

Value creation framework to assess MOOC-based learning

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Abstract

Massive Open Online Courses (MOOCs) have the potential to scale up and democratise participation in professional education. Medical advances and growing demand for health providers require adoption of new flexible, team-based and lifelong learning approaches beyond the current “silo” medical training model focused specific professional roles. MOOCs provide opportunities to address pressing global health training challenges through collaborative development and globally networked learning environments. This project considered the extent to which individuals could gain and apply their learning from a global health MOOC within their local contexts.

In 1996 the World Health Organization launched the international initiative ‘GET 2020’ to eliminate trachoma, an avoidable blinding eye disease, across 44 endemic countries. In 2016, 16 London School of Hygiene and Tropical Medicine (LSHTM) staff and 37 collaborators from 12 countries developed the first MOOC in “Eliminating Trachoma” aimed at improving access to training, equipping and mobilising health workers, to achieve ‘GET 2020’. Over 5000 people have participated in the MOOC from a diverse range of professional cadres and disciplines, including clinicians providing surgical services, programme managers, field workers administering antibiotics, and teams implementing water and sanitation improvements.

We adapted a ‘value-creation framework’ to evaluate the impact of MOOC-based learning on trachoma elimination practices at the local level. Online surveys were designed to capture personal experiences of ‘cycles’ of value creation during participation in the MOOC and after the course. The results provide unique and emergent insights into the ongoing value of the MOOC experience for respondents, their teams and the communities affected by trachoma with whom they are engaging towards the goal of elimination.

Introduction

Co-designed and collaboratively produced Massive Open Online Courses (MOOC) offer the potential to scale up professional development through the provision of social and interactive learning opportunities in flexible ways. Professional participants can engage in a community or networks with peers, subject experts and a range of stakeholders. For professionals, however, learning also needs to be applied and its value realised in practice. The potential of social learning outcomes gained through MOOCs therefore, needs to be examined through a wider lens, which examines not only the value of learning for the individual participants, but the extent to which they can learn from each other, apply their learning to benefit others, and connect to a broader network to create influential and collective change (1).

This paper reports on an evaluation of LSHTM’s first MOOC in ‘Eliminating Trachoma’ (ET MOOC) delivered through the FutureLearn platform. Trachoma is an infectious and an avoidable blinding eye disease, which remains endemic in 44 countries, affecting over 142 million people in some of the poorest communities. In 1996, the WHO launched “GET 2020”, an international initiative with the mandate to support implementation of the recognised public health interventions of the “SAFE” strategy, which means Surgery for advanced eye disease, Antibiotics for infection control and Facial and Environmental cleanliness. “GET 2020 is a partnership which supports country implementation of the SAFE strategy and the strengthening of national capacity through epidemiological assessment, monitoring, surveillance, project evaluation and resource mobilization.”(2)

As 2020 approaches, the need to scale-up these activities has intensified. Strengthening, training and equipping health workers to achieve this goal is pivotal to its success. Across many countries, training challenges include few educational opportunities, lack of trainers and limited or outdated resources. Many small training workshops by trachoma experts in multiple locations have been organised but this approach is costly to both provider and recipient in terms of finance and time, and limited in terms of scope of the learning process, within a fixed location and time and small groups.

MOOCs, Open Educational Resources and Open Educational Practices (3) provide an opportunity to address global health training challenges such as faced in eliminating trachoma: increasing access to quality training scaling training in public health for trachoma to a global audience of learners in remote settings online; reaching beyond institutional boundaries to offer training to health workers who might otherwise not be able to engage in learning opportunities; and sharing high quality resources with educators, enabling further use, sharing and adaptation of the training in specific local contexts.

The ET MOOC provided an innovative opportunity to bridge the existing gap in access to knowledge, collate expertise and guidance into one course and develop a learning design that was relevant for a wide range of practitioners (ranging from surgeons, water and sanitation experts, community health workers and Ministry of Health stakeholders) involved in the delivery of the SAFE strategy. This meant moving away from the “one size fits all” approach within our social learning design and integrating distinct practitioner voices alongside the perspectives from global experts and using the MOOC platform to extend interactive learning. Facilitation within MOOCs provides an additional tool for connectivist pedagogy (4) by creating networking opportunities. In this course this meant bringing global experts from the WHO, international NGO sector, GET 2020 consortium members and researchers together with local practitioners and educators working in eliminating trachoma. Further facilitation was also provided through Google hangouts where expert panels discussed and expanded on questions and topics raised within the course discussions.

