

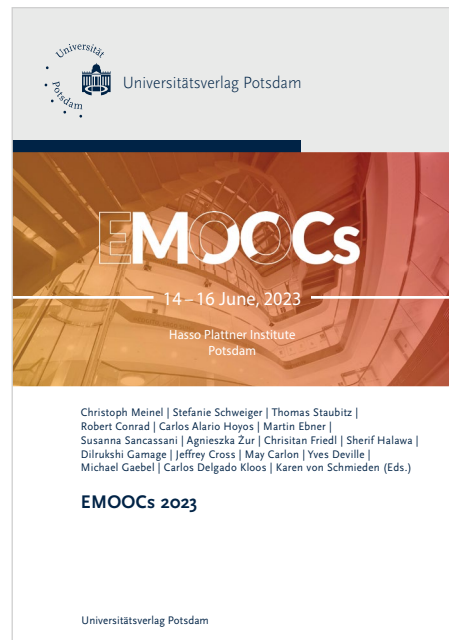
Article published in:

Christoph Meinel, Stefanie Schweiger, Thomas Staubitz, Robert Conrad, Carlos Alario Hoyos, Martin Ebner, Susanna Sancassani, Agnieszka Żur, Christian Friedl, Sherif Halawa, Dilrukshi Gamage, Jeffrey Cross, May Kristine Jonson Carlon, Yves Deville, Michael Gaebel, Carlos Delgado Kloos, Karen von Schmieden (Eds.)

EMOOCs 2023

2023 – vii, 350 p.

DOI <https://doi.org/10.25932/publishup-57645>



Suggested citation:

Martin Ebner; Sarah Edelsbrunner; Katharina Hohla-Sejkora; Bettina Mair; Sandra Schön; Silvia Lipp; Iris Steinkellner; Ivana Stojcevic; Charlotte Zwiauer: Impact assessment of a MOOC platform, In: Christoph Meinel, Stefanie Schweiger, Thomas Staubitz, Robert Conrad, Carlos Alario Hoyos, Martin Ebner, Susanna Sancassani, Agnieszka Żur, Christian Friedl, Sherif Halawa, Dilrukshi Gamage, Jeffrey Cross, May Kristine Jonson Carlon, Yves Deville, Michael Gaebel, Carlos Delgado Kloos, Karen von Schmieden (Eds.): EMOOCs 2023 : Post-Covid Prospects for Massive Open Online Courses - Boost or Backlash?, Potsdam, Universitätsverlag Potsdam, 2023, S. 171–186.
DOI <https://doi.org/10.25932/publishup-62422>

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Impact Assessment of a MOOC Platform

Considerations, Development, and Results

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In 2020, the project “iMooX – The MOOC Platform as a Service for all Austrian Universities” was launched. It is co-financed by the Austrian Ministry of Education, Science and Research. After half of the funding period, the project management wants to assess and share results and outcomes but also address (potential) additional “impacts” of the MOOC platform. Building upon work on OER impact assessment, this contribution describes in detail how the specific iMooX.at approach of impact measurement was developed. Literature review, stakeholder analysis, and problem-based interviews were the base for developing a questionnaire addressing the defined key stakeholder “MOOC creators”. The article also presents the survey results in English for the first time but focuses more on the development, strengths, and weaknesses of the selected methods. The article is seen as a contribution to the further development of impact assessment for MOOC platforms.

1 Introduction

In 2012, the University of Graz and Graz University of Technology (TU Graz) submitted a project proposal to the Province of Styria to establish a platform called iMooX, to bring together Massive Open Online Courses (MOOCs). The first MOOC, i.e. a free, openly accessible online course aimed at a huge number of people, was hosted on the platform in 2014 [10]. Since its launch, around 200 MOOCs have been implemented on the platform. They are usually available for independent, autonomous learning on the course platform for several months after a guided or supervised phase ends. For all universities that want to offer MOOCs on iMooX.at, there is also support for the conception of MOOCs or even workshops for creating OER in general. In 2020, as part of the call for proposals “Digital and Social

