives capitalizing on the growing capacity of MOOCs to meet the needs of learners on the continent. Of the numerous challenges he shared, those specific to Sub-Saharan Africa included the gap in national and institutional policies to accredit learners, resistance to a change from the standard “brick and mortar” institutions, and the scarcity of human resources to support new initiatives. Despite the challenges, Diallo purported AVU is positioning itself to take full advantage of recent developments. Fiber optics penetration, alternative power sources, cheaper and more varied mobile technologies, and a projected \$513 million in revenues from eLearning suggest that MOOCs and other open online learning platforms are a viable avenue for emerging learners. Diallo particularly highlighted Massive Open Online Programs (or MOOPs) which he defined as low bandwidth platforms, with accreditation in all AVU countries in order to increase both access and completion rates.

Michele Petochi of the EPFL placed MOOCs in the general context of emerging technologies and suggested that MOOCs are experiencing a normal hype cycle, but nonetheless concluded that they are certainly here to stay. A central theme of his presentation was case made for learner-centered trajectory for future MOOCs while raising the question; “How do we serve people in resource-poor environments?” Petochi suggested that despite design for massive numbers, programs for the needs of specific groups should certainly be the aim. Moreover, he suggested that pedagogy to be dictated not by tradition but by the individualized needs of learners.

Why MOOCs for the Bottom of the Pyramid?

One of the main critiques of MOOCs is their lack of contextualization in terms of technology access, language, and content, at the bottom of the pyramid (BOP). MOOCs4D bring a new approach by investing in the creation of MOOCs that can be linguistically diverse, technologically accessible, and use content that is simple and reachable to audiences with basic levels of education. To reach the BOP is a major challenge.



Panel A: Economics of MOOCs

When looking at the prospect of MOOCs reaching the bottom of the pyramid, it is necessary to discuss the economics of such a possibility. The presenters in the panel, *Economics of MOOCs*, explored various business models and questioned the potential of MOOCs working in developing countries based on these models.

Clara Ng from Coursera discussed the idea of value creation as a necessary component for MOOCs to succeed in developing contexts. Considering resource-constrained environments, it is key to be aware of the costs to both the learners and universities. Ng determined that the costs included both time and money. Specifically, learners face opportunity costs, which may prevent them from seeing the value in taking a MOOC. The necessary value creation would need to overcome the opportunity costs to learners and the production costs to universities. Ng insisted, “When these costs become prohibitive, that’s when the entire market breaks down.” Attempts at off-setting costs have included compensation for faculty and “freemium” models for students. The “freemium” model is such that the class itself is free but premium services such as proof of completion are an additional fee. Ng concluded with the statement: “By understanding the costs and the value that is generated for both universities and learners, we can create an ecosystem that is sustainable.”

From the OECD Directorate of Education and Skills,

Michele Rimini built off of Clara Ng’s presentation by questioning the true definition of a MOOC. In his comparison between Open Educational Resources (OER) and MOOCs, he asked: “Are MOOCs an inclusive innovation in education?” In looking to answer this question and improve accessibility, he presented five business models: 1) public-private entities used for funding; 2) institutional enlargement; 3) freemium model, as mentioned earlier; 4) advertising by collecting personal data and targeting ads to users; and finally 5) professional training used by organizations. Yet, the main question posed with every model was: can it work in developing countries?

Finally, representing the International Finance Corporation (IFC), Juliana Guaqueta discussed her organization’s recent focus on how MOOCs can be a new way to address both gaps in access and quality. Agreeing with the aforementioned business models and cost-benefit discussion, Guaqueta maintained that any model must be able to be scaled up at affordable prices and that there must be a balance in supply and demand for it to be successful.

In summary, the three speakers asserted that when looking at the economics of MOOCs, the business model must be sustainable. While they did not conclude that any one model was the best, they agreed that whichever model used must also be linked to what both the learners and producers need in order to move forward. The best model will match with the education needed to produce learners with valuable skills for the workplace as well as provide incentives for the creator or sponsor.

Panel B: National and Global Perspectives

With the expansion of technologies across the world, the opportunities and challenges of MOOCs are important to consider from both national and global perspectives. Concerns regarding MOOCs vary widely across countries, ranging from accessibility of infrastructure, resource capacity, language of instruction, relevance of content, and cultural perceptions of online learning. By examining the needs in different settings, a deeper and broader understanding of the future impact of open online courses can be gained for the developing world. As a result, representatives from universities across multiple continents shared their perspectives on MOOCs and its potential in their specific contexts.