Health related learning designs aim to enable learners to develop reflective and critical enquiry whilst understanding and assessing available guidance. The challenge in developing the ET MOOC content was maintaining relevance across a wide range of practitioners: specialists in eye surgical procedures, coordinators for mass antibiotic distribution and leadership for the development of infrastructure for water and sanitation. Development of videos and articles were supported by discussions to enhance peer and inter-professional engagement, and linked back to narratives and stories from trachoma endemic communities for purposive relevance.

To date the ET MOOC course has had 5,359 unique enrolments and been accessed by 2,803 unique learners representing 151 countries and territories. 1,216 learners were from trachoma endemic countries and the course reached 38 of 44 trachoma endemic countries in total. This project was established to explore whether the learning gained from MOOCs provided the relevant knowledge capital for application at a local level, in the delivery of the SAFE strategy.

To gauge our success, however, we developed a methodology to examine the different ways the MOOC created value for participants and their professional contexts. A value creation evaluation process (5) was selected to provide a conceptual foundation, based on participant narratives arising from social learning activities and meaningful integration in their own context. A rigorous but flexible approach for data collection within a MOOC was essential. The value creation analysis of the learning experience and perspective was defined within a framework (6) of five cycles of value creation: Immediate (engagement), potential (knowledge gain), applied (changes in practice), realised (improved performance) and transformational (redefined success). To ensure validity and reliability, data was mapped across the five cycles, guided by relevant indicators across each cycle but recognising that the expected value cannot always be defined in advance.

The aim was to determine if the social learning experience gained from the ET MOOC provided a value within a local context.

Methods

The evaluation tools were used to answer the following research questions:

- Who, where, why and how did individuals participate in the course?
- Was the course accessible and relevant for each of the different healthcare cadres working in trachoma?
- Did acquisition of knowledge occur?
- Did the course activities support application in the local context for individuals and educators?
- What was the impact of the learning on the individuals, teams, communities in their roles and ultimately the impact on those affected by trachoma?

Data collection tools and methods

Existing methodologies and metrics within MOOCs provide generic platform level ‘snapshots’ of the learners’ experience and perceptions of value, for example through level of engagement and ‘satisfaction’ score. To truly assess the impact of the ET MOOC it was key to evaluate learners’ specific experiences during and after participation in the course. To obtain this, a bespoke ‘Value Creation Framework’ (VCF) was developed for the ET MOOC (see Fig. A) adapted from the original framework described by Wenger & Trayner (5). Data collection was carried out using online surveys and phone/Skype interviews.

Fig. A: Bespoke Value Creation analysis framework

Cycle 1 Immediate value	<p>What happened during participation?</p> <ul style="list-style-type: none"> ● Level and kinds of participation: ● Quality of interactions ● Use of resources ● Networking ● Personal value of MOOC learning ● Barriers
Cycle 2 Potential value	<p>What changed as a result?</p> <ul style="list-style-type: none"> ● Skills and/or knowledge acquired/ confidence ● Change of view ● New social connections ● Experience with online learning ● Barriers
Cycle 3 Applied Value	<p>What difference has participation made?</p> <ul style="list-style-type: none"> ● Use / reuse of skills, knowledge, connections or materials from the course ● For trachoma elimination or in another personally relevant sphere ● Barriers/ enablers
Cycle 4 Realized Value	<p>Is there evidence of sustained difference to self-ability or to an eliminating trachoma programme?</p> <ul style="list-style-type: none"> ● Increased effectiveness or quality or outputs ● New achievements ● At personal or organisational levels ● In trachoma elimination or other in another personally relevant sphere
Cycle 5 Transformational value	<p>Has understanding of what is important changed directly because of the course?</p> <ul style="list-style-type: none"> ● At personal or organisational levels

Two surveys were designed, one for MOOC participants and a separate survey for stakeholders. The surveys were created using the 'JISC Online surveys' platform. Survey questions for MOOC participants encouraged reflective thinking about the learner's journey and answers were mapped across the five cycles of value creation - immediate, potential, applied, realised and reframing value. Questions for stakeholders asked them to appraise the value of the MOOC, across the same five cycles, from the perspective of the organisation they represented and their involvement as facilitators on the MOOC.

