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Participant Experience of the First Massive Open Online Course (MOOC) from Pakistan

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PARTICIPANT EXPERIENCE OF THE FIRST MASSIVE OPEN ONLINE COURSE (MOOC) FROM PAKISTAN

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ABSTRACT

Background: In recent years, massive open online courses (MOOCs) have steadily gained popularity. It appears, however, that MOOC learners are concentrated mostly in the affluent English-speaking countries. MOOCs' free-of-cost, easy accessibility should make them obviously attractive to participants from low-and-middle-income countries (LMIC). The reason why LMIC enrollments in MOOCs are so low is therefore unclear. In the year 2014, the first MOOC was launched from Pakistan. We administered a survey to the enrollees of this MOOC to explore concerns, fears, and limitations that might be deterring the LMIC audience from participating in MOOCs.

Methods: The MOOC was a three-week course on bioinformatics that covered current concepts and techniques employed in the area of computer-based drug design. More than 230 participants enrolled for this course. At the end of the course, to examine the MOOC experience from their perspective, we invited the participants to take an online survey.

Results: Fifty-four participants, mostly from Pakistan, completed the survey. The participants reported satisfaction with the course, and felt that the course participation was an enriching experience. Although they appeared eager to explore MOOC learning, we found that the learners from LMICs may not be completely comfortable with various aspects of online learning.

Conclusion: Our results indicate that there is a definite market for MOOCs in LMICs. Computer accessibility and literacy must be enhanced in the LMICs to allow the citizens of these regions to feel comfortable with e-learning. Moreover, LMIC nations acknowledge their own unique learning cultures and experiences when they produce and share their MOOC offerings with the world.

KEYWORDS: Massive Open Online Course (MOOC), LMIC, Pakistan, Biochemistry, Bioinformatics, Instructional Media Design, Structural Biology

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BACKGROUND

In recent years, e-learning has steadily gained popularity in academia (Mulder & Janssen, 2013). Starting in the early 2000s, massive open online courses (MOOCs) were initiated by certain major American and European universities (Mulder and Janssen, 2013; Bayne, 2015; Aboshady, 2015). Free online learning and open enrollment for all has been an integral part of the MOOC philosophy (Esposito, 2012; Suen, 2014; St Clair et al., 2015).

Aside from affordability, MOOCs offer wide accessibility to participants all over the world (Sandeen, 2013; Freitas, 2015). These features have added a great deal of appeal to MOOCs, especially for students for whom travelling to and enrolling with major universities is a challenge. Provided learners have Internet access, they are able to participate in any MOOC regardless of their economic limitations, geographical boundaries, and time zone restrictions (McAuley, 2010).

For the reasons cited above, and especially in light of financial constraints, participants from Low and Middle Income Countries (LMIC) should find MOOCs particularly appealing. However, learners as well as teachers of MOOCs are concentrated mostly in affluent English-speaking countries (Waldrop, 2014). To date, very few MOOCs have been offered from LMICs; in Asia, only China, Indonesia, India, and Malaysia have initiated MOOCs (Wilson & Gruzd, 2014).

In 2014, from the platform of Aga Khan University, Karachi campus, a MOOC was launched from Pakistan. This was a three-week course titled, "Drug Discovery – a computer-based approach." The MOOC covered current concepts and techniques used in computer-based drug design. The course attracted 230 enrollments including undergraduate, graduate and post-graduate students, healthcare professionals, researchers, and university faculty.

In this study, we have examined the Drug Discovery MOOC experience from the learners' perspective. Using data gathered through an online survey, we have analyzed how participants viewed this MOOC initiated from an LMIC, what concerns and expectations these participants identified, and what might be the factors deterring a potential LMIC participant from enrolling in a MOOC.

METHODOLOGY

MOOC AND POST-MOOC ONLINE SURVEY

The Aga Khan University-based MOOC was a three-week course on bioinformatics that covered current concepts and techniques used in computer-based drug design in which participants could participate at no cost. However, the course also offered a Certificate Track, wherein registered participants, after covering nominal processing charges and completing all course-related tasks and quizzes, could obtain a university-verified certificate. Regardless of whether a MOOC participant had enrolled in the Certificate Track, each participant who completed the course received an invitation to take an online exit survey. In addition to collecting basic information about the course participants, such as age, level of education, country, level of education, income, and so forth, the survey explored the factors that determined their fears, concerns, and limitations and played into their decision for enrolling in this MOOC. The survey also enquired into the participants' expectations and concerns for a MOOC originating from an LMIC. Of the 230 participants who enrolled in the MOOC, 53 participants completed the survey.