At the Mongolian University of Science and Technology (MUST), Turbat Renchin described the initiatives of developing an open educational platform. The main objectives of the program involved: 1) setting up a framework for e-learning policy coordination; 2) developing an open e-content and methodology; 3) forming mechanisms of open and e-learning services and activities; 4) developing human resource capabilities; and 5) setting up enabling environment for carrying out e-learning programs. Through the implementation of the program in a Learning Management System, the university sought to “provide education beyond dependence of location and time frame by introducing flexible, open, accessible, variable, quality, and effective framework of learning approach.”

Additionally, as the vice president of the Vietnam National University of Ho Chi Minh City, Nguyen Hoi Nghia discussed ways that MOOCs can benefit students in Vietnam, particularly by addressing the growing demand for higher education that currently remains unmet by the formal education system. Some of the potential advantages of MOOCs in Vietnam include reduced costs, productivity and efficiency, standardization, and increased accessibility. The current opportunities for MOOCs development identified in Vietnam are seen as a supplement for traditional classes and for practical skills instruction, with a long-term plan for possibly initiating online course programs that lead to certification. However, some of the obstacles for development include cultural perceptions that distance education produces low quality education in society, limited Internet

infrastructure in remote areas, low independent learning skills of Vietnamese students, and insufficient numbers of teaching staff. With these concerns in mind, the university intends to establish a center for MOOCs development that collaborates with partners worldwide to deploy courses online, particularly focusing on practical skills instruction for students.

Meanwhile, Nodumo Dhlamini emphasized the information, communication, and knowledge management components of MOOCs, as a representative from the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). The Forum, which addresses higher agricultural education issues in various parts of Africa, implemented an ICT program in order to tap global innovations in university education and to improve access to RUFORUM’s core programs through eLearning. The program achieved a number of milestones including groundwork for effective ICT implementation at universities, development of e-learning policies and strategies for technology-mediated learning, and better dissemination of agricultural research. Even though challenges regarding sustainability and demand for ICT support posed potential barriers, Dhlamini proposed an ICT community of practice to address these issues and promote successful development of MOOCs.

As demonstrated in these examples, countries around the world are making significant strides in understanding and utilizing online learning in developing contexts. Through the expansion of MOOCs, national and global perspectives remain critical in improving the future of educational development.



Panel C: MOOCs, ODL and OER

The *MOOCs, ODL and OER* panel focused on how MOOCs and Online Distance Learning (ODL) require Open Education Resource (OER) for success. Issues included ownership and intellectual property, fair use, English-language dominance, and creation of locally appropriate MOOCs. The need for awareness of OER for the success of MOOCs was also addressed.

Rory McGreal, UNESCO/Commonwealth of Learning Chairholder in Open Educational Resources at Athabasca University and Canada's Open University, argued that copyright and intellectual property are privileged monopolies allowing publishers to control content. Extending this idea to MOOCs, McGreal said, "You learn, but you don't own what you learn, Coursera owns it." OER is essential and unless we create clarity for fair use, localization of and access to MOOCs is impossible.

Dendev Badarch, UNESCO Representative to the Russian Federation and Acting Director of the UNESCO Institute for Information Technologies in Education (IITE), focused on ICT use for primary education teacher training through MOOCs and ODL. Badarch said, "ICT used well by good teachers can enable every child to achieve their learning potential." IITE is also gathering non-English OER case studies to address language barriers, OER awareness, and OER and teaching integration.

"ICT used well by good teachers can enable every child to achieve their learning potential."

-Dendev Badarch

Finally, Ticora Jones, Senior Advisor and Program Director in the USAID Office of Science and Technology managing the Higher Education Solutions Network, spoke about the need to rate and aggregate OER. She argued for the need to ensure quality resources that are locally appropriate. Calling for OER to focus on big ideas, Jones stated, "We should challenge ourselves to think of how we create lifelong designers and builders and problem solvers."

The panelists agreed that access and language issues must be overcome for MOOCs and OERs to succeed. However, the concern that OER will battle with publishers for acceptance still remained unresolved at the end of the panel. The panel also raised issues regarding whether English really should be the international language of MOOCs and OER.



Can MOOCs provide contextualized content?

Early attempts at merely translating existing content or having local professors give lessons on foreign concepts is insufficient. In MOOCs4D, more emphasis needs to be placed on providing a truly culturally appropriate environment, developed in collaboration with local experts, so learners can better engage with the content.

