Developing an Intervention to Advance Learning At Scale

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ABSTRACT
With the rise of technology advancements we witness every day in our contemporary life in general, and in the education field in specific, new ways of learning are emerging, such as Massive Open Online Courses (MOOCs). MOOCs have grown rapidly for the past few years, yet meeting the needs of massive and diverse learners and keeping them motivated to learn is still a challenge. To address this concern, we have developed an intervention to meet students' learning needs and keep them motivated to learn according to their capabilities. In this paper, we will discuss the intervention and report on the preliminary results drawing on the quantitative and qualitative data of the course survey to interpret learners' experiences using this approach.

Author Keywords
MOOCs; Learning at Scale; e-Learning Ecologies, Participation.

INTRODUCTION
The phenomenon of Massively Open Online Courses, commonly known as MOOCs, is a recent innovation and one of the fastest growing trends in higher education. MOOCs aim to deliver courses from prestigious universities, typically free of charge, to any participant who has access to technology devices, technical skills and high broadband connections. These courses attract millions of learners all over the world to expand their learning and seek new knowledge. Despite their popularity and expansion, evidence suggests that only a small number of these learners go on to complete their courses successfully [1]–[3]. The issue of low completion rates has been an alarming concern in popular media and literature since the early years of MOOCs till recent times [1], [4]. In fact, the problem is not the incompletion rate per se, it is lacking the flexibility and appropriate course structure to guide students into different levels of participation to suit their needs.

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MOOCs are distinct with the openness feature which allows diverse learners to enroll in the course without admission constraints and at no cost. Research studies have shown that diverse students have different interests and intentions towards their enrollment in MOOCs [5]. As a result of this variation, students might be addressing different aspects of the course and skipping others according to their needs, interests and time availability. We believe that dropping certain activities does not mean failing the course. It means participating in the course in different ways. Therefore, we have developed a new intervention in the e-Learning Ecology MOOC to allow learners to participate in the course in three different ways, Advanced, Intermediate, and Overview level. We will discuss below the intervention in more details and investigate learners' opinions of adapting this approach. This is a work-in-progress research. Ultimately, results will help educators to rethink the MOOC design to be more flexible and suitable to the varied levels of participation that learners need. It can also help MOOCs designers to develop adaptive course features into Coursera platform to customize and personalize learning at scale.

A CASE STUDY: E-LEARNING ECOLOGIES
e-learning ecologies was the first MOOC to be offered by the College of Education at Urbana-Champaign in 2014. The course aimed to keep learners up-to-date with a range of new technologies for learning and teaching. It explored the notion of "e-learning ecologies" by analyzing the dynamics of student and teacher interactions in e-learning environments. It also investigated the ways in which technologies can create openings for new pedagogical practices, which is consistent with the theories and pedagogies discussed in the e-learning ecologies book [6].

This course was designed in a unique way to include three levels of participation: "Advanced," "Intermediate" and "Overview." As learners sign in for the course and go over the syllabus, they can select one of these options to engage in the course depending on their needs and time availability. Table 1 describes the weekly activities expected for each level of participation for this course. To illustrate, the advanced level requires watching all the videos and doing all the required assignments. It has an estimate work time of 8 to 10 hours per week. The intermediate level requires less time commitment, which is nearly 3 hours per week. Students in this track, are required to watch less videos and do less activities than those in the advanced track. For instance, they are required to watch the videos that are marked with the letter (I) and the letter (O). As for the

assignment, they should add one post and one comment per week. In the overview level, students do the minimum work with the least time. They just need to watch the overview videos. which marked with the letter (O) and at least add one comment in the forums.

	Participation Level	Time Estimate	Tasks
O	e-Learning Ecologies Overview (O)	1 hour per week	• Watch the videos and view the material marked (O) • Comment on each week's post, made by the course admin
I	e-Learning Ecologies Intermediate (I)	3 hours per week	• Watch the videos and view the material marked (O) and (I) • Comment on each week's post, made by the course admin • Make a post of your own
A	e-Learning Ecologies Advanced (A)	8–10 hours per week	• Watch the videos and view the material marked (O), (I), and (A) • Comment on each week's post, made by the course admin • Make a post of your own • Create a Case Study; peer review 3 others' Case Studies; revise your Case Study for web publication • If you are working in Scholar, you can choose to make your personal profile page and published Case Study public and permanently visible on the web.

Table 1. Three levels of participation in e-Learning Ecologies MOOC.

DATA ANALYSIS:

Towards the end of the course, learners were given a survey to ask about their learning experiences and how they participated in the course using these three assigned levels of participation. Quantitative and qualitative data analysis shows impressive results of using multiple paths of learning in MOOCs to meet students' needs as follows.

