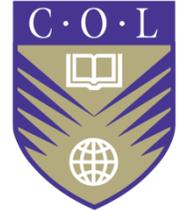


# *Changing the Tune: MOOCs for Human Development - A Case Study*

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The Massive Open Online Course (MOOC) is covered in critical analysis as well as in popular media as a development exclusively bearing on the Higher Education sector (The Economist, 2014). This term has also acquired an informal brand connotation – it refers to a package of course offerings, platforms, and processes identified with three pioneering organizations, namely edX, Coursera, and Udacity who tend to offer lecture and content-based MOOCs or “xMOOCs.” A thoroughly informed analysis of MOOCs has tended to focus on their role and impact in higher education in North America (Hollands & Tirthali, 2014). In contrast, proponents of connectivist MOOCs or “cMOOCs” have focused on pedagogy and style (for example, see Siemens, 2014).

Relatively less attention, however, has been devoted to the relevance of different types of MOOCs for those in developing countries. Data from MOOC providers show that the number of learners or “joiners” from developing countries is significant. For example, about 13% of joiners in edX are from India (Ho et al., 2014). In the available literature, there is no explicit statement of the usefulness of branded MOOCs in global development beyond the number of participants from developing countries. At best, there is an implicit assumption that the delivery process in branded MOOCs, if not the content, constitutes a Global Public Good (GPG) (World Bank, 2011). Institutions and individuals in developing countries, in their own interest, could make use of such a public good.

A branded MOOC does not provide course credit as a matter of standard practice. For learners from developing countries, course participation, in real-time or online, is expected to lead to credit. Given these expectations, is it sufficient to make a branded MOOC available without due credit and claim a contribution to global human development? MOOCs have the major

advantage of scale. How can institutions in developing countries utilize MOOCs to increase access to learning materials and courses for very large numbers of people?

These and related questions were considered from a perspective of re-engineering the technological and process components of the MOOC to enhance learner experience. COL built and offered a MOOC in partnership with a research university based in a developing country (i.e., Indian Institute of Technology- Kanpur, IITK) without involving the brand names usually associated with the MOOC. This online course on Mobiles for Development (M4D) (2013), offered in the last quarter of 2013, attracted 2,282 unique joiners from 116 countries. Of the more than 2,000 MOOC participants, 333 went on to receive certificates of competence or participation jointly issued by COL and IITK. Nearly 90% of the joiners were from developing countries. In addition, the proportion of developing country participants who received certificates was slightly higher than 90%, which is a sign of success in terms of original course goals and objectives. This MOOC was focused on the use of mobile devices in areas of development such as agriculture and food security. The content has been released as open education resources (OER) for anyone to use. What follows is a brief description of the course, and an analysis of the results that leads to an outline of a MOOC4D model.

### Unbundling and Re-engineering a Branded Practice: An example

As detailed in various chapters of this book, OER have been published globally for free and unrestricted re-use for about 15 years, especially since 2002 when an internationally accepted definition of OER was formulated (UNESCO, 2002). In the earlier phase, almost all OER were published by universities located primarily in the OECD countries. There was an assumption that this high quality content was a GPG produced in the developed world and that the developing world would re-use and create new local benefits.

A decade later, there are relatively fewer instances of such adaptation (Dhanarajan & Porter, 2012, McGreal, Kinuthia, Marshall, & McNamara, 2013). What has emerged is that developing countries are now significant publishers of OER. For example, in the Commonwealth, the total volume of OER published by the developing countries is larger than that from the developed countries (COL, 2014). Although the concept and practices of OER originated in the OECD countries, developing countries have been able to adapt and re-create them in their own contexts. The technology and processes in the OER paradigm have been de-linked from the content of developed countries; these were then re-combined with what was assessed to be good quality content from developing countries. The initial assumption was that OER was a package; however, OER is now a basket of processes, procedures, and content, some or all of which can be substituted or changed, as required.