MOOCs and International Development



Moderated by Mohamed Maamouri, Senior Researcher and Research Administrator at Penn's Linguistic Data Center, the second plenary, *MOOCs and International Development*, featured Papa Youga Dieng, Coordinator of the Initiative francophone pour la Formation à Distance des maîtres at the Organisation Internationale de la Francophonie (OIF), Sandra Klopper, Deputy Vice-Chancellor at the University of Cape Town, South Africa, and Steven Duggan, Director of Worldwide Education Strategy at the Microsoft Corporation.

Papa Youga Dieng presented an institutional perspective from the OIF. As the institution's strategic plan 2002-2015 calls for direct support of the education sector, the OIF is presently invested in three flagship initiatives; in-service training programs for teachers in primary schools and head of primary schools throughout Francophone Africa known as *ifadem* (ifadem.org); *Examen.sn*, a Senegalese-based intervention which targets pupils in primary and secondary schools as well as their teachers and parents; and *REL 2014* a MOOC on open educational resources (OERs). Dieng described a number of barriers to success of MOOCs and OERs, including the a shortage of qualified teachers (between 40-60%), and limited infrastructure to support access to poor communities. The opportunities that the OIF recognizes as areas for growth for OERs address the outlined challenges in areas such as teacher professional development, multiple modal delivery of educational resources, and the use of mobile technology and alternative energy sources.

Sandra Klopper of the University of Cape Town referenced her experience throughout Africa in higher education but was careful to qualify her perspective as strictly in reference to Anglophone Africa. Klopper described the MOOCs phenomena, from the African perspective, as being nearly exclusively consumers of MOOCs. Klopper made a case for MOOCs to showcase African knowledge and expertise, and as an opportunity to use the platform in order to provide interventions for bridging the gap of skills between secondary and tertiary education. In her overview of the challenges of MOOCs, she referenced the major costs associated with expertise required to produce content. Klopper highlighted two models of success using wrapped/blended education initiatives in Africa: Makerere University's program to improve the productions and economic performance of dairy farms using OER and a World Bank and Tanzanian Commission for Science and Technology partnership that recently launched a pilot to meet the needs of students who need market-relevant IT skills.

In his presentation entitled, "Anytime, Anywhere, Learning for All: Technology, education and equality of resources can be focused to deliver personalized learning experiences," Steven Duggan contended that the current modalities are "failing everyone" from the students, to parents, to employers. Furthermore, he referenced his own experience in his role at Microsoft extensively visiting classrooms around the globe and suggested most students, when asked, are commonly unengaged and uninterested. Duggan also introduced a recent development at Microsoft known as *lit4life.net*. In an effort to address the 1 in 4 people on the world who are illiterate, Microsoft has designed this portal, which allows anyone, anywhere, to create a book for free. It directly addresses the 31% percent of illiterate learners who also live in illiterate homes. The books include text and illustrations as well as audio. Additionally, over 7,000 languages can be represented (some of which are classified as dying languages). The platform also includes mechanisms to track new readers' growing skills and point them to additional resources. Duggan concluded by sharing his vision of the classroom of the future as a technology-enabled environment that allows personalized learning seen formally only in apprenticeship arrangements. That technology, he stated, must be available to both the developed and undeveloped world.

Plenary Session 3: The MOOCs Challenge

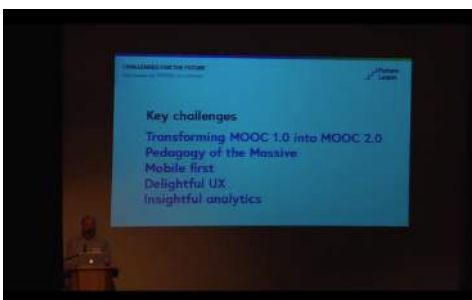
Moderated by Dan Wagner, Professor of Education at the University of Pennsylvania, Plenary 3, *The MOOCs Challenge*, included presenters: Stephen Downes of the National Research Council (NRC) of Canada based in Moncton, New Brunswick, N.V. Varghese, the current director of the Centre for Policy Research in Higher Education (CPRHE), New Delhi, and Russell Beale, Professor of Human-Computer Interaction at the University of Birmingham. Wagner framed the conversation by posing the following questions: Have we reached a consensus regarding *what* we are talking about when we reference MOOCs, and what are the challenges in and for MOOCs in developing countries?

