

# To change or not to change? That's the question...

Citation for published version (APA):

Henderikx, M., Kreijns, K., & Kalz, M. (2017). To change or not to change? That's the question... On MOOC-success, Barriers and their Implications. In C. Delgado Kloos, P. Jermann, M. Pérez-Sanagustín, D. T. Seaton, & S. White (Eds.), *Digital education: Out to the world and back to the campus: 5th European MOOCs Stakeholders Summit, EMOOCs 2017, Madrid, Spain, May 22-26, 2017 Proceedings* (pp. 210-216). Springer. [https://doi.org/10.1007/978-3-319-59044-8\\_25](https://doi.org/10.1007/978-3-319-59044-8_25)

**DOI:**

[10.1007/978-3-319-59044-8\\_25](https://doi.org/10.1007/978-3-319-59044-8_25)

**Document status and date:**

Published: 01/05/2017

**Document Version:**

Peer reviewed version

**Please check the document version of this publication:**

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

<https://www.ou.nl/taverne-agreement>

**Take down policy**

If you believe that this document breaches copyright please contact us at:

[pure-support@ou.nl](mailto:pure-support@ou.nl)

providing details and we will investigate your claim.

Downloaded from <https://research.ou.nl/> on date: 21 Sep. 2023

**Open Universiteit**  
[www.ou.nl](http://www.ou.nl)



# To Change or not to Change? That's the Question... On MOOC-Success, Barriers and their Implications

Maartje Henderikx<sup>1</sup>, Karel Kreijns<sup>1</sup>, Marco Kalz<sup>2</sup>

<sup>1</sup>Open University of the Netherlands, Welten Institute, Heerlen, The Netherlands

<sup>2</sup>Open University of the Netherlands, UNESCO Chair of Open Education, Faculty Management, Science and Technology and Welten Institute, Heerlen, The Netherlands  
{maartje.henderikx, karel.kreijns, marco.kalz}@ou.nl

**Abstract.** This explorative study aimed to get an understanding of MOOC-success as seen from the perspective of the MOOC-taker and the types of barriers which might stand in the way of this success. Data of two MOOCs was used to illustrate MOOC-success from two perspectives and barriers encountered. Following the currently used approach to identify educational success, the success rate of MOOC-II was 5,6%. The success rates from the perspective of the MOOC-taker was 70%. In addition, data of MOOC-I and II showed that the encountered barriers were mainly non-MOOC-related. Workplace issues and lack of time were most frequently indicated. For MOOC-designers' decision making regarding redesign of a MOOC after evaluation, it is valuable to have insight in these matters to prevent unnecessary design interventions.

**Keywords:** MOOCs, online learning, success, intention, behaviour, barriers

## 1 Introduction

When people start a MOOC their intentions are very diverse; some of them want to complete the MOOC and earn a certificate, others just want to freshen up on some specific knowledge or only browse to see what it is all about [1]. For this reason, it does not suffice to only look at the number of certificates earned by the MOOC-takers for determining success, even though this method is often transferred from the formal education context to the MOOC and is the most widely-used method of identifying educational success. As an alternative approach, we take the initial intention of the individual as a starting point for measuring success taking into account that MOOCs allow individuals to follow their own learning paths [2]. These intentions may vary from simply browsing through a MOOC to—indeed—getting a certificate. Studies on behavioural and cognitive psychology, however, showed that in general intention is not a perfect predictor for actual behaviour as there are many factors that can influence the process of acting out intentions [3]. Therefore, insight into the issues which hinder or prevent individuals from translating their intentions into actual behaviour is of great value when it comes to deciding whether course (re)design interventions are necessary. This paper is structured as follows: First we discuss the theoretical background. Next data from three MOOCs is analysed in line with the theoretical framework. Lastly, results of these analyses are discussed as well as implications for future research and limitations.

## 2 Theoretical Framework

The reasoned action approach (RAA) [3] serves as a theoretical framework to our study, as it pays attention to the intention-behaviour gap. The framework is centred around the formation of an intention and the translation of this specific intention to actual behaviour. Sheeran [4] described four different intention-behaviour patterns that can be distinguished: 1) *Inclined actors*; individuals who formed a certain intention and did act according to those intentions, 2) *Inclined abstainers*; individuals who formed a certain intention but fail to act according to this intention, 3) *Disinclined actors*; individuals who formed a certain intention but end up doing more than they intended to do and finally, 4) *Disinclined abstainers*; individuals who do not have any intentions and accordingly do not act. This latter group shall not be included in the context of MOOCs, for the reason that this group will never start a MOOC in the first place.