Transformations in Higher Education” of the Austrian Federal Ministry of Education, Science and Research (BMBWF), the project “iMooX – The MOOC Platform as a Service for all Austrian Universities” was launched, which aims to further develop the iMooX.at platform into a national MOOC platform. In this context, the Graz University of Technology and the University of Vienna are responsible for testing and adapting the technical, media-didactic, and organizational capacities accordingly and for producing MOOCs on a larger scale and offering them on the platform; at the same time, all Austrian universities will be able to implement MOOCs on the platform free of charge during the project period (2020–2023). This means that the comprehensive services of the platform – i.e. information, training of the creators, support of the MOOC participants as well as hosting the MOOCs for Austrian universities – are offered free of charge during the project. In this way, the platform also contributes to competence development in formal and informal learning. About two years after the start of the project, the project team wanted to draw a preliminary conclusion regarding the impact of the MOOC platform respectively the co-funded project.

Particularly when MOOC platforms are set up with the help of funding – which is the norm – the question arises whether the desired results and impacts have been achieved thanks to the funds invested. Obviously, the number of MOOCs and the number of participants is an indicator often used to confirm this. At the halfway point of a funding program for the Austrian MOOC platform “iMooX.at”, the options for measuring impact were explored extensively. In this paper, we would like to present the approach in a broader context and address opportunities for the impact measurement of MOOCs and MOOC platforms.

2 Approach

In this article, we will first present the possibilities and approaches of impact measurement in the context of MOOC platforms. Since the Austrian MOOC platform only offers courses with Creative Commons licenses or, in the best case, openly licensed courses, we will also look at impact research in the context of open educational resources (OER). We will then present the approach chosen for investigating the impact of iMooX.at, and a questionnaire for MOOC creators was developed.

This contribution is based on an already published research article, where the impact assessment results were presented in German [3]. With this contribution, the methodological assumptions and development will be enriched and explained in more detail for an international target group with the idea to foster the discussion on the MOOC platform impact. Therefore, we also want to reflect on the approach

and method to systematically contribute to and stimulate the discussion of impact research on MOOC platforms.

3 Impact Measurement: Ideas and concepts

3.1 Conceptual insights on impact research in the field of OER

MOOCs available as OER can be seen as digital social innovations [13]. Ebner, Orr & Schön [4] explored how an impact measurement of OER might be conducted. In general, from the perspective of a funding organization that wants to examine or evaluate the achievement of goals and the effectiveness of their funding or inputs, a distinction is generally made [7] between outcomes (outputs, results) and impact (consequences of results) that can be counted, measured, and listed [4]. Measurable indicators should be used so that their fulfillment can also be used to indicate changes. Impacts are more long-term and may include some indirect effects that are difficult to measure because the intervention contributes significantly, but not exclusively, to their achievement.

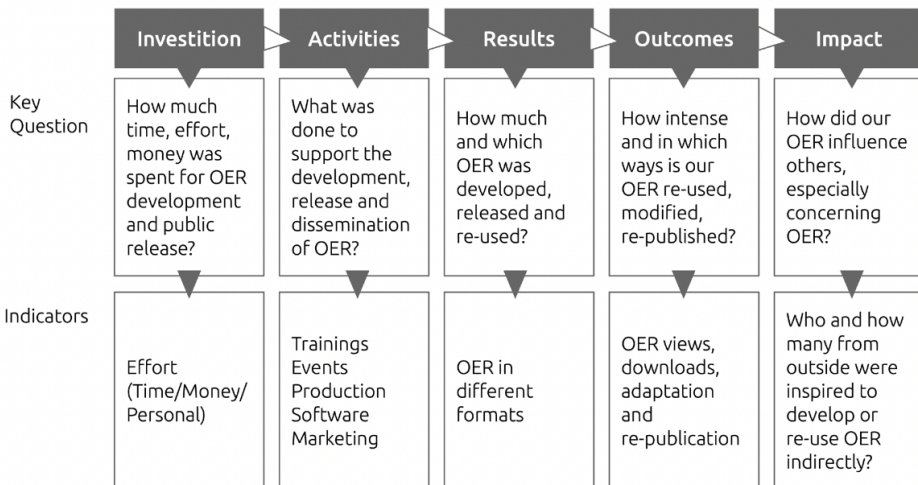


Figure 1: Potential key questions and relevant indicators from investments on the core of OER.

Source: Ebner, Orr & Schön, 2022, Fig. 4, [4, page 304].