Prior to the commencement of this study, ethical approval was obtained from the Ethical Research Committee, Aga Khan University, Karachi, Pakistan.

RESULTS

PARTICIPANT PROFILE

All but three participants who took the course survey were from Pakistan; the remaining three were from India, South Korea, and Mexico (See Appendix, Table 1). Most survey participants were between 20-29 years of age (n=32). Almost twice as many survey respondents identified themselves as female participants (n=35) than those who self-identified as male participants (n=18). Most MOOC participants who participated in the course survey listed their occupation to be that of student (n=22), while fewer survey respondents indicated they were faculty members and/or researchers (Table 1).

PARTICIPANT LIMITATIONS

Survey participants were asked to indicate their source of course information. Survey participants (n=23) most frequently indicated they came to know about the course through their teachers, colleagues or friends, while email came second as the source of course information participants selected (See Appendix, Table 2). Most survey participants (n=44) did not register for the Certificate Track, indicating they did not do so because they did not have the time to complete all the course assignments (n=17) or were simply not interested in obtaining the course certificate (n=13). Approximately 52% of the survey respondents lacked prior experience with online courses. The majority of the participants had access to a computer and the Internet at their home, and reported no difficulty in using these facilities. A good number of participants also reported being hampered by inconsistent electricity supply (n=22) and restriction on educational websites (n=11) in their country (Table 2).

REASONS FOR ENROLLING IN THE MOOC

The majority of the survey participants (n=37) indicated they had enrolled in the course because they wanted to learn about the subject area in which the course was offered (See Appendix, Figure 1). Other reasons for which the participants enrolled in the course included that they were curious about the course, that they wanted to explore a MOOC offered from a developing country, or that they simply wished to experience an online course (Figure 1).

PARTICIPANTS' CONCERNS AND FEARS ABOUT THE MOOC

Since this was the first MOOC offered from an LMIC, namely Pakistan, we wanted to explore what fears or concerns the participants had before enrolling for this MOOC. Interestingly, the participant response showed that the majority were indifferent to the fact that the MOOC was being offered from an LMIC (See Appendix, Figure 2). Conversely, the majority of the participants anticipated that the course delivery would be effective, the course would be of high quality, and the course material would be up-to-date. Survey participants also indicated that, before enrolling in the course, they held positive expectations about the competency of the course faculty (Figure 2).

PARTICIPANT EXPERIENCE OF THE MOOC

Fifty-three participants who took the survey were asked to share their experience about the following four different aspects of the MOOC, shown in Figures 3A-3D (See Appendix).

- course workload (Figure 3A)
- course design and execution (Figure 3B)
- course faculty (Figure 3C)
- participant's learning experience (Figure 3D)

The majority of participants (n=35) responded that the course involved a heavier work load and a great deal more self-directed learning than they had anticipated (n=24) (Figure 3A).

While commenting on course design and execution, the majority of the survey participants indicated they thought that course design was appropriate (n=50), that the course website was visually appealing (n=49), and that it was well organized and easy to use (n=50). A small number of survey participants indicated that participation in the course was technologically challenging for them (n=16) (Figure 3B).

The majority of the participants were satisfied with the quality and delivery of the course (Figure 3C). Participants unanimously thought that the course faculty member was engaging, and competent in the subject area (Figure 3C).

Overall, survey participants reported having been satisfied with the course (Figure 3D). They indicated that course participation was an enriching experience, and that the course enhanced their knowledge in the subject area. The survey participants also noted that the Drug Discovery MOOC inspired them to take more courses in the subject area, and to apply this knowledge in their research (Figure 3D).

