

PERSONAL EXPERIENCES AND SUGGESTIONS FOR CREATING HIGHLY ATTRACTIVE MOOCs ABOUT ARTIFICIAL INTELLIGENCE

Xing Zhou, Xin Xu, Qiang Fang, Haibin Xie, Xinglong Zhang, & Yujun Zeng
College of Intelligence Science and Technology, National University of Defense Technology (China)

Abstract

MOOCs have brought many possibilities for both learners and teachers. For learners, they can study from distances and search for courses that fit their professions. For teachers, a MOOC can fully demonstrate his/her research basis, personal charisma and versatile abilities. MOOCs also bring teachers new challenges that may be overlooked in traditional education processes, especially when they are creating highly attractive, high-quality courses.

In this paper, we first introduce the information about our courses that each has been attracting more than 10,000 learners at a rapid speed. Then, we recall our personal experiences of creating them. Personal experiences include surveying and implementing: we survey the related attraction/quality research in the MOOC education literature to stand us high in the beginning. The implementing experience is in chronological order, consisting of the planning-and-preparation, presentation, uploading and post-course interaction stages. And then, we summarize our suggestions for successful MOOCs, concretely: the comprehensive preparation, including content selection and learner estimation, is important; the teamwork is crucial to make decisions more reasonable and to progress faster; the third is the presentation of the courses and then the first-eye attraction tricks; the post-course interactions and course updates are also important, which are factors of a persistent course attraction; the last but not least is the MOOC and education research--- A good pedagogy understanding enables a teacher to outstand wherever in MOOC or traditional classroom.

Keywords: *MOOC, attractive, experience, suggestion, teamwork.*

1. Introduction

Nowadays, science and technology have developed rapidly and have profoundly changed our society. For example, the artificial intelligence (AI) wave this time since its beginning in 2012, has presented many new technologies such as deep learning (Krizhevsky, Sutskever, & Hinton, 2012), reinforcement learning (Mnih, Kavukcuoglu, Silver, & et al., 2015), multi-agent learning (Hernandez-Leal, Kartal, & Taylor, 2019), and changed the military and civil affairs. Interested in the development and required by their professional need, many youngsters of China's workforce are eager to learn the recent developments and the applications. However, they rarely have the opportunity to re-enter the schools to learn since they have graduated from campus for a long time. Therefore, e-learning can be very helpful to meet their demand and improve their knowledge, which will both be beneficial to their individuals and to the professions they take.

As a type of e-learning, massive open online courses (MOOCs) have deeply changed the traditional education forms and brought many possibilities as a new form. Since its beginning (Pappano, 2012), it can give people from thousands of miles away a chance to learn high-quality, attractive and useful courses that are provided by high-level organizations and charming teachers with a very cheap cost.

MOOCs also pose new inspirations and challenges for traditional teachers. Many teachers in universities do state-of-the-art research and teach courses that incorporate the newest developments. These teachers would applaud to broadcast their insights and new findings, make their research and teaching applied to verify the performance in real world and gain benefits from the applications. MOOCs can satisfy their longings--- MOOCs can fully demonstrate teachers' insights into the new science and technology on courses, a broad understanding of the new developments, teachers' personal charisma, and versatile abilities in conveying knowledge. Nevertheless, the largest new challenge is the lack of

face-to-face interaction between the teachers and the learners, which will mislead the teacher's judgment. Therefore, MOOC teachers should do pre-work for creating highly attractive MOOCs.

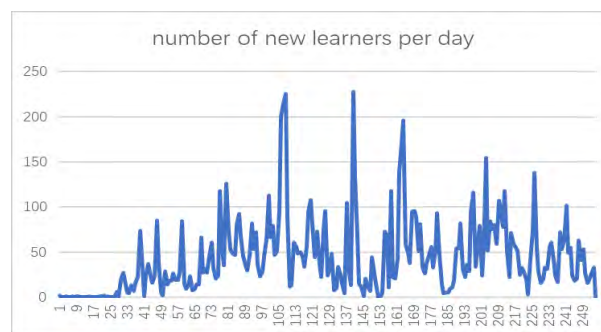
Aiming to help youngsters in China and to gain our academic impacts, our team has planned and implemented two MOOCs about artificial intelligence. Each course in about 200 days has attracted over 10,000 people from the specific community since course uploading. The basic information of the two course is in Table 1.