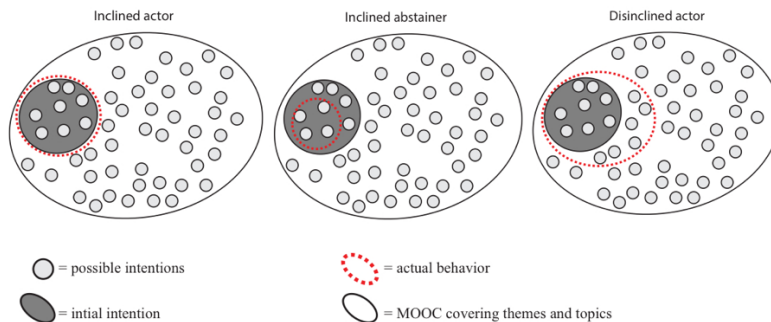


Fig. 1. Intention-behaviour patterns

Figure 1 visually illustrates the three possible intention-behaviour patterns in a MOOC. As can be seen, many individual intentions are possible which may vary from only finishing the first three modules to completing the full course and getting the certificate. Following the intention-behaviour patterns, MOOC-takers who formed the intention to finish the first three modules of a MOOC and actually succeed in doing so, are identified as inclined actors and are considered successful MOOC-takers. MOOC-takers who only planned to browse through the course or download some interesting materials and who eventually finish three modules are also considered as successful.

However, an intention which is formed at the start of a MOOC does not always equal the actual behaviour [3]. This gap between intention and behaviour can be caused by barriers; these barriers can be either MOOC-related (i.e. lack of interaction) or non MOOC-related (i.e. workplace issues) and may cause MOOC-takers to change their individual intention or even stop. An explorative, non-exhaustive, literature review on barriers encountered by students in MOOCs and online learning in general showed that lack of interaction [5,6,7], lack of time [8,9,10] and insufficient academic background [8, 10] are barriers students frequently encounter. Other barriers experienced by students were: family issues and lack of support family and friends [10], workplace commitments and lack of support from the workplace [10] and insufficient technology background [9]. Only a sub-set of these barriers can be addressed by redesign of the MOOC.

Thus, insufficient insight into the reasons behind success and failure rates in MOOCs could lead to negative evaluations and unnecessary interventions. To address this problem, the following two research questions will be addressed in this study:

1. What are implications of an intention-centric success measurement in MOOCs compared to a certificate-oriented success measurement?
2. What type of barriers do MOOC-takers encounter during the runtime of a MOOC?

### 3 Method

#### 3.1 Participants

Participants were MOOC-takers of two MOOCs. The first MOOC (MOOC-I) was a Spanish MOOC about Business Intelligence and Big Data and was offered from February until April 2016, covering five modules for five weeks. The pre-questionnaire was unfortunately not distributed due technical problems with the platform but the post-questionnaire was completed by 143 MOOC-takers (37 women, 106 men,  $M_{age} = 41,6$ , age range: 25-64 years).

The second MOOC (MOOC-II) was a Dutch MOOC about The Adolescent Brain and ran from April until June 2016 in Dutch, covering seven modules for seven weeks. The pre-questionnaire was completed by 821 MOOC-takers (664 women, 157 men,  $M_{age} = 45,1$ , age range: 18-74 years). The post-questionnaire was completed by 126 MOOC-takers (unfortunately participant information was not available). In total 101 MOOC-takers completed both questionnaires (90 women, 11 men,  $M_{age} = 37$ , age range: 18-54 years).

#### 3.2 Materials

To measure the intention of the individual MOOC-takers a self-constructed set of items was used aligned with the design of the respective MOOCs. Items covered increasing intentions from browsing, partial participation in one or more modules, up to participating in all learning activities and receiving a certificate. These items were included in the pre- and post-questionnaire of MOOC-II. In the post-questionnaire MOOC-takers were asked to indicate their actual behaviour on the same set of items as was used in the pre-questionnaire.

The post-questionnaire of MOOC-I and II included several questions on specific barriers MOOC-takers encountered. These barriers were derived from an explorative, non-exhaustive, literature review on barriers in MOOCs and online learning in general, including articles from 2008 until present. Figure 2 displays these barriers categorized into MOOC-related and MOOC. MOOC-takers could indicate multiple barriers.