In a similar vein, we believe this re-engineering and unbundling would be a more practical approach to assess the relevance of MOOCs in development. For example, unbundle the MOOC,

set aside the brand value, separate content from processes, procedures, and technology, and recombine these components to suit the context and purpose at hand. Doing so would enable institutions in developing countries to harness MOOCs in order to contribute to local and national development needs.

### COL-IITK MOOC on Mobiles for Development

During the year 2012, the COL commissioned a set of analyses on MOOCs with IITK (COL, 2013b). These analyses clearly showed that (1) the unbundling of content, processes, and procedures of a typical MOOC was feasible, and that (2) offering a MOOC is best viewed as managing an event (especially a media event) such as a virtual conference, rather than as a virtual classroom. Reliability of access even at lower bandwidths to the materials and interaction space of the MOOC was a critical factor. The opportunity for learners to interact with instructors and mentors was also critical to the success of a MOOC experience. Grading and assessment processes needed to be simple to implement in technological terms. These insights were derived from our experience and expertise in open and distance learning (ODL) and formed the basis for the design of the MOOC on M4D.

The topic of the course was identified from a number of consultations organised by the COL (2013a). We were keenly aware that the spread and pace of mobile phones in developing countries had been phenomenal. Moreover, we also realized that this growth had created new opportunities for addressing the digital divide and beginning to reach the unreached. COL's consultations with learning for development partners revealed that a neutral forum to discuss key concepts and developments in mobile technology would be highly welcome to stakeholders in developing countries. COL then decided to test the MOOC approach against this background. Given IITK's expertise in mobiles in agriculture (Balaji & Prabhakar, 2014) and experience with MOOCs, combined with the COL's strength in ODL and Lifelong Learning for Farmers, there were genuine synergies and a sense of complementarity in this partnership. Certification was an important consideration. It was agreed that the COL and the Center for Continuing Education at IITK would co-sign the certificates.

The course was managed by Professor T.V. Prabhakar of IIT Kanpur (i.e., IITK) in India with marketing advice and support provided by COL. IITK took responsibility for the core content on technology and involved a number of faculty members and associates from various departments. Using an online knowledge repository for information related to agriculture, the agropedia/vKVK team at IITK provided content for the topics related to agriculture. The goal of the vKVK or "Virtual Krishi Vigyan Kendra" is to connect KVK experts and local farmers using the Internet as well as mobile technology to help speed the transfer of technology to the farmer's fields (Bagga, 2010). Professor Mohamed Ally from Athabasca University in Canada led the m-learning portion of the MOOC, while faculty from the National Institute of Banking

Management (NIBM) in India, handled the section on financial inclusion. COL coordinated the participation of all non-IITK faculty.

COL, with the approval of IITK, invited an external expert to conduct an ex-post evaluation of the course, with a focus on its pedagogical aspects. A report of the course evaluation by David Porter, Executive Director of the BCcampus in British Columbia, was published as an open access document (Porter, 2014). In the following three sections, we quote extensively from the Porter Report.

### Course Platform and Delivery

COL initially considered using Canvas as a course delivery platform for the MOOC on M4D but the costs of hosting turned out to be high. IITK, with much experience in the use of various learning management systems (LMS), proposed using Sakai, an open source LMS, as the online class site. In addition, video content would be deployed on YouTube and the course homepage would be employed to host assorted other documents (e.g., PowerPoint files, video transcripts, announcements, etc.) and valuable course information. Online registration was also linked to this page.

The screen layout for the course was designed for straightforward navigation to all components of the course. The features of the M4D course environment included the following: 1. Course header and student workspace; 2. Navigation menu for the course; 3. Topic list; 4. Weekly module dividers; 5. Colour-coded topics; 6. Login and course role graphic; 7. Color-coded legend for topic; 8. Instructor for topic; 9. Video link for topic; 10. Slides and/or script link/s.

The primary instructional strategy for the M4D course was the use of instructional videos that varied in length from 2 to 25 minutes. In total, there were 92 videos produced by the development team for the course topics. The videos were organized over a six-week time period. Students were required to view 15 videos per week on average.