Presenter Stephen Downes began by challenging the common rhetoric of the ability of MOOCs to democratize education by suggesting that the democracy we have created is characterized by wealth concentration at the top and inherent inequalities for those at the bottom. Downes argued that the pyramid structure is a myth that is based on a scarcity of knowledge and resources. He contended, “There is enough knowledge for everyone and there is enough access for everyone, but we have not taken it to heart to make that access and distribute that content to those who need it.” Referencing the first MOOCs launched in Canada in 2008, he stated that their success was due to the focus on a network of learning rather than the “super-professor model” he said we witness today. A theme throughout Downes’ presentation was that basic design principles that should characterize MOOCs include: the autonomy of the learners to pick their path, and the recognition of the diversity of learners (language, culture, and motives).

N. V. Varghese began his presentation by giving a general overview of the rapidly expanding higher education needs of those in the developing world. Although he acknowledged the potential of MOOCs, he was quick to note that the MOOCs as we know them are commonly “romanticized” and are not the “blatant mechanism to expand higher education.” Varghese defined the current global learning crisis stating that “the disparity in access is getting narrowed down but the disparity between achievement is widening.” He concluded by making the recommendation that rather than viewing MOOCs as a standalone, independent, parallel activity, rather a partnership with existing institutions of higher education could lead to expansion in enrollments and local access to education in developing countries.

Russell Beale shared perspectives from Future Learn, the UK MOOC offering which was founded by the Open University and consists of over 30 partners. Much as with the internet, Beale contended that MOOCs must migrate from a model of content being put up for learners to a space where learners can gain a socially interactive experience that is centered around the way the learner chooses to engage and takes into account the platform that pupils use for content delivery. To that effect, Future Learn is shaping their MOOCs to promote small group conversations and peer learning/evaluations, apps and content that provide what he termed a “delightful user experience” on mobile platforms, and with built in analytics that measure how learners use the software.

The presenters concluded the plenary by briefly sharing their thoughts on the up and downsides of MOOCs. The pro points included the infrastructure for people to create and engage in their own learning environments through enabling technology, while the downsides focused on the capacity of MOOCs to eliminate the diversity of education by focusing on elite institutions which may further reinforce the pyramid frame of educational access.



“There is enough knowledge for everyone and there is enough access for everyone, but we have not taken it to heart to make that access and distribute that content to those who need it.”

–Stephen Downes

Panel E: Building Global Capacity in Digital Information Resources: Creation, Sharing and Use

“Quality teaching, learning and research all depend on access to scholarly communication. Information resources and the production of knowledge are key ingredients for social and economic development in contemporary societies.” – Martha Brogan

As the global community seeks to improve educational outcomes, technology and libraries can play a role in increasing access to information, specifically in developing countries. Martha Brogan of the Penn Libraries at the University of Pennsylvania noted that, “quality teaching, learning and research all depend on access to scholarly communication” in order for individuals to have access to new ideas and information. “Information resources and the production of knowledge are key ingredients for social and economic development in contemporary societies,” Brogan added.

Research4Life, a collective working to increase access to information resources, seeks to reduce the knowledge gaps between the Global North and South. Kimberley Parker of Research4Life explained that the organization increases access to academic journals and books through technology. By working with research universities and institutions worldwide, Research4Life provides free access to academic journals to institutions in 71 low-income countries that provides a reduced subscription price to research institutions in an additional 45 countries. This program utilizes technology to expand the research capacity by providing access to up to date research and literature.

Mary Ochs of Cornell University, highlighted the specific benefits to agriculture learning and research with The Essential Electronic Agricultural Library (TEEAL) and Agora programs. TEEAL supports agricultural education by providing institutions with a “library in a box.” Cornell University creates software and TEEAL distributes the resources to 375 institutions globally. By providing with access to agricultural journals, TEEAL, seeks to disseminate new information. Similarly, Agora works with the Food and Agricultural

Organization of the UN to disseminate approximately 5,000 academic journals and e-books to support learning and research in agriculture. Ochs argued that for researchers to conduct new and authentic research, it is essential to complete a literature review. TEEAL and Agora provide the necessary resources for researchers to identify research gaps and create studies to fill these voids.

Rob Cronin of the International Research and Exchanges Board (IREX), stated that “access to the internet can both increase global disparities and equity” and as technology expands, researchers and policymakers must consider methods for promoting best practices in technology for development. As the Director of the Center for Collaborative Technologies, Cronin works closely with the Gates Foundation on a project specifically targeting libraries. IREX aims to utilize MOOCs to “redistribute resources” and increase local institution’s access to information by using existing libraries. IREX’s model seeks to broaden public access to information, as libraries can provide a safe space for learning and are sustainable due to government funding and budgets.