DISCUSSION

In the current study, we have examined the learners' experience of the Drug Discovery online course, the first MOOC to be launched from Pakistan, to date. Using data from an online administered survey, we have analyzed certain aspects of this LMIC-initiated MOOC from the participants' perspective, taking into account their limitations, concerns, and expectations related to participation in this course.

With the advent of the Internet age and its ever-increasing popularity in developing countries, for example in LMICs, MOOCs are thought to hold great promise for promoting public access to quality education (Liyanagunawardena et al, 2013; Castillo et al, 2015). However, most of the MOOC-offering institutions are centered in English-speaking parts of the Western world. Additionally, MOOC participants appear to be located mostly in North America and Europe, with very little representation from Asia, and even less from Africa (Liyanagunawardena et al., 2013; Liyanagunawardena, 2012).

In the Drug Discovery MOOC, all the enrollees except one were from LMICs. This information was encouraging since it showed that an LMIC-initiated MOOC was able to attract enrollments from the developing countries. As noted above, most course participants were graduate students, followed by faculty and researchers. Moreover, survey participants with these occupations reported they had access to computer and the Internet, and were comfortable

using these facilities. Such a level of access to, and literacy with, technology might not be reflective of the general population in an LMIC. However, the data from this study do suggest that members of the population interested in attending online courses are well-equipped with the prerequisites, both technologically and intellectually. While this observation raises a point in favor of developing further MOOCs from and for the LMICs, it also makes an argument for spreading computer literacy throughout the developing world, including the far-flung and impoverished populations of LMICs. Studies have identified that most MOOC participants from developing countries are located in urban centers with access to computers and the Internet. The lack of technological infrastructure, including computer access, Internet connectivity, and electricity supply are some of the major impediments for prospective MOOC participants from the rural areas (Liyanagunawardena et al., 2013; Liyanagunawardena, 2012; Marcial et al., 2015).

Most of the Drug Discovery MOOC participants did not register for the Certificate Track because they either did not have the time to complete all the course assignments, were not interested in obtaining, or could not afford to obtain, the course certificate (as shown in Table 2). While on one hand the participant response indicates their limitations, on the other it reflects positively on their learning philosophy: Most of them did not care about certification but were simply interested in gaining the knowledge. This is again a reminder of how MOOCs, due to their free-of-cost dissemination of knowledge, can be genuinely attractive and beneficial to an LMIC participant.

MOOCs throughout the world have been reported to have low retention rates (Liyanagunawardena et al., 2013; Greene et al., 2015; Zeng et al., 2015). Little is known about the reasons for low retention: One observation is that most of the MOOCs generate an overwhelming amount of information in the form of course materials, which creates difficulty for the participants to maintain full engagement (Liyanagunawardena et al., 2012; Koutropolous et al., 2012; Koutropoulos & Zaharia, 2015). Accordingly, most of our MOOC participants also did not complete the course to the end. One reason for this may be that online learning is a relatively new form of teaching and learning in Pakistan, a delivery format with which students are not yet very familiar. Indeed, while the survey participants reported their satisfaction with the course delivery and website (Figures 3B-C), our course survey also revealed that the participant responses were rather evenly split regarding perceptions of the amount of time, effort, digital literacy, and self-directed learning learners had anticipated would be required for the Drug Discovery course (Figure 3A). In line with these observations is also the fact that half of the MOOC respondents had never taken an online course before (Table 2). On the whole, online teaching and learning is a new phenomenon in these regions; for this reason, students may not have yet

developed the skills required for online learning (*Self-Directed*, 2013; Oyo & Kalema, 2014). These data emphasize that digital and self-directed learning, two important and essential components of MOOC participation need to be adopted widely in LMIC academia so learners will find themselves more at ease with this format of learning and be able to benefit more effectively from online courses.

Our survey revealed that, overall, the participants were satisfied with the course. They thought that course participation was an enriching experience, and that their knowledge in the subject area increased after attending the Drug Discovery MOOC (Figure 3D). Information that came as a pleasant and encouraging surprise was that the majority of the Drug Discovery course participants were indifferent about the fact that the MOOC was being offered from an LMIC. Despite its LMIC-based patronage, the participants anticipated the course delivery would be effective, and had favorable expectations of the course quality and content, and competence of the course faculty (Figure 3C). This information should serves as reassurance to LMIC institutions that have reservations about developing online courses. From the example of the Drug Discovery MOOC it appears that the prospective LMIC-based MOOC participant is more mature than we might have believed, is more interested in gaining knowledge, and is less worried about from where a MOOC is coming.