Most video lectures also included a supplementary PowerPoint slide deck. In some cases, a transcript was added to the video. In terms of resulting transcript benefits, student feedback indicated that scripts were helpful in dealing with unfamiliar accents or speech intonation.

There were two activity strategies employed during the course:

#### Chat room

1,641 messages were exchanged in the Chat Room during the course.

#### Discussion forums

General discussion forum with 398 messages across 76 topics.

Technical forum with 370 messages across 55 topics.

Technical support forum with 89 messages across 35 topics.

Online quizzes were employed as an evaluation strategy. There were three quizzes during the course:

Test Quiz      324 students submitted quizzes for evaluation.

Quiz 1          296 students submitted quizzes for evaluation.

Final Quiz     261 students submitted quizzes for evaluation.

The quiz format used multiple-choice questions.

### Course Results

As indicated earlier, the course began with 2,282 course registrants, from which 1,441 registrants were considered active participants in the course during its six-week timeframe. Site statistics from the M4D course provide a snapshot of activity and participation.

A total of 333 participants received either certificates of Competence (244 participants) or certificates of Participation (89).

The top five countries in terms of registrants were India, Nepal, Mauritius, Grenada, and South Africa.

About 500 registrants were from countries in the Africa-Caribbean-Pacific regions. About 200 registrants were from the OECD countries and from East Europe.

### Course Costs

From documents provided to COL by IIT Kanpur the following conclusions were drawn:

COL provided a total of 15,000 in Canadian dollars (roughly the same in USD in 2013).

The bulk of the course costs (just over 75%) were incurred in content development, including costs of recording and editing of instructional videos.

The IITK team provided support for server management costs, which was actually a substantial contribution although they, as a public institution, had not placed a monetary value on IT support.

COL hosted the home page of the course, <http://m4d.colfinder.org> on its server (hosting cost of CAD140). In addition, COL committed support expenses totaling CAD 6,000.

The IITK team added to the course homepage a secure and reliable registration system from which they transferred data in a secure way to the online class site, [www.m4d-mooc.org](http://www.m4d-mooc.org). The transfer process was developed exclusively for this course by IITK, since it involved transfer from Drupal to Sakai for which there were no known solutions. This task required software development and has not been assigned a cost by IITK.

The literature on MOOC development provides estimates of course development and delivery costs between USD 50,000 and USD 250,000 for a single instance of a large-scale MOOC (Porter, 2014). A recent report in the Economist (2014) contains a figure of USD 70,000 as the average cost of a MOOC. These cost estimates suggest that the M4D MOOC was at the very low end of the cost scale for development and delivery.

### Feedback from Students

An online student survey was conducted with students after the course was completed. A total of 208 responses to survey questions were received. For each question, students were provided with a five-point scale on which to provide a numeric answer, with 1 being the lowest rating and 5 being highest. The questions, the student ratings, and averages for numeric ratings are provided in the tables below.

Overall, student satisfaction based on responses was 87 percent, indicating strong satisfaction with the instructors, course content, resources, and delivery format. Clearly, the survey respondents the course Website easy to use (4.38 average rating; 208 respondents); the discussion on forums/chat sessions highly useful (4.06; 207 respondents); the quizzes relevant and well chosen (4.12; 205 respondents); the material clearly presented (4.30; 205 respondents); the course that was delivered was in line with stated objectives (4.40; 207 respondents); the students were highly satisfied with the overall quality of the course (4.45; 208 respondents); and the presenter had a good grasp of the course content (4.66; 206 respondents).

The student survey asked two questions requiring YES, NO, CAN'T SAY responses. First of all, around 71 percent of students indicated they would have taken the M4D course even without certification. Even more impressively, 201 of the 208 survey respondents (i.e., 97 percent) stated they would recommend the M4D course to others. In addition to questions requesting numeric ratings and Yes/No responses, students were provided four open-ended questions that requested a text-based response. The text-based responses from 208 students were coded and clustered as themes in the Porter (2014) report (see Table 1).