Research4Life, TEEAL, Agora and IREX all seek to strengthen local capacities through the dissemination of information and academic resources. By providing local universities, research institutions and non-profits with access to information, these organizations are working to increase the access to information and research in developing countries.



Do MOOCs promote equity in developing contexts?

One misconception about MOOCs is the oft-claimed belief that because MOOCs are free, they have the potential to democratize education across borders, and differences by gender, ethnicity, and economic class. Data from both developed and developing countries have found, by contrast, that the users of MOOCs are disproportionately elite, young, and male. Practical limits to MOOCs access in developing contexts include a lack of resources and infrastructure. Additionally, successful engagement with MOOCs requires specific learning skills and foundational knowledge on part of the learners. If such limits are not seriously addressed, MOOCs have the potential to widen inequality in developing countries, providing more for already advantaged, and little for the rest.

Panel F: Overcoming Digital Infrastructural Constraints

Moderated by Michael L. Best, associate professor at the Sam Nunn School of International Affairs and the School of Interactive Computing at the Georgia Institute of Technology, the panel on *Overcoming Digital Infrastructural Constraints* included presenters: Mamadou Adj, director of Ecole Supérieure Polytechnique (ESP) in Dakar, Senegal, Jamie Alexandre, Software Architecture Lead at the Foundation for Learning Equality, and Mpine Makoe, Head of the Institute for Open Distance Learning at the University of South Africa (UNISA) in Pretoria.

Mamadou Adj highlighted the Réseau d'excellence des sciences de l'ingénieur de la Francophonie (RESCIF) partnership, which was put in place during the 13th summit of the Heads of States and Governments of the Francophonie, held in Switzerland in early 2014. The partnership consists of 14 universities from Africa, North America, Asia, Europe, and the Middle East, and aims to promote technological innovation across the network. At the nexus of this initiative is the aim of implementing a large-scale partnership in Africa and future emerging countries through public private partnerships that will make optimal use of the MOOCs platform. Initial course offerings range from urban planning in African cities to introductory courses in computer programming.

Mpine Makoe shared a newly introduced pilot course in English writing at the University of South Africa (UNISA). UNISA presently has 15 campuses, five thousand faculty members, and serves over 400,000 students in 193 countries. Many students are remote learners. The pilot course seeks to support interaction between lecturers and students who are off-site. All interactions are mobile phone based and is limited to

users who have Internet access. It is the aim of UNISA to leverage lessons learned from the pilot regarding learner practices to inform further MOOCs development.

Jamie Alexandre introduced the Khan Academy *lite* platform, a lightweight web app for serving core Khan Academy content (videos and exercises) without needing Internet connectivity from a local server. In his words, the platform has the potential to take the “online revolution, offline” providing accessibility to 65% of the world that lives without regular access to the Internet. Alexandre concluded by advocating an increased push for open access to content through *Creative Commons* and related organizations, as well as a support for MOOCs to move towards the cultivation of locally based content.

Overall, the panel contributed ideas toward emerging and successful initiatives for overcoming infrastructural limitations in the global South.



Panel G: MOOCs and Higher Education Institutions



Considering the extent to which MOOCs improve higher education access and quality or rather contribute to increased stratification in higher education, the panelists of *MOOCs and Higher Education Institutions* suggested that MOOCs have shown to be cost-effective solutions for a variety of purposes, including expanding access to higher education, globalizing higher education, and providing learning support to students. However, limited empirical studies have shown MOOCs' actual impact for those at the bottom of the pyramid.

Although MOOCs are seen as promising from a policy perspective, Libing Wang of UNESCO-Bangkok recognized that effectiveness will require the enthusiasm of users and institutions. One of UNESCO's priorities is thus to upgrade open and distance learning programs, promote blended learning, and bring technology, pedagogy, and content experts together, in order to convince skeptics that MOOCs can provide quality education. Addressing the issue of cross-border supply and accreditation, Wang supported the use of foreign MOOCs for joint study programs that can lead to domestic certification. Such a model benefits the developing countries on both the institutional and individual levels, as qualified candidates are retained at domestic institutions and access to quality education is additionally expanded to non-elites. In the development of these cross-border MOOCs, Wang stressed the importance of focusing on the localization and customization of knowledge to the needs of the developing countries, the protection of indigenous knowledge, and the contribution to capacity building of

higher education institutions in developing countries.