MOOC-related		Non-MOOC related	
<i>Design</i>	Lack of support	<i>General</i>	Lack of information literacy
Problems with the site	Content was not appropriate	Workplace issues	Insufficient academic background
Lack of interaction	<i>Expectations management</i>	Lack of time	Lack of motivation
Lack of instant feedback	Course was too easy	Family issues	Lack of personal commitment
Lack of instructor presence	Course did not meet expectations	Lack of workplace support	<i>Technical</i>
Lack of useful feedback	Course was too difficult	Lack of family support	Technological problems pc
		<i>Personal</i>	Bad internet connection
		Lack of technological skills	

Fig. 2. Overview barriers arranged by type

### 3.3 Procedure

In the first week of MOOC-II, all the registered MOOC-takers received an invitation to participate in the pre-questionnaire. Due to technical difficulties, MOOC-takers of MOOC-I did not receive an invitation for the pre-questionnaire and therefore were not able to complete the pre-questionnaire. At the end of the last week of both MOOCs all the registered MOOC-takers received an invitation to participate in the post-questionnaire.

## 4 Results

### 4.1 Intention-oriented vs certificate-oriented success measurement

Part one of this analysis focused on success measurement from the MOOC-taker perspective. We mapped the intention-behaviour on an individual level which follows the theory as discussed in the theoretical framework. In MOOC-II, 101 participants completed both the pre-questionnaire and the post-questionnaire.

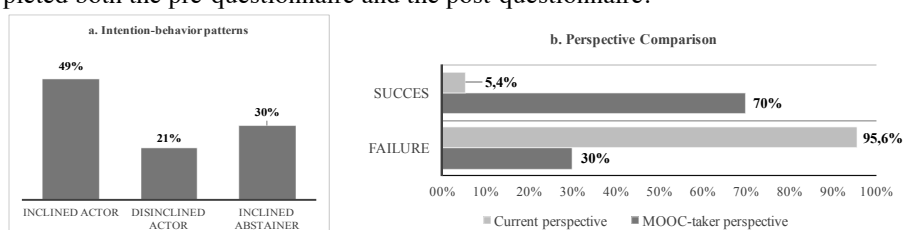


Fig. 3a+b. Intention-behaviour patterns MOOC-II (a) and perspective comparison MOOC-II (b)

In this MOOC, 49% of the MOOC-takers who completed both the pre-questionnaire and the post-questionnaire, can be regarded as inclined actors, 21% as disinclined actors, and 30% of the MOOC-takers as inclined abstainers (Fig 3a).

Part two of the analysis focussed on comparing the intention-oriented with the certificate-oriented measurement of success. The certificate-oriented rates were calculated by taking the number of certificates earned by the MOOC-takers divided by the total number of registered MOOC-takers (Fig. 3b). MOOC-II had 1763 registered MOOC-takers, of whom 98 earned a certificate, which results in a success rate of 5,4%<sup>1</sup>. The intention-oriented rates result in a success rate of 70% and a failure rate of 30%.

### 4.3 Barriers

The question which type of barriers were encountered during the runtime of MOOCs I and II was answered by 50 MOOC-takers of MOOC-I and 76 MOOC-takers of MOOC-II who completed both questionnaires. Figure 4a shows that in MOOC-I 75% and in MOOC-II 66% of the barriers are non MOOC-related. Figure 4b displays that 25% of the indicated barriers of MOOC-I are MOOC-related and 34% of the barriers of MOOC-II. Of the non MOOC-related barriers MOOC-takers mostly indicated general barriers; 50% in MOOC-I and 55% in MOOC-II.

<sup>1</sup> Calculation:  $(422/6452) \times 100\%$

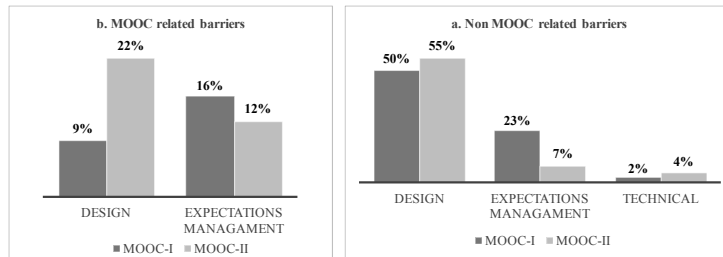


Fig. 4a+b. Overview MOOC-related (a) vs non MOOC-related barriers (b)

The most important MOOC-related barriers were related to expectation management and design.

## 5 Discussion

This explorative study aimed to get an understanding of MOOC-success as seen from the perspective of the MOOC taker and the types of barriers which might stand in the way of transferring intentions into actual behaviour. Insight in these matters is valuable for MOOC-makers as the success measurement is often used as an indicator for the necessity of design interventions [2].