In conclusion, the launch of the first MOOC from Pakistan heralds promising news. From this experience we learn that the environment in the LMIC academia is ripe for online learning. The prospective LMIC MOOC participant is eager to partake of resources that are time- and cost-efficient, and are effective in enhancing knowledge and skills. However, to make the future MOOC experience more rewarding it is imperative to spread computer literacy more widely in the LMICs. Moreover, LMIC nations such as Pakistan acknowledge their own unique learning cultures and experiences when they produce and share their MOOC offerings with the world.

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APPENDIX

TABLE AND FIGURE LEGENDS

TABLE 1: PARTICIPANT PROFILE: Basic information about the participants of the Drug Discovery MOOC.

TABLE 2: PARTICIPANT PREFERENCES: Information about the participants' enrollment in the course and registration for the certificate track. The table also provides information about technological limitations of the survey participants in terms of the availability of, and proficiency with, computer and Internet, etc.

FIGURE 1: REASONS FOR PARTICIPATION: The X-axis shows the participants' reasons for attending the Drug Discovery MOOC, while the Y-axis shows the number of participants and their response to each query.

FIGURE 2: CONCERNS AND FEARS: The X-axis shows the fears and concerns that the course participants might have anticipated before attending the Drug Discovery MOOC. The Y-axis shows the number of participants and their response.

FIGURE 3: EXPERIENCE OF THE DRUG DISCOVERY MOOC: The figure shows aspects of participant experience after attending the MOOC. The information is divided into four categories: A) course workload, B) course design and execution, C) course faculty and, D) learning experience. The X-axis shows the aspects of participant experience, while the Y-axis shows the number of participants who responded.

TABLE 1: PARTICIPANT PROFILE

Parameter	Category	Number of Participants
Age	20-29	32
	30-39	15
	40-49	4
	50-59	2
Gender	Male	18
	Female	35
Country of Residence	Pakistan	50
	India	1
	South Korea	1
	Mexico	1
Occupation	Student	22
	Faculty and Researcher	15
	Medical doctors and Pharmacist	8
	Laboratory and Administrative Staff	3
	Engineer	1
	Unemployed	2
	Undisclosed	2
Highest level of education	High School	5
	Undergraduate	17
	Graduate or above	31
Yearly income (in US $)	0-100	8
	100-500	2
	500-1000	2
	1000 and above	8
	Prefer not to respond	33

TABLE 2: PARTICIPANT PREFERENCES

Parameters	Category	Number of Participants
Information about MOOC	Email	18
	Flyer on notice board	4
	Teacher, colleague, or friend	23
	Facebook	6
	Aga Khan University website	9
Registration for certificate Track	Yes	9
	No	44
Reasons for not registering for the Certificate Track	Could not afford the fee	14
	Did not have time to complete the assigned tasks	17
	Found the assigned tasks too difficult to complete	1
	Information about Certificate Track was not clearly conveyed	2
	Not interested in obtaining a certificate	13
	Reason not cited	2
	I have registered for Certificate Track	9
Prior experience for online courses	Yes	25
	No	28
Computer at home	Yes	46
	No	7
Internet at home	Yes	46
	No	7
Computer at work/study place	Yes	48
	No	5
Internet at work/study place	Yes	3
	No	50
Inconsistent electric supply	Yes	22
	No	31
Certain educational websites blocked	Yes	11
	No	42
Difficulty in using computer	Yes	0
	No	53
Difficulty in using internet	Yes	3
	No	50