Figure 1 shows key questions and indicators that are solely relevant for their OER aspect: The possibility to share, adapt, and download the existing resources; or if someone is inspired by existing OER and starts to develop their own. For measuring the MOOC platform impact, developing a set of fitting key questions and indicators might be necessary.

3.2 A glimpse into literature: examples of impact research of MOOC platforms

The search for impact research in the field of MOOCs (using Google Scholar, searched in August 2022) yielded a few relevant hits. For example, one paper addresses the impact of MOOCs by analyzing the relationship between the use of a platform and students' grades [14]. Other papers explore, for example, the role of prior experience in MOOC use [1] or the impact of open publishing on MOOC degree recognition [12]. At the ERIC subject database, other relevant contributions include Hakami [8] describing how the use of a MOOC in teaching has extended traditional learning and Nascimbeni et al. [11] identifying different collaboration patterns that can develop through OER. Further snowballing research led to articles that have explored the impact of MOOCs, especially openly licensed MOOCs such as at iMooX.at [2]. For the iMooX.at platform, Ebner and Schön have reported on how novel design principles are developed (Inverse Blended Learning, [5]) or how MOOCs can be integrated into learning settings in various ways, some of which are also novel [6]. Similar developments, especially regarding learning innovations, also seem to play a role in other MOOC platforms, as indicated, for example, by the description of new forms of learning [9].

This initial literature review reveals very few works in the impact measurement of MOOCs that allow for broad adoption of content-related or also methodological considerations for the impact measurement of a MOOC platform.

3.3 The open issue: what is the relevant impact (at all)?

After looking at the different ideas in the literature, we tried to adapt Figure 1 concerning the iMooX platform issues. Investment, activities, results, and outcomes seems to be an obvious and straightforward way to define key questions and indicators. It is obvious that first, it needs to be clarified what is perceived as an impact in our specific case of the MOOC platform, see Figure 2. And beyond that, the question arises: Who can provide well-founded information about (possible) impact?

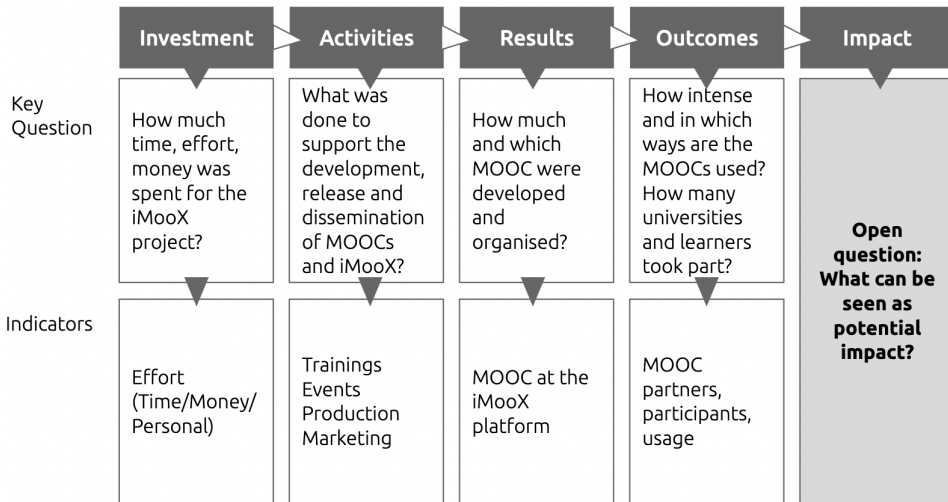


Figure 2: Potential key questions and relevant indicators from investments on iMooX to the open issue of “impact”.

4 Impact Measurement development for imoox

4.1 Overview of the activities of impact measurement

The following will present the approach taken with the MOOC platform iMooX.at. To illustrate the (potential) impact of the iMooX project or the same-named platform, the following steps were conducted:

1. In a first step, potentially relevant stakeholders of the iMooX.at platform or MOOCs where impacts might occur were identified.
2. At the same time, the activities, results, and outcomes of the iMooX.at project were presented descriptively. For this purpose, quantitative survey indicators were chosen, which, in addition to the number of MOOCs and the activities they contain, also record the number of participants in the MOOCs.
3. To identify possible variations and characteristics of the platform’s impact on the various stakeholders, five guided problem-centered interviews were conducted with selected Austrian MOOC creators at universities. Based on the interview results, a questionnaire with standardized question formats was developed.