The data collection process was negotiated with the MOOC platform provider. An email which outlined the study objectives and provided a link to the survey, was forwarded by FutureLearn, to every person who registered for the Eliminating Trachoma MOOC (>5000 individuals), inviting them to complete the survey. FutureLearn contacted participants on behalf of the research team, as required by their data protection policy and GDPR regulations, which prohibited direct contact with MOOC participants. Representatives from international organisations partnering in GET 2020 (The WHO, Fred Hollows Foundation, Carter Center and MOH Kenya), were contacted directly and invited to participate in the process as stakeholders.

MOOC participants were invited to share their email address at the end of the survey, if they consented to a follow-up interview to discuss their survey responses in more detail. The purpose of the interviews was to capture 'value-creation stories' to complement the survey responses. Interviews were also held with each of the stakeholders (however, this analysis is not included in this paper).

Data analysis

Data from the surveys was analysed using both quantitative and qualitative methods. The data was coded and all responses entered into Excel. The team of three researchers analysed the results of the MOOC participant survey in two ways, horizontally for participant narrative and vertically on collective dimensions against the bespoke VCF framework (Fig A). To promote reflexivity during analysis and trustworthiness of the findings (7), the three researchers double coded each analysis and met to discuss and resolve areas of divergence or disagreement.

- Horizontal analysis

For each respondent the team assessed whether the respondent had experienced value creation - whether personal or relevant to the GET 2020 goal of eliminating trachoma - across the 5 cycles of the VCF framework. Each answer to quantitative questions in cycles 1 to 3, which indicated a positive value gain, was scored as 1 point and free text answers across all 5 cycles were individually assessed against our customised VCF framework. The quantitative score and qualitative assessment were then combined to inform a final 'Yes' or 'No' decision by the research team as to whether each respondent had experienced value creation in a particular cycle. This analysis summarises complex, personal and time based experiences of respondents to engage with and learn from the course, reflect on and apply their learning during and after the course.

- Vertical analysis

The team also carried out a qualitative thematic analysis of the 'free text' answers to questions. This involved immersion into the comments and assigning them to the various cycles. Further immersion into each cycle was undertaken to extract meaning and themes relating to each cycle of the VCF. This data and the researcher triangulated analysis ensured trustworthiness and reliability.

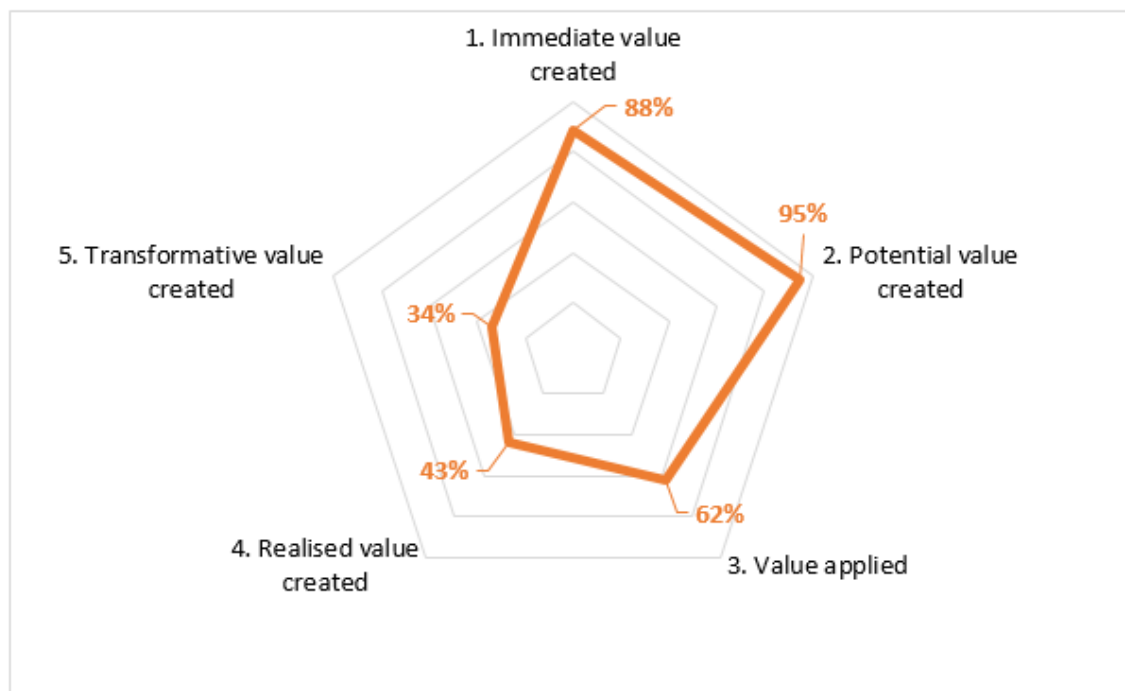
The methodology and surveys were approved by FutureLearn and ethical approval was obtained from the London School of Hygiene & Tropical Medicine.