**Table 1: Responses to questions requiring a text-based response (Porter, 2014)**

*QUESTION*

*EMERGENT THEMES FROM RESPONSES*

What did you like about this short course?	Course content. Relevance of the topics and case studies. Flexibility of the design.
What suggestions do you have on how we can improve?	Video: Shorter and higher quality video and audio. Assessment: More quizzes.
What did you NOT like about this course?	Intensity of the course. Quizzes had too many technical questions.
What other short courses would you be interested in for the future?	Educational topics: instructional design, applications of mobile technologies for teaching. Agricultural topics: expanded cases studies from other areas of the world. Wireless and network topics Security: cyber-security. Management: knowledge management, technology transfer. Digital media. Entrepreneurship: small business development in rural settings. Health. Finance: micro-finance, cooperatives. Gender: gender equity, gender issues.

## Discussion

The course description, cost analysis, and the results from participant surveys show that the M4D MOOC was an unqualified success. The online delivery arrangement of Sakai, You Tube, and Drupal specially put together for this course worked well. In contrast, a branded MOOC platform would have been a turn-key solution but the costs would have been very high.

During the MOOC, the course sites were accessible in a highly reliable way. They were secure against cyber-attacks that could lead to denial of services. Except for a total of three hours of scheduled maintenance work, the class site was available throughout the duration of the course without interruption. This is part of the quality assurance that self-directed learners expect of any online offering and it was fully met. The schedules for real-time chat events, assignments, and assessments were strictly adhered to. While most learners accessed the course site and learning materials using PC's and laptops, a noticeable proportion (about 10%) used tablets or smartphones. On three occasions, at the request of groups of learners who had difficulty accessing the videos on You Tube, the course managers dispatched the learning materials on DVDs to nodes in Nepal, Sierra Leone, and Zambia. These participants were able to access the assignments and quizzes and the discussion forum areas and eventually received their certificates.

Although originally not planned, tests in the form of online quizzes were introduced based on the demand for such that was raised in the discussions. Also based on opinions and views expressed in the discussions, a few topics were expanded or abridged. Four real-time chat sessions (one every week from the second week of the course) were organised with the instructors using the chat facility. Since participants were distributed in 18 time zones, the instructors located in three different time zones were able to support learners in real time. The quality of content was judged as excellent according to the survey results. Competence of the instructors in their respective domains was also rated high.

Given that MOOC pedagogy is still an emerging area, educators utilizing MOOCs have much to learn from the important insights and practices from the world of ODL and online learning (Sharples, McAndrew, Weller, Ferguson, FitzGerald, & Hirst, 2012). Most of the instructors in this effort were from a research university where standard contact with learners was in the face-to-face mode. However, the instructors were able to adapt surprisingly quickly to the MOOC environment. The IITK course team had conducted a smaller MOOC earlier (Sodhi & Prabhakar, 2014), thereby enabling the team to use the experience for a pedagogically effective design. External evaluations revealed that it was compatible with good practices in online learning (Porter, 2014). Thus, in addition to delivering a highly rated MOOC to students, this effort also helped the faculty members of a research university in a developing country to enhance their skills in designing a MOOC-friendly framework in support of self-directed learning.

### Towards a Model of MOOC for Development

From our experience, it is clear that the MOOC can be unbundled effectively and its components can be purposefully recombined to create an appropriate and highly functional learning space for thousands of learners. Branded MOOCs could become a source of effective practices and do not need to be the sole technology platforms. The elaborate discussion on styles of MOOCs (e.g., cMOOCs and xMOOCs) and pedagogy (e.g., Yuan & Powell, 2014), while academically interesting, is not that applicable to the context of learning for development. Our experience shows that a MOOC4D is a blend of styles and pedagogies dictated by context.