Shifting from a policy standpoint to an institutional standpoint, Gayle Christensen of the University of Pennsylvania discussed the university's experience with offering MOOCs, as well as some early empirical data on MOOC users. As one of the first partners of Coursera, Penn currently offers 40 MOOCs to nearly two million students. Through a survey study, it was found that the population engaged with Coursera MOOCs is predominantly educated, employed, and males. Penn's new business MOOCs offered through the Wharton School of Business, however, are attracting an even more diverse student-body. Overall, these business MOOCs have reached nearly double the number of underrepresented U.S. minorities than traditional business schools. Given such promising results at Penn, Christensen suggested that the future of MOOCs4D must consider the prospect of delivering courses through mobile devices and expand to reach basic and secondary education so that courses are accessible to non-college educated students.

Finally, Abdellatif Miraoui, the president of Cadi Ayyad University in Morocco, discussed some of the ways in which MOOCs are helping to solve key challenges at his university. In order to address the issue of high dropout rates due to resource constraints for academic support, UC@MOOC (mooc.uca.ma) has given students open access to audio-video courses as well as to lab activities, seminars, and conferences presented by their professors. With students having done preparatory work on their own, classrooms have become more interactive and flexible. Moving forward, Cadi Ayyad University is interested in expanding UC@MOOC to an EdX platform, and plans to include evaluation for studies, scale-up their projects to include master courses, and increase research on the project's success.

Underlying each presentation was the acknowledgement that MOOCs in higher education are here to stay. However, although MOOCs serve as creative solutions for some higher education challenges, they must continue to address the fundamental issues of access, equity, and quality that have always been central concerns to colleges and universities.

Panel H: Global Health

Tapping into the potential of massive, open education could have powerful implications for the field of Global Health. An unmet demand for practical and professional training opportunities to improve health and livelihoods exists in developing countries. Severe health worker shortages, poorly resourced clinics and laboratories, and limited access to health information represent persistent challenges for the majority of the world's health systems. Such challenges are compounded by conditions of poverty, where those striving to increase their household income encounter few opportunities to further their education and pursue new opportunities. Yet innovations in technology-enabled post-secondary training programs are beginning to address these challenges, as highlighted by Rebecca Stoeckle, Ryan Littman-Quinn and Karen Charron during the MOOCs4D Global Health Panel.

Poverty and lack of economic opportunities are often deeply intertwined with poor physical and emotional health. Through the HP Life initiative, Rebecca Stoeckle and her colleagues at the Education Development Center have been working to create a practical training and mentoring program for budding entrepreneurs in developing countries. Understanding the specialized needs of adult learners in low-income, low-literacy and low-techno-literacy contexts, Stoeckle posed the question: “You have to wonder why we would apply the linear framework of a typical classroom environment to the work we are doing online.” New approaches are required, and in response to this, HP Life provides multi-lingual, collaborative and interactive modules in finance, marketing, operations and communication available through a cloud-based platform. After about a year of work, HP Life includes a user population of over 160,000 representing more than 185 countries, and many of the users have gone on to create their own businesses.

As a country that globally ranks second in HIV and fourth in TB prevalence, and with only 1 doctor for every 2,500 people—compared to 1 doctor for every 400 people in the United States—Botswana is home to a population in great need of improved health care services. Through the Health Informatics Capacity Building Program of the Botswana-UPenn Partnership, Ryan Littman-Quinn has been working for the past five years to address some of these needs through the introduction and scaling of technology-enhanced medical education projects. By providing physicians with 7-inch Android tablets pre-loaded library resources,



medical research, local treatment guidelines, drug and dosage guidelines, and the ability to communicate with peers and mentors, Littman-Quinn and his colleagues have adapted and applied what he refers to as a “fundamental informatics theorem”: that a multi-functional device operated by a human being is better than a human being (or a human brain) alone, and that this effect increases as the network of users increases.

While prestigious universities have historically served as the gatekeepers for medical research and clinical training, Karen Charron has applied her knowledge and passion for disseminating medical information from the “campus to the village” through the use of MOOCs to increase scientific literacy and build public health awareness. Drawing from her experience designing and teaching the MOOC “Vaccine Trials: Methods and Best Practices” at Johns Hopkins University, Charron underscored the need for improved immunization as a global health priority, particularly in light of the extensive misinformation regarding vaccine safety. Over 11,500 individuals—41% with no prior background in health or vaccines—enrolled in the course, indicating a strong interest and demand in the topic.