Results

76 MOOC participants completed the online survey between September and December 2018 (14 weeks). Most respondents worked in eye care (84%) and reported that they had completed the course (89%). Nearly two thirds (63%) worked in a trachoma endemic country and just over half (53%) worked directly in trachoma elimination.

Nearly all respondents reported gaining immediate and potential value from participating in the MOOC (88% and 95% respectively) as shown in Fig B below. The data is presented to show performance across each of the cycles as well as the supportive qualitative key themes that were derived from responses.

Fig B. Reported value creation across all 5 cycles.



Cycle 1 - Immediate value theme: Inspiration and relevance

Respondents valued the direct involvement with MOOC activities and peers on the platform.

- “The Video Lectures and interactions with peers from other countries” [S04]
- “The practical sessions on actual field experiences (in Trachoma) as shared by the facilitators” [S38]

The course provided a complete overview of all the ‘SAFE strategy’ activities undertaken in a country to eliminate trachoma and respondents valued the relevance of the information as a trigger for reflection on their personal understanding of the subject matter.

- *“The most influential and inspiring aspects of the course was assessing the natural history and clinical signs of trachoma, planning and coordination of trachoma mapping at district and community level.”* [S53]

How respondents reported interacting with the course varied: 37% primarily interacted through videos and quizzes and 30% never contributed to discussions.

Cycle 2 - Potential value theme: Increased confidence

Nearly all the respondents (95%) recognised the potential value of the MOOC for them. They highlighted how the quality of the course increased their confidence in participating and in online learning as a new professional development option:

- *“We are learning from the best in the field”* [S56]
- *“Participation in the course has changed my view of the value of online learning for myself and in my setting”* [S31]
- *“[...] online course, which more or less fitted with my working pattern”* [S60]

Respondents also identified how what they were learning resonated with, and led them to reflect on, their own practices in eliminating trachoma. They expressed increased confidence in the context of skills gained and new ideas generated.

- *“I now understand more of the mapping and epidemiology of trachoma, so have a broader perspective within my professional role”* [S60]
- *“My participation has helped me to be able to interpret, and elaborate for the local setting, each of the SAFE strategy components to manage and control trachoma...”* [S36]

Learning how to build relationships and connections within their teams and communities also gave respondents confidence. The GET2020 programme recognises a community and team led approach as vital for the effective elimination of trachoma.

- *“Knowing how to work as team and interaction with other Eye care providers is crucial”* [S07]
- *“I learnt new ways of engaging community for the control of trachoma especially the S and A components of the control”* [S24]

Cycle 3 - Applied value highlighted a distinct change in practice

Almost two-thirds (62%) of respondents reported applying their learning – leveraging, adapting and using their new knowledge, skill, resource or connection to accomplish a task. Application value increased to 73% for respondents based in a trachoma endemic country (see Fig C).

The findings highlighted two major themes within this cycle.

A. Involvement in activities for the control of trachoma

The ability to engage with activities and level of application ranged from undertaking specific tasks such as *“conduct impact survey”* [S05] or *“Writing the dossier”* [S11] to more extended roles and responsibilities, such as:

- *“I applied the ideas to local context in my community work, such as TT [Trachomatous trichiasis – which is in-turned eyelashes from trachoma] case-finding approaches and CDD [Community Directed Distributors] selection and supervision”* [S04]
- *“Programming for surgical outreaches and planning for transition among others”* [S04]
- *“At an organisational level ... to contribute accurate, up-to-date language on trachoma to an organisational messaging toolkit”* [S60]

B. Transferral (reuse) of learning and practice to local networks

Respondents shared what they had learned within their local contexts:

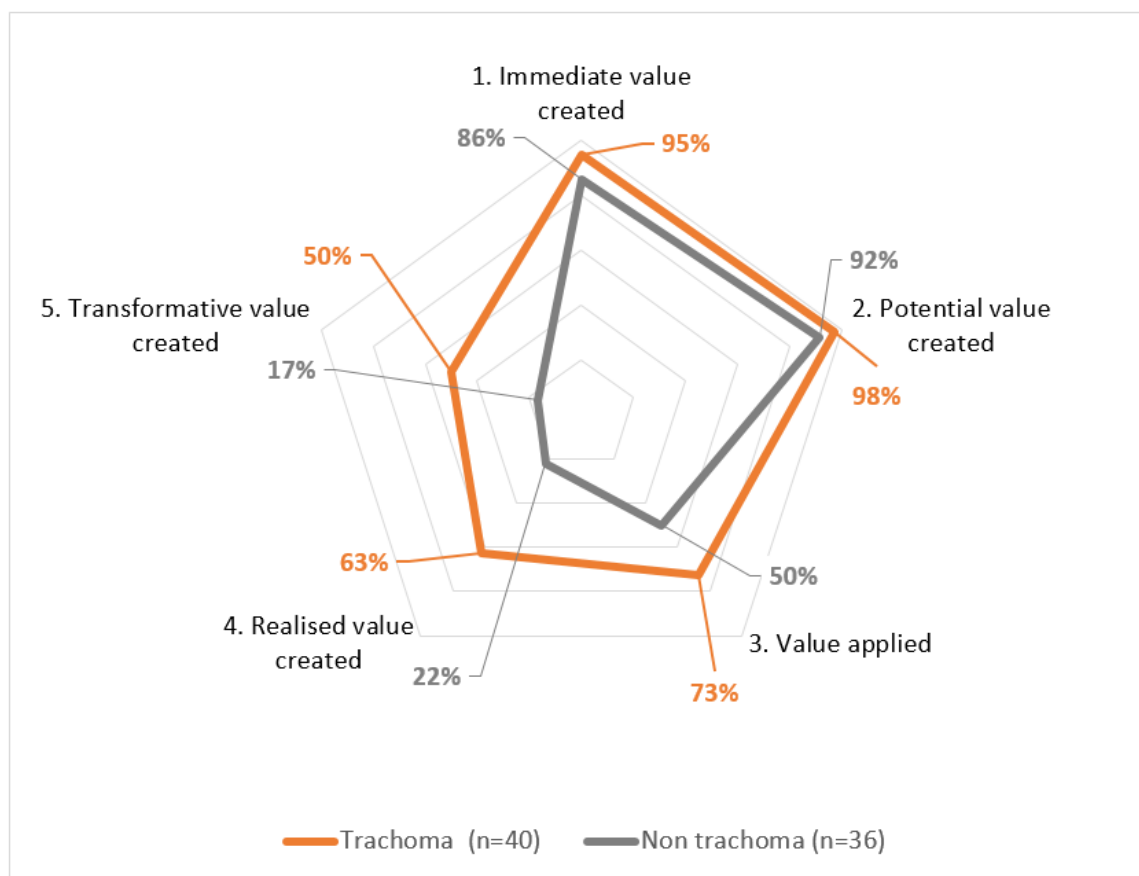
- *“we were able to share the knowledge with the health educators, district health team and supported in sensitization of communities on F&E.”* [S52]

And used their new knowledge to improve their knowledge sharing practice:

- *“My lectures for medical students became more focused, and talks for Mid-Level Ophthalmic Personnel were simplified”* [S33]

Application was possible as a transition from being confident with the course content and their overall ability to engage with it in an online forum. This experience highlighted a willingness to share knowledge capital as a flexible resource and for the collective good (social capital).

Fig C. Percentage of respondents working or not working in trachoma elimination who reported value creation in each cycle from the course (n=76)



Disaggregating the results by whether the respondent worked in a trachoma endemic country (n=48), eye care (n=64) or trachoma elimination (n=40, see Fig C) revealed similar patterns of increased value gain across the five cycles especially in cycles 3, 4 and 5 amongst the MOOC’s target learners. This suggests that the MOOC is most relevant to, and applicable by, the intended audience in trachoma endemic countries.