Table 1. The basic information of the two MOOCs.

	Course 1	Course 2
Name	Domain-specific artificial intelligence and unmanned system	artificial intelligence: concepts, perspectives and challenges
Difficulty	medium	elementary
Length	6 lessons, average 20 min long	11 lessons, average 20 min long
Uploading date	2021.08.13	2021.06.02
Studied learners	11235	12823
Team member number	4	3
Team composition	age>45, 1; age<35, 3	age>45, 1; age<40, 2

Figure 1 depicts the number of new learners every day since the uploading. The course was uploaded into one specific MOOC platform in China where there exist over three thousand courses. Among them, our course outstands with high attraction, ranking top 100. Hereafter, we mainly use Course 1 as illustrations.

Figure 1. The running data of Course 1.



2. Literature review

Before making our course, we searched the scholarly literature to survey and better understand how to create highly attractive MOOCs, as we are completely newcomers of creating MOOCs. We tried to stand ourselves on the shoulders of previous people. We aim at two types of work: the attraction measure (including techniques used) and findings of previous highly attractive MOOCs.

The literature has revealed many investigations on high attraction, high-quality MOOC production. Work (Hood & Littlejohn, 2016) summarizes the need for measuring MOOC quality and gives much importance to presage, process and product, which inspire us to spend much time on the process. For the evaluation of MOOC success can be net promoter score (Palmer, & Devers, 2018). There are some techniques to improve the MOOC, for example, dropout prediction (Dalipi, Imran, & Kastrati, 2018), using machine learning with recurrent neural networks and decision trees and many other AI technologies are used to develop MOOC. (Xie, 2019b) used basic technologies from information science to analyze the log data of viewing behavior provided by the MOOC. And it uses network to represent the learning path and sheds light on the application of network navigation and link prediction to the MOOC education to make effective education MOOC. One paper (Xie, 2019a) assesses MOOC attraction with scientometrics adapted from academies such as impact factor and h-index to assess course attraction. It also analyzed the limitation of the provided indicators and shed potential practionability.

Work (Najafi, Rolheiser, & et al, 2015) surveyed eight instructors to understand their motivation, MOOC instruction suggestions, and perceptions of MOOCs' implications. It summarizes common motivations. The work from University of Hong Kong (Doherty, Harbutt, & Sharma, 2015) has given

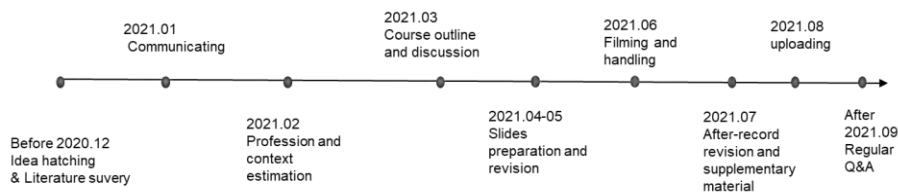
complimentary tips for high quality, that are: informed choice, plan for success, reduce risk, bring in experts, etc. Another work (Lowenthal, Snelson, & Perkins, 2018) reported findings from about 200 teachers in the front line of MOOC. The findings indicate that instructors were motivated to teach MOOCs for interest and passion, publicity and marketing, benefits and incentives. Contexts counts (Hood, Littlejohn, & Milligan, 2015): The learners contexts influence learning in a MOOC. Significant differences were identified between learners with and without similar real-world contexts to their MOOC learning. So connected learning in a MOOC to real-world contexts makes learning more accessible. In (Kruchinin, 2019), the researcher categorizes the courses into several parts and found no difference in popular in each university type with a top university or other platform, however, the number of students who really completed the course was much higher for the MOOCs created by top universities complete rate enrollment and accomplishment. The effective teaching is also important (Wong, 2016). It summarized the factors leading to the effective teaching: The first impression, detailed introduction trailer, etc.

We learned in literature that the contexts of learners are vital and teachers should devote much time before, during and after the MOOC. Teachers can also do pedagogy and education technology research to gain the attraction of MOOCs.