Each of the presenters acknowledged persisting challenges, including reaching the most marginalized communities, and responding to the diverse educational needs of adult learners. Yet flexible designs that encourage active engagement and social interaction coupled with strategies that build upon public-private partnerships were heightened as key components required for sustainable scaling of health-related MOOCs. Future initiatives that are able to build upon these early experiences may have great potential to have a significant impact on global health.

Panel I: Authorship and Ownership

MOOCs are becoming a predominant form of knowledge production in the cyberspace. While the MOOCs economy is getting larger and diverse, questions with regard to authorship and ownership became acute. For an in-depth discussion of this issue, the MOOCs4D conference hosted a panel on the *Authorship and Ownership of MOOCs*.

Edward Rock, Professor of Law and Director of Open Learning at the University of Pennsylvania explained that there are two elements to consider when questioning the issue of MOOCs' authorship and ownership. Rock distinguished the differences between course expression and course content. Course expression includes all the processes and logistics needed to create the course including the videotapes, cameras, and studios. On the other hand, course content refers all the content needed to run the course. According to Rock, content should belong to the faculty whereas the expression belongs to the university. For instance, if a faculty member changes institutions, they can record new videos with the same content but they cannot use the same exact content. At Penn, the university provides licenses to videotapes for the faculty member for use in the university only.

Candice Reimers, Senior Manager in Learning and Development at Google, explored the questions of ownership in the context of cloud-based open source platforms. Reimers explained that cloud-based organizations approached the question of ownership differently. Ownership in the case of cloud-based open source forms is less complex because everyone can be an author and also because authors own their work. Therefore, Reimers explained that there are different layers of ownership in the case of open source platforms.

Ownership in this case is not exclusive to content but transcends it by owning the student's relationships, data and the brand itself. Reimers highlighted the fact that open source platforms can create new territories for the exploration of questions of authorship and ownership. Communities own the relationships and the interactions, and the platform owns the data.

As a Professor at the School of Education in the University of Pittsburgh, Maureen McClure explored the positioning of the different stakeholders involved in MOOCs with regard to the issue of authorship and ownership. She situated MOOCs4D at the intersection of the knowledge of elite education and cooperative extension. McClure explored issues regarding the rights of authorship and ownership. She also provided various perspectives of ownership of MOOCs from the perspective of the producers and the end users.

Overall, this panel showcased various perspectives concerning the ownership and authorship of MOOCs. The multiplicity of the stakeholders in the production of MOOCs and the massiveness of the audience makes the issue of ownership quite complex. Nonetheless, the panelists explained ways in which the complexity of the issue can be addressed, thereby ensuring that MOOCs4D generalize access to knowledge while giving credit to the owners and authors.

How do we measure the success of MOOCs4D?

In low-resource settings, MOOCs will require robust assessments and evaluation systems to measure the effectiveness of any MOOCs4D program. MOOCs4D initiatives around the world require established benchmarks for assessment and accreditation processes, essential for sustaining current and future programs. The quality of access and teaching-learning experiences in MOOCs4D initiatives need to be monitored following still-to-be-established benchmarks.



How can MOOCs be used for different educational levels?

Some claim that technological innovations can improve K-12 teaching process, but they cannot replace it. MOOCs can and should address teacher shortages and more localized content. Part of these challenges can be addressed by assuring that the MOOCs learning experience is individualized, interactive and capable of providing accreditation for learners (including teachers).



Panel J: K-12 Teacher Professional Development

There is increasing evidence that it is the quality of teachers that plays a defining role in determining student achievement. The 2013 UNESCO Global Monitoring Report presents the grim truth of how teachers from developing countries are struggling with crowded classrooms, lack quality training, and have only surface-level subject matter knowledge. If the use of technology is intended to more efficiently reach larger masses at lower price, it becomes inevitable to explore the question how MOOCs can address the issue of Teacher Professional Development.

Starting off the presentations of the K-12 Teacher Professional Development panel, John MacBeath, Professor Emeritus at the University of Cambridge, deconstructed the nature of improved teaching that MOOCs should aspire to bring about. He suggested that teachers are expected to disturb beliefs and provoke students to question. Clarification of this notion of teaching-learning process, along with knowledge of a region's contextual challenges helped MacBeath develop as many as 8 courses for countries including Maldives, Ghana, South Africa, Canada, and more. He critiqued the non-interactive practice of one-way information dissemination, and stressed the importance of building a classroom learning process that inculcates the culture of knowledge creation with others.