Data of MOOC-II was used to compare currently used certificate-oriented success measurement with our proposed intention-oriented success measurement. The results show that there is a big difference between success rates, which are respectively 5,4% and 70%. This finding demonstrates that merely looking at course completion as a measure for MOOC and individual success might not suffice. A small change in the way we look at determining MOOC-success might have a large impact on MOOC (re)design and strategic choices of the MOOC providers.

Furthermore, three intention-behaviour patterns were determined: inclined actors, disinclined actors and inclined abstainers [4]. After matching the intention-behaviour data from the pre- and post-questionnaire of MOOC-II, most MOOC-takers (49%) were identified as inclined actors. It can be expected that these MOOC-takers are content with their achievement. However, this does not necessarily imply that they were satisfied with issues like MOOC-content, design or learning experience. Quite a substantial group of 21% of the MOOC-takers were distinguished as disinclined actors. Reasons for this could be that they might have set low targets for themselves (just browse, or do some learning activities), or the course content might have unexpectedly interested them more than they anticipated. Further research is necessary to understand the reasons behind this behaviour. A third group of 30% was identified as inclined abstainers. These participants formed certain goal intentions but were not able to transform these intentions to actual behaviour. Did this group meet the most barriers? Did they set the highest targets? Future research should open this proverbial black box.

Lastly, in the post-questionnaire of MOOC-I and II, MOOC-takers could indicate multiple barriers they encountered during the course. An analysis of whether barriers encountered by MOOC-takers were MOOC-related or non-MOOC-related showed that most of the barriers can be considered as non-MOOC-related barriers. In MOOC-I and II 75% and 66% of the barriers were not related to the course itself. These results are

important for MOOC-designers as they need to be well informed about the reasons behind success and failure rates.

This study had several limitations. First of all, the MOOC-takers who participated in the questionnaires are likely to belong to the group with higher intentions due to the survival bias that can occur in MOOCs. In addition, the samples are relatively small, especially to compare the intention-behaviour gap based on data from the pre-and-post questionnaire. Also, the way the respective MOOCs were designed might have had an impact on the type of barriers MOOC-takers encountered.

In conclusion, insight into individual intentions of MOOC-takers and types of barriers encountered by these MOOC-takers provides a richer knowledge base for MOOC-makers as it comes to deciding whether redesign is necessary. This explorative study is a first step into providing these insights and a first step towards further research into these matters to support MOOC-makers in their decision-making processes.

**Acknowledgement.** This work is financed via a grant by the Dutch National Initiative for Education Research (NRO)/The Netherlands Organisation for Scientific Research (NWO) and the Dutch Ministry of Education, Culture and Science under the grant nr. 405-15-705 (SOONER/<http://sooner.nu>).

## References

1. Koller, D., Ng, A., Do, C., Chen, Z.: Retention and intention in massive open online courses: In depth. *Educause Review*, 48(3), 62-63 (2013)
2. Henderikx, M., Kreijns, K., Kalz, M. (submitted). Refining success and dropout in MOOCs based on the intention-behavior gap
3. Fishbein, M., Ajzen, I.: Predicting and changing behavior: The reasoned action approach. Taylor & Francis, (2011)
4. Sheeran, P.: Intention—behavior relations: A conceptual and empirical review. *European review of social psychology*, 12(1), 1-36 (2002)
5. Khalil, H., Ebner, M.: Interaction Possibilities in MOOCs – How Do They Actually Happen? International Conference on Higher Education Development (pp. 1-24). Mansoura University, Egypt (2013a)
6. Levy, D., Schrire, S.: The case of a massive open online course at a college of education. Informally published manuscript, Kibbutzim College of Education, Technology and the Arts, Israel (2012), <http://conference.nmc.org/files/smkbMOOC.pdf>.
7. McAuley, A., Stewart, B., Siemens, G., Cormier, D.: Massive open online courses: Digital ways of knowing and learning. Charlottetown, PE: University of Prince Edward Island (2010)
8. Belanger, Y., Thornton, J.: Bioelectricity: A Quantitative Approach. Durham, NC (2013), [http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke\\_Bioelectricity\\_MOOC\\_Fall2012.pdf?sequence=1](http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf?sequence=1)
9. Khalil, H., Ebner, M.: MOOCs Completion Rates and Possible Methods to Improve Retention - A Literature Review. In World Conference on Educational Multimedia, Hypermedia and Telecommunications (pp. 1236–1244). Chesapeake, VA: AACE (2014)
10. Onah, D. F. O., Sinclair, J. E., Boyatt, R.: Dropout rates of massive open online courses: behavioural patterns. In 6th International conference on Education and New Learning Technologies pp. 5825–5834. Barcelona, Spain: EDULEARN14 (2014)