4. The online questionnaire was sent to all course creators at iMooX.at and the gathered data was analyzed using descriptive statistical methods.

Overall, a conscious effort was made to be able to describe the quantitative aspects of the impact. This was also done to be able to make comparisons and describe developments in future surveys. The development of the method was carried out in a research cooperation with a colleague from the University of Graz and two students as well as with the help of the iMooX.at team.

4.2 Defining stakeholders

The starting point for researching possible effects was to consider which people and institutions might be “affected” by the MOOC creation, organization, and implementation at iMooX. These stakeholders represent the target group for the survey of possible impacts, i.e. expectations, objectives, changes, effects, or lessons learned. In the case of iMooX.at, there is one contact person for each (planned) MOOC, called “course creator”. This person may or may not also be the teacher responsible for the course content. Typically, the MOOC team includes several people, namely those who support the development of the course concept, the creation of the videos and the course materials, and the implementation or even the promotion of the MOOC. This team usually includes three to ten people, sometimes even more. During MOOC development and implementation, collaborations with other institutions, i.e. other universities, organizations, and individuals, occur, for example, in MOOC conceptualization, content creation (e.g. interviews/lectures with external parties), or also in MOOC promotion and recognition. Participants of MOOCs are often students of the MOOC-creating university but may also be students from other universities. In addition, some MOOCs are offered to working professionals and are therefore not directly designed for students. The MOOCs at iMooX.at can also be used as OER by other institutions or universities without any dedicated cooperation. Thus, parts of a MOOC can be integrated into a course or participation in a MOOC can be part of a course. Figure 3 illustrates an example of a composition of different actors on which MOOC development and implementation can have an impact.

4.3 Exploring the potential impact through interviews

To identify possible variations and characteristics of the platform’s impact on the various stakeholders, we conducted problem-centered interviews with our key stakeholder, the “course creators”. In developing the guidelines, we ensured that in each interview there is enough space and time to ask about impacts for all stakeholders involved.

Table 1: Structure and guiding questions of the problem-based interview

Impact on the creator (interview partner)	1.1 Please report on your own MOOC. What course did you create, and what did you look for when creating it?
	1.2 Please tell us what motivated you to create a MOOC.
	1.3 Who was involved in the creation of your MOOC?
	1.4 What positive aspects or challenges have you experienced in creating or delivering MOOC courses?
Impact on the team / at their own university	2.1 What were the expectations within the team and your university for MOOC development and delivery?
	2.2 To what extent did these expectations become a reality?
	2.3 What effects did the MOOC creation and implementation have ? – On you personally? On the team? On your university?
Impact on the cooperation partners	3.1 What do you think were the expectations of your cooperation partners regarding MOOC development and implementation? (Why did they participate)?
	3.2 To what extent did these expectations become reality, can you assess that?
	3.3 What effects did the MOOC creation and implementation have on your cooperation partners?
Impact among the participants and other users	4.1 Who has participated in MOOCs and what do you think have been the effects of participation for the (different) people?
	4.2 What do you think are the effects of having people from outside your immediate scope participate in the courses?
	4.3 Do you know anything about other users, e.g. institutions that use course materials in their teaching or other institutions that have integrated the MOOC into courses or continuing education?
Conclusion	5.1 Have you already taken a MOOC yourself? If so, please report on your experience.
	5.2 Can you think of any other impacts we haven't touched on that your activities around MOOCs might have?

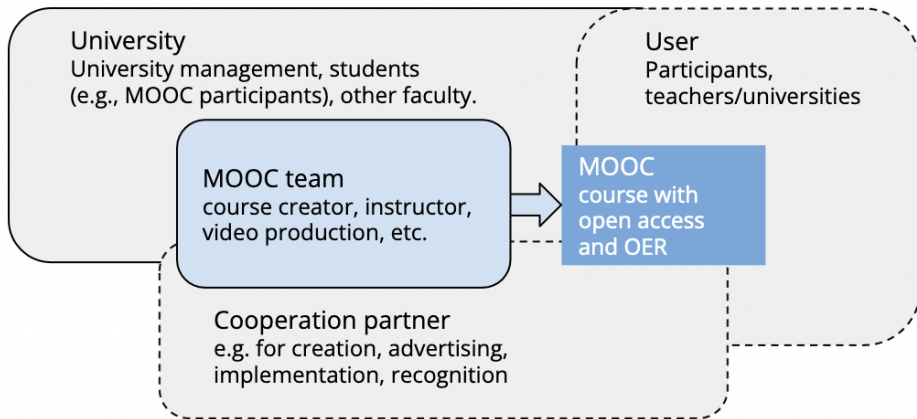


Figure 3: Identified stakeholders in MOOC development and implementation at iMooX partner universities.