3. Experience process

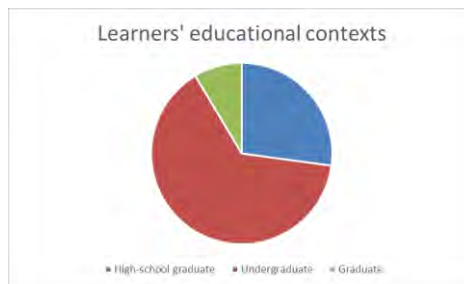
In view of the demand for AI knowledge and applications, and our inner motivation, we propose building such AI MOOCs. As newcomers of MOOC production, we first did deep planning and surveying. After surveying, we comprehensively prepared the course for several months, and the experience process is shown in Figure 2:

Figure 2. The experience process of Course 1



We proposed our MOOC **plan** in December 2020 to our institution, and received full support. We then **communicated** with different people, including MOOC experts, librarians, video studio workers, in January 2021. With the survey and communication, we learned that learner's **professions and contexts** are very important for a MOOC. So, we turned to our colleagues for their MOOC statistics and statistically estimated the portion of professions and the contexts. For the context, we envisaged most are high-school undergraduates and then undergraduates. For their professions, we thought some are technology institution administrators, some are AI users, and some are interesters. Their aims are to gain their knowledge about recent developments and potential applications. Therefore, our course content should align with the conditions of these learners. The final contextual data log from our MOOC course is shown in Figure 3. It can be seen that the estimation fits the reality well.

Figure 3. The contexts of learners of Course 1.



After the deep survey and the estimation of the learners, we make an **outline** of the course and discuss it several times within our team. After discussion, we began to **make slides**. The slides are from courses that we recently taught with in our physical classes. Slides are interesting and self-illustrating,

easy to understand and natural. The slides were also discussed and revised in several rounds. After that, the teachers are enthusiastically **filming** the video. After the filming, the video was added subtitles and iterated several rounds to make the quality as high as possible. At the same time, preparing the other **affiliated materials**, such as cover video (eye-attraction video). The cover video is short, but astonishing. Also prepares the quizzes, exams and some other supplementary materials for further reading. Table 2 shows the information of our affiliated questions.

Table 2. The test question of the MOOC.

test question types	total number(total score)	quiz(quiz score)	exam(exam score)
Sum of quiz and exam	77 /154	26/52	51/102
T/F questions	38/76	14/28	24/48
single-choice	8/16	5/10	3/6
blank-filling	3/6	2/4	1/2
multiple-choice	28/56	5/10	23/46

However, the above stages are not all. Teachers also regularly checked and navigated the course forums to answer learners' questions and to discuss deeply into the questions. Teachers should also reupload to improve the videos. Only by these can keep the MOOC persistently attractive. Below is the word frequency of our course forum. Learners cared much about research, application, approaches and books&articles.

Table 3. The word frequency in the course forum.

research	application	approach	publishing	UAV	system	learning	AI	article	based
17	16	15	13	11	10	10	9	8	8

4. Suggestions

Our suggestions for creating high-quality, highly attractive courses are that:

Comprehensive preparation. It includes the content preparation and requirement engineering. The content should have the possibility to help people at different levels to improve their knowledge. In the content, one should add positive energy to it slightly and implicitly. The content should have a good logical order and is tightly related to the professions of the learners, while teachers should be familiar with this field and have deep insight into this field. This stage needs much time, but "sharpening your axe will not delay your job of chopping wood". During the preparation, spend much time to consider the current trends, and the contexts of learners. After preparing the content, including the subtitles into the videos, and the supplementary reading materials. Discuss it several times and listen for the suggestions from different interest of partners, colleagues and institutional administrators and students, etc.

Teamwork, teamwork and teamwork. The more teamwork devoted, the better quality of your MOOC. The team members can have different missions, some can prepare the content, someone presents the content. Moreover, someone do the forestage and backstage preparations. Also, teamwork can find out implicit errors that otherwise would be hard to find because one person would always think a similar way. Extensive teamwork will make content average people acceptable. They would work out a way to convey the knowledge easy to accept by most people.