Gard Titlestad (Secretary General, ICDE) expanded on the role of MOOCs in facilitating the sharing of existing knowledge. Open and online distance education helps in connecting information to teachers to improve their quality of teaching. If a model is successful, then that

model should be further discussed and distributed. Titlestad particularly emphasized the need to strategize well. According to Titlestad, a well-planned strategy must be built on the strengths of that region, including a clear objective that backs the roll out of MOOCs, supporting them with follow-up projects.

Finally, Freda Wolfenden, Senior Lecturer in Education and Development at the Open University, perceived the latest trend towards “learner-centered pedagogy” as contestable. Building on her description of a major initiative in India, Wolfenden laid out the importance of theories of learning, teachers' views of learners, as well as the pedagogy that the teachers think they should be using. This understanding helps to strengthen the contextual knowledge needed for developing a MOOC or some other form of engagement. The content of the material must be localized. NGOs, government ministries, and universities spread across different countries are all required in the success of its implementation, invariably making collaboration a key component. To maximize the utility of MOOCs, it is important to steer the focus on teacher educators and their needs, so that they are able to effectively scaffold their learning process of teachers on an ongoing basis.

Finally, the audience raised important questions about the unique shortcomings of regions in need, including the inaccessibility of the Internet and high cost of broadband. The three presenters fine-tuned the potential of MOOCs as a medium that must be rooted in the discourse of teacher education—in its varying contextual assets and challenges.

Panel K: Blended Learning and Innovative Instruction

A relatively novel approach for enhancing education quality is a concept referred to as ‘blended learning’, whereby classroom instruction is complemented by online or technology-based reinforcement. One of the attractive benefits of this methodology is the ability of the learner to understand and progress through learning objectives at their own pace while reinforcing classroom-based instruction. Developing countries are just beginning to experiment with this innovation.

In Costa Rica, the Omar Dengo Foundation is applying a technology-based approach for Teacher Professional Development (TPD) to effectively orient an ever-expanding teacher base on the appropriate use of information and communication technologies (ICTs) in their classrooms. Leda Muñoz (Executive Director) explained that the centerpiece of their TPD program is a user-friendly virtual campus that emphasizes collaborative practice among teachers through peer-to-peer learning and assessment.

The Teaching and Learning Lab at the Massachusetts Institute of Technology (MIT) has been pushing the traditional MOOC research on learner behaviors and activities further to better understand students’ background, their previous experiences offline, and what that means for the virtual context. Jennifer DeBoer (Postdoctoral Associate) emphasized that “In order to understand what this virtual classroom space can do, we need to understand what it is in the real world context.” This approach is particularly important in low and middle-income countries where access to technology is scarce or absent. Data from MIT’s pioneering MOOC in circuits and electronics revealed illustrative findings that are helping the Lab better understand how learners from lesser-developed countries interact with complex technical material.

In Rwanda, Keplar University is applying a blended learning model that combines online academic content with in-person instruction. Keplar’s approach is to import initial content from the MOOCs and then have “learning experts” facilitate the process through techniques based on K-12 teaching strategies including project-based group work and case studies. Chrystina Russell, Chief Academic Officer at Keplar, indicated that their content tries to push critical thinking, professional and technical skills, and character, and emphasizes teaching students the “things that are going

to get them jobs.” This practical approach to learning incorporates internships and employer contributions to develop a tailored curriculum that responds to the needs of the labor market. Through a partnership with College for America, graduates earn a degree from the US that emphasizes learner competency over hours completed. Midline assessment results reveal that Keplar students are outperforming their Rwandan peers in terms of technical skills, critical thinking, and general SAT type skills. However, Russell mentions that broadband access and English proficiency are major challenges within this context, but their blended approach helps to reach some of the students that are not accessing the traditional MOOCs.

Finally, Dierdre Woods of Penn’s Open Learning Initiative (OLI) illustrated the University’s involvement within this domain that resonates the broader traditional MOOC experience. Penn’s OLI boasts an expanding learner base of 2 million students with over 100,000 course completions. Woods emphasized the importance of finding MOOC instructors that are passionate about education and who put in the time to develop the curriculum as a significant key for success. According to Woods, “you need to pair great teaching with great content, because learning is difficult at many levels.” However, Woods explained that from Penn’s experience, it has been difficult to integrate the narrow curriculum and material that is used in the traditional classroom setting and apply it to the virtual context with students coming from a diversity of backgrounds and learner characteristics.

Overall, the panelists saw blended learning as an important frontier in teaching and learning, and a critical part of the future of MOOCs.