Subsequently, five problem-centered interviews were conducted with selected MOOC creators. The interviewees were chosen in such a way that they had already (co-)developed several MOOCs. All interviews were transcribed, and a list of possible effects was generated, an excerpt of which is as follows:

- Changes in teaching and learning settings (e.g. flipped classroom).
- Sustainable teaching (reuse and adaptation of MOOCs).
- Increased motivation because there is interest in courses due to free choice.
- International standardization of course content by sharing MOOCs with other universities.
- Stronger networking with other universities (e.g. exchange or translation of MOOCs).
- Stronger networking with schools (especially HTL, Höhere Technische Lehranstalten, upper secondary schools in Austria with a technical background) for better preparation for studies).
- Stronger promotion of university content.

These and several more were collected, then sorted and transformed into a questionnaire with standardized questions.

4.4 Developing a questionnaire on the impact through standardized options

Like the previous approach, the questionnaire was designed to address the target group of MOOC creators. As a result, some questions are also carefully worded so participants do not need to commit to their answers – as they may only sometimes be able to answer them accurately. Again, as with the guideline, there are questions about the identified stakeholders in the questionnaire. The exact structure can be seen below as part of the result presentation.

5 Results after half of the project period

5.1 Activities and outcomes of the iMooX project

The project “iMooX – The MOOC platform as a service for all Austrian universities” started in March 2020. The number of project partners and the number of MOOCs offered are presented in Table 2. So far within the project duration, 41 MOOCs have been conducted by project partners and 29 MOOCs by other universities. In total, 70 MOOCs have already been carried out in the project or their production has started – this is far more than the goals stated in the project application (33 MOOCs including the non-binding letters of interest). The project activities also include the qualification of 125 people as certified course creators. Three so-called “MOOC summits” – one-day meetings with course creators with updates and workshops on the platform and project – also attracted around 70 participants. News about the platform and the courses have been distributed on the iMooX channels on Twitter, Facebook, and Instagram, and several publications about the platform have been published.

Table 2: Number of Austrian universities reached and their participation in MOOC production. Source: Internal documentation from iMooX. Source: [3, Table 1, p. 60].

Austrian universities and their MOOCs	Goals at project start 03/2020	Status 09/2022
Project partners (TU Graz, University of Vienna)	According to the application: 18 MOOCs	41 MOOCs
Austrian universities (not project partners)	Letters of intent on MOOC production from 15 universities	29 MOOCs from 20 universities (of which 10 universities with letters of intent) and 10 universities without LOI)

A total of 54,917 registered users are counted on the iMooX.at platform (as of September 2022). For the evaluation in Table 3, only such accounts were counted that can be clearly assigned to Austrian university members. Regarding the proportionally high number of MOOCs offered by the two project partners, it should be considered that both institutions not only provide a very large number of MOOCs, but also that Graz University of Technology has already been offering MOOCs on the platform since 2014 and the University of Vienna is the largest university in Austria (and thus can potentially reach more students). In the presentation, it should also be considered that accounts can also be deleted, and the related data is no longer available for data protection reasons, i.e. the data is not cumulative, but current data from the system. For this reason, it is also no longer possible to reconstruct how many accounts from Austrian universities there were in February 2020. The figures shown are snapshots; it is possible that more people were reached who unsubscribed again after successful participation. There is a clear increase in the number of universities that have produced or are producing MOOCs and in the number of universities that are officially using MOOCs. Additionally, the number of people from other Austrian universities registered is surprisingly high. Overall, the six-month period between the two surveys shows an increase of 8 for this target group, with around 1,400 additional university members registered.

Table 3: Number of Austrian university members reached (dedicated university accounts are counted here). Source: Internal documentation of iMooX