Color Key for Figures 1-3

Strongly agree Agree Disagree Strongly disagree

FIGURE 1

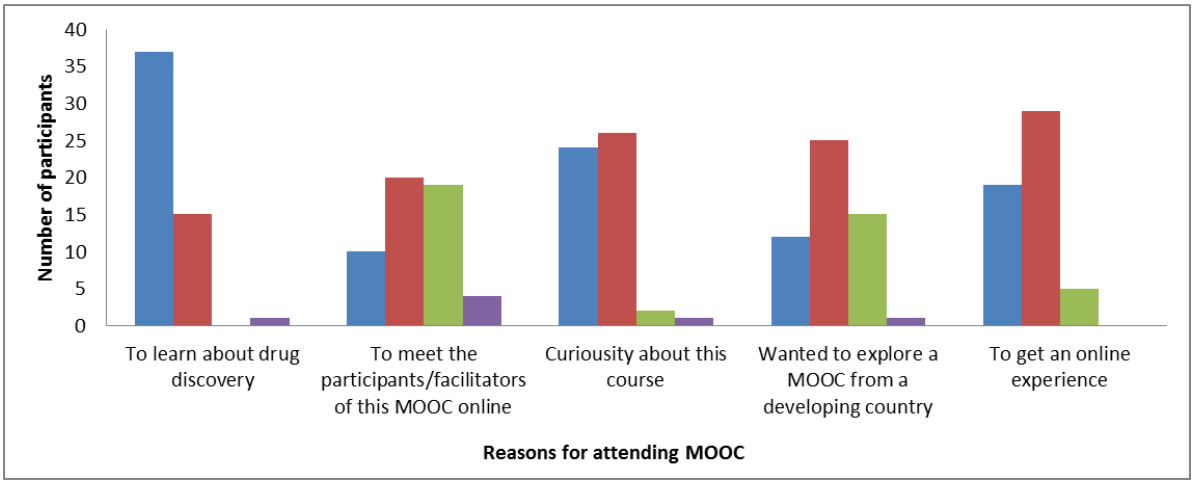


FIGURE 2

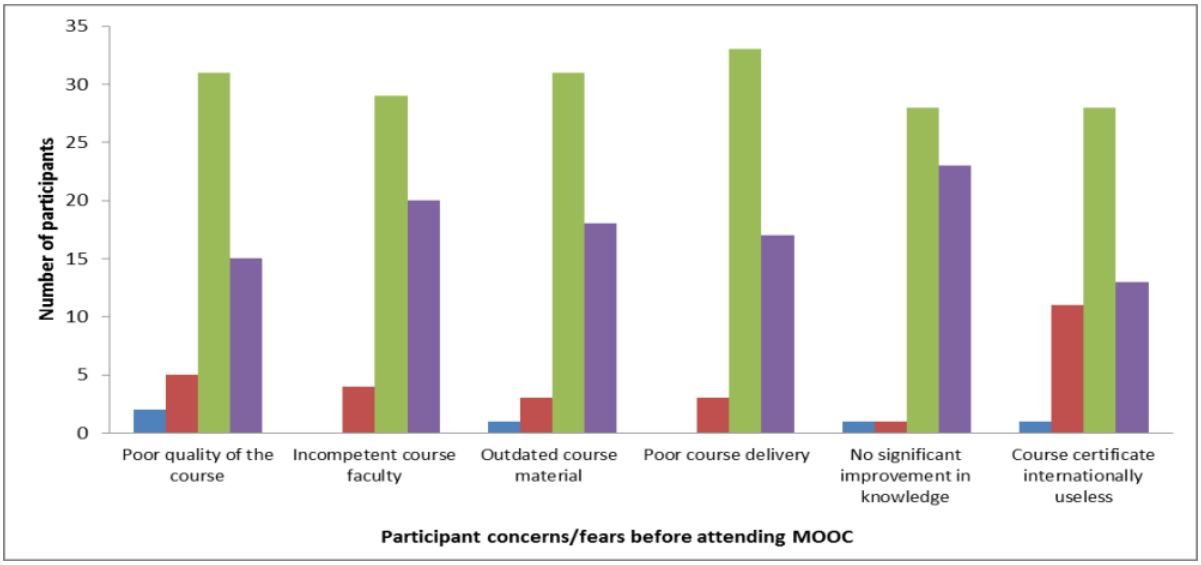
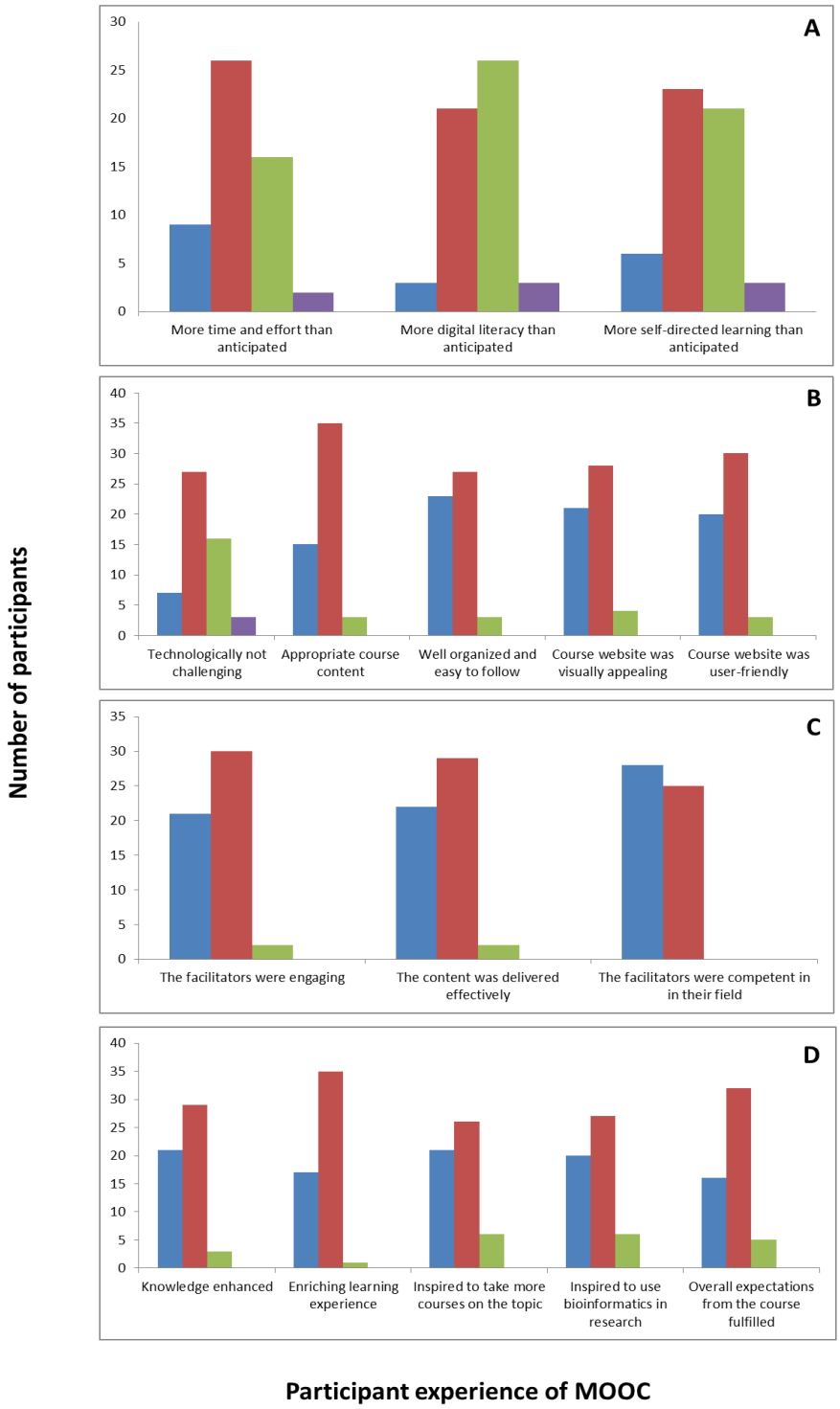


FIGURE 3


A
More time and effort than anticipated
More digital literacy than anticipated
More self-directed learning than anticipated
B
Technologically not challenging
Appropriate course content
Well organized and easy to follow
Course website was visually appealing
Course website was user-friendly
C
The facilitators were engaging
The content was delivered effectively
The facilitators were competent in in their field
D
Knowledge enhanced
Enriching learning experience
Inspired to take more courses on the topic
Inspired to use bioinformatics in research
Overall expectations from the course fulfilled
Number of participants
Participant experience of MOOC

AUTHOR BIOS

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