QUANTITATIVE ANALYSIS:

One of the survey questions asks: Which level of participation did you take in this course? A total of 144 learners responded to this question out of 7,504. Although this is relatively small number, but this is expected in the MOOC context for the post-course survey [7]. Interestingly, data analysis shows that learners used these levels to guide their learning path and continue participating in the course according to their needs (see table 2 and figure 1). As seen in table 2, half of the survey respondents chose to take the overview track while they learn in this course. On the other hand, 29.9% of the survey respondents indicated that they took the advanced route, whereas 20.2% of these respondents were in the intermediate track. This indicates that using this teaching strategy is helpful to foster engagement and improve participation at massive scale learning environments.

Level of Participation	Number of respondents	Percentage
Advanced	43	29.9%
Intermediate	29	20.2 %
Overview	72	50%

Table 2. Learners' responses to the three different levels of Participation.

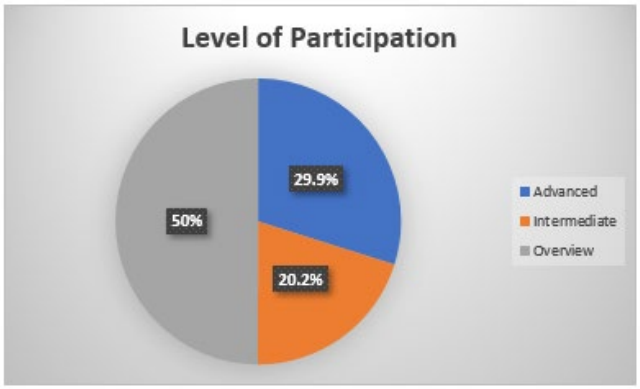

Figure 1. Visualizing of learners' levels of participation.

In another survey question, students were asked: to what extent did this course provide you with the options you need to learn the way that best suits you? A total of 160 students responded to this survey and almost half of them indicated their stratification that the course met their needs to a great extent (see table 3 and figure 2). Precisely, 37.5% of them agreed that the course met their needs to a moderate extent. Only 15.6% of them indicated that the course met their needs to a small extent. These results clearly show that learners in MOOCs have different learning goals and needs that need to be addressed when structuring and designing the learning content. e-Learning Ecology MOOC was helpful in providing learners with the different learning options they need to be successful in the course.

Q2. To what extent did this course provide you with the options you need to learn the way that best suits you?

Choices	Number of respondents	Percentages
To a small extent	25	15.6%
To a moderate extent	60	37.5%
To a great extent	75	46.9%
Total	160	

Table 3. . Learners' satisfaction of the course design.

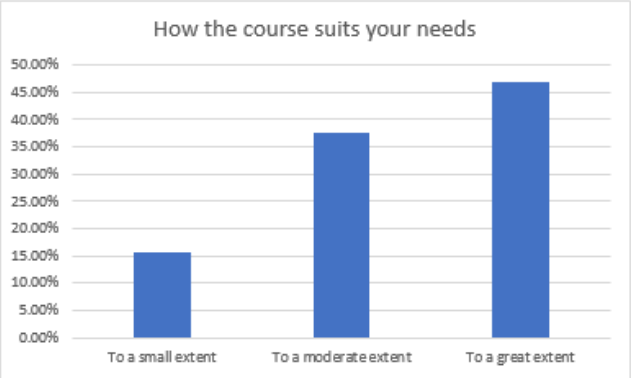

Figure 1. Visualizing of learners' opinion in how the course meets their needs.

QUALITATIVE ANALYSIS

Students also have shown great comments in the open ended questions in relation to the design of course of having three options to participate and succeed in the course. One of the students said: "The three commitment levels is a good idea and should be available in more courses … I am a visual learner and enjoyed the interactive video, with questions. The process was of a good flow for my style." Another one added: "This nature of courses allows learning to various types of learners. It suited me pretty much well. That is what I like with MOOCs there are no driven ways to learn." A third one responded: "The course design was well suited for me. The pace was good so I could keep up with the learning process." A fourth student said: "I took this course as overview of learning ecologies. I think I had a good learning experience and the course gave me a better perspective of the future of learning. I can apply to that." Another added: "I was pretty happy for being capable of keep on the overview level."

CONCLUSION

Rather than arguing the dropout rates in massive scale courses, we should move beyond that and offer new designs for such learning environments. Learning at scale requires adaptation and flexibility to keep learners motivated in the course according to their needs and their intended learning goals. This study shows positive outcome of adapting a new intervention to advance learning at scale by providing multiple paths of learning to accommodate learners' choices. With these preliminary results, we aim to further analyze the data logs of all learners in this course as to better evaluate the usefulness of this intervention. We also aim to integrate this feature in other MOOC courses and examine its uselessness. The overall results of this study is very significant to personalize and adapt learning at scale to accommodate learners' different needs.

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