Cycle 4 - Realised Value responses provide an insight into changes in self-ability and difference at programme level. Reported realised value was particularly strong and specific from respondents in trachoma endemic settings. The key theme was performance improvement as improved outputs, new activities or new achievements, both in personal practice and more broadly within a programme:

- “More TT [trachomatous trichiasis] cases are found and managed” [S06]
- “I’m more effective particularly for reporting on progress towards elimination and the activities and approaches needed for elimination” [S60]
- “surgical failure identified and provided refresher training” [S70]
- “The Course contributed to my change of Job from TT Surgery Project Officer with local NGO to MDA Coordinator [...] at the Federal Ministry of health [...] and also contribute to the programming of other SAFE components.” [S04]

Respondents also repeatedly expressed recognition of the value of output quality:

- “[This course] help me to achieved the set and required therapeutic coverage” [S36]
- “Quality of my analysis and ability to critique or advise on the work of my organisation on trachoma” [S50]
- “Annual presentation on trachoma elimination to colleagues.... I hope, helped them understand more about trachoma, use accurate data and ensure that language is clear and correct” [S60]

Cycle 5 - Transformative value

Half the responses from trachoma endemic regions identified having reframed their goals and approach after participating in the MOOC. The two main themes found were around the aspirational reframing of practice at the personal and community levels.

A. Reframing of activities for control of trachoma:

- *“More clarity on the importance of F&E [Face washing and Environmental cleanliness], particularly behaviour change. More clarity on the importance of data to drive decisions about project design and implementation.”* [S60]

B. A recognised shift from a previous position:

- *“I no longer think of outputs but outcomes as significant in elimination of trachoma”* [S08]
- *“the critical importance of education of all involved in achieving a public health goal including the public”* [S47]

Discussion

The ET MOOC had a global reach but more specifically engaged participants amongst 38 countries out of the 44 countries where Trachoma is endemic, providing scalability over traditional models of training through workshops and paper-based trachoma practice guides and a step towards democratising access to quality education (9).

The collaborative course design brought all the SAFE components together, allowing practitioners the flexibility to understand and engage beyond their own specific role. The focus on the 5 value cycles of value creation provided a strategy to evaluate the social learning design of the ET MOOC and its influence on performance outcomes and subsequent behaviour. Success within each cycle had to be considered on its own terms and not as one cycle leading to another. Nor was achievement only attained if the participant reached the final cycle (transformative value).

In this study, the patterns of achieving value creation across the cycles varied considerably amongst all participants, but there were distinct differences in cycles 3, 4 and 5 – application of value, realised value and transformative value - between participants in trachoma endemic and non-endemic regions.

The high levels of value creation in cycle 1 - immediate value (88%) and cycle 2 - potential value (95%) indicated engagement with activities within the MOOC and acquiring of knowledge capital. When considered through the lens of a facilitator this indicates successful outputs from the course content and design. For stakeholders, this contributes to justifying the use of the MOOC format, compared to individual training workshop models, as the MOOC provides opportunity to engage in a high quality learning experience alongside scalability and flexible delivery. Interestingly, 30% of respondents reported never actively participating in discussions and 37% only interacted through videos and quizzes. An important affordance of MOOC learning may be the flexible support for both active and passive social learning.

Priority and perspective of value varies between participants across the cycles. The higher application and realised values shown by respondents in trachoma endemic regions is a relevant outcome for the network and community. The informal and flexible social learning within the MOOC, promoted reuse and sharing of resources with confidence. This attributes a proxy value to the knowledge and resource capital gained from the course content and interactions with it.

Cycle 5 on transformative or reframing value demonstrates deep learning and critical reflection. The insights shared by respondents indicated that meaningful connections were being made from the MOOC learning experience, content and wider network.

The online value creation data collection tool provided a rich matrix of perspectives within the confines of the indicators for each cycle. On its own, this method may be insufficient to fully reveal salient indicators that point to further narratives or additional value created. Interviews with respondents have been undertaken, to further enrich our understanding and will be reported elsewhere.

However, the evaluation of a MOOC highlighted a number of challenges regarding the regulations surround platforms and access to participant data as well as detangling the complex picture obtained from metrics.

In this project, the data collection tool could only be disseminated through collaboration with the platform provider, and limits our understanding of the overall coverage or impact on responsiveness from the participants. In addition, tracking the achievement of learning outcomes using metrics exclusively within MOOCs is unpredictable, in terms of the range of participants, their interactions and connections with activities and peers (8).

Assumptions made about the learning process at the design stage of a MOOC may also be very different to the learning that may take place. Learning is not a linear process connected with knowledge expansion and direct application (5).

Conclusion

Findings from the evaluation of value creation provide an insight of the performance outcomes and patterns that arise within the context of social learning from a MOOC. The particular strength of the ET MOOC was the overarching common goal that provided a direct relevance to learners' local contexts. The cycles uniquely provided a way to explore the question of "value to whom" amongst the diverse outcomes possible from the open and flexible nature of MOOC learning.

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