Detailed and attractive information page. Pay attention to the first impression and attraction tricks. The first impression determines what goes next. So, the cover video can be made fascinating and attracting. Several seconds video would be attractive and convincing. It also reveals the main content in several seconds: What the course would like, the chapters and the section title, the teacher's information, the basic knowledge that learners should have, etc.

High-quality presentation. The teachers should be confident with the content. The video quality should be high, and duration for each video should not be long, because people's concentration would not last long. Terminology would not be hard to understand, which will make them tired instead of relaxed. The slides should be beautiful and should not be too crowded nor too simply. The teacher also should be enthusiastic and with a freeze smile. Accents should be avoided. Speed should be medium with the standard gestures not awkward. Hand gestures should represent the emotion of the teacher's inner thoughts. Representation also can combine with some tools and several cameras. The person can disappear for a long-short time.

Post-course interactions and updates. They are critical for a persistent long time cause attraction. It is not in one-time bargain. One should track the statistics regularly to improve the MOOCs and fix some errors. The discussion/forum section leaves some questions mostly from the learners. It can help to understand where the learners have difficulties. So, it would help if the teacher answered typical questions in detail and directly related to the questions into the video content. The answer could be within a short time. If for a long time, students would have learned the whole content and left away. The interaction also brings what in the following part from the discussion, then this will make your next version of MOOC More attractive.

The last but not least is the **pedagogy research** for education. A good pedagogy has leveraged the teacher high on other people's shoulders. Moreover, it can help avoid traps, which will make progress fast and good.

5. Conclusions

In this paper, we showed our experience of creating highly attractive MOOCs and summarized personal suggestions for future creators. Our experience and suggestions may not be that generalizable for all teachers because of different spatio-temporal conditions. Nevertheless, we think some suggestions are persuasive and can be followed and referenced. In the future, we would like to apply these suggestions to create MOOCs about other fields and to promote knowledge across the world fast and broadly.

References

- Doherty, I., Harbutt, D., & Sharma, N. (2015). Designing and developing a mooc. *Medical Science Educator*, 25(2), 177–181.
- Hernandez-Leal, P., Kartal, B., & Taylor, M. E. (2019). A survey and critique of multiagent deep reinforcement learning. *Autonomous Agents and Multi-Agent Systems*, 33(6), 750–797.
- Hood, N., & Littlejohn, A. (2016). Mooc quality: the need for new measures. *Journal of Learning for Development*, 3(3), 28–42.
- Hood, N., Littlejohn, A., & Milligan, C. (2015). Context counts: How learners' contexts influence learning in a mooc. *Computers & Education*, 91, 83–91.
- Krizhevsky, A., Sutskever, I., & Hinton, G. E. (2012). Imagenet classification with deep convolutional neural networks. *Advances in neural information processing systems*, 25, 1097–1105.
- Kruchinin, S. (2019). An investigation into the attraction and completion rates of moocs. *Knowledge Management & E-Learning: An International Journal*, 11(1), 38–58.
- Lowenthal, P., Snelson, C., & Perkins, R. (2018). Teaching massive, open, online, courses (moocs): Tales from the front line. *International Review of Research in Open and Distributed Learning*, 19(3), 1-19.
- Mnih, V., Kavukcuoglu, K., Silver, D., Rusu, A. A., et al(2015). Human-level control through deep reinforcement learning. *Nature*, 518(7540), 529-533.
- Najafi, H., Rolheiser, C., Harrison, L., & Haklev, S. (2015). University of toronto instructors' experiences with developing moocs. *International Review of Research in Open and Distributed Learning*, 16(3), 233–255.
- Palmer, K., & Devers, C. (2018). An evaluation of mooc success: Net promoter scores. In *Edmedia+ innovate learning* (pp. 1648–1653).
- Pappano, L. (2012). The year of the mooc. *The New York Times*, 2(12), 2012.
- Wong, B. T.-m. (2016). Factors leading to effective teaching of moocs. *Asian Association of Open Universities Journal*, 11(1), 105-118.
- Xie, Z. (2019a). Assessing the attractions of moocs from the perspective of scientometrics. *IEEE Access*, 7, 136409-136418.
- Xie, Z. (2019b). Bridging mooc education and information sciences: Empirical studies. *IEEE Access*, 7, 74206–74216.