Intensive involvement of the core team of faculty members and support groups in mentoring is critical to the success of the MOOC. Data from learning analytics can be used to ensure that a learner in need of support will receive it in time. Selection of topics is best preceded by a close study of the needs in the milieu of development. The core team should be always prepared to engage learners using cross-media and blended approaches. For example, this team used courier services to deliver content to some learners who were facing challenges in connectivity and online access.

It is important to point out that this was only the first such MOOC for Development course. A few more iterations (COL and IITK, 2014) of this MOOC for Development course are necessary

to provide a more detailed model. MOOC-as-event (not as just an online class) will continue to inform our approach and cross-media approaches to support local needs (for example, phone-in or Skype-in talk shows where feasible). Also important is to embed a research process into the course development and delivery process and identify the lessons learned.

More iterations needed? Well, we did just that. COL and IITK organised a “*MOOC on MOOCs: What you need to know about massive open online courses*” (four weeks in Sep-Oct 2014) where a number of insights and learning from the M4D MOOC were used in the design and delivery processes. The “MOOC on MOOCs” addressed the basics or nuts and bolts of designing and running a MOOC (Perris, 2014). Among the goals for this particular MOOC was to expose the participants to a MOOC as a means for them to see their potential and perhaps later pursue MOOC initiatives within their own areas of expertise or interest. Academics and government officials whose work involves human development issues were directly targeted as well as professionals working in the NGO space (Perris, 2014).

In terms of enrollments, there were 2,347 registrants (93 countries, two-thirds being academics and college teachers, 316 eligible for certificates). As a sign of wide impact from this MOOC, the five countries with the highest enrollments were India, Nepal, Mauritius, South Africa, and Canada (i.e., the headquarters of the COL). Learners were interested in knowing more about MOOCs, with some interested in doing trials on their own. Taking advantage of the global possibilities for MOOCs, guest experts were solicited from around the world to augment and enhance the MOOC on MOOCs course. Besides IIT-Kanpur and COL faculty, there were talks by Sir John Daniel (former President of COL), Dr. Sanjay Sarma (Director of Digital Learning at MIT), and Professor Russell Beale (University of Birmingham and Future Learn, UK; see Chapter 28, this volume) plus education sector leads from Google and Microsoft. In addition, the IITK team designed and built a new MOOC platform called *MOOKIT*. As with the M4D MOOC, participant surveys showed that the course was highly effective while the new platform received a strongly positive rating.

As of time of this writing in late November 2004, COL and IITK are engaged in a new trial of deploying MOOC technology to train semi-skilled gardeners in the basics of modern horticultural production techniques through the *delivery of an audio-only course* (four weeks). Given the modest level of literacy of the intended audience and the known inability to make use of the Web to access learning materials, a platform to deliver materials in an audio format (in this case, Hindi) and to receive queries and responses has been developed and deployed. There were 1,075 registrants in this course at the time it started, almost 90% of whom were gardeners and subsistence farmers. Suffice to say, with such response and participation, many of key goals for MOOCs for human development are being more than met.

It is important to point out that many development institutions and national governments accept skills development as a policy priority (Aggarwal & Gasskov, 2013). Rather than immediately influencing the higher education sector, MOOC for Development as a support technology is

likely to be useful in faster diffusion of intermediate skills on a mass scale (COL, 2014c). A series of trials and prototypes are necessary to determine the nature and extent of blending MOOCs with existing approaches related to quality assurance, assessment, certification, and credentialing.

In MOOC for Development practice, online educational materials and resources are likely to be a core technology rather than the sole technology (similar to e-commerce practices in many developing countries where it is possible to place an order online and make the payment at a bank counter or through a post office). Inadequacies in pedagogy in MOOCs need to be addressed through specially designed trials. In all these matters, open and distance learning organizations, COL's primary constituency, would be able to contribute effective strategies from years of well-established practices.

There is a rising interest of political leadership in MOOCs including places like India (Prime Minister's Office, 2014). Government offices are interested in how MOOCs might enhance literacy skills, health awareness, and economic development as well as serve as a channel for youth engagement. As such interests result in success stories, we should expect to see wider and faster development of MOOC for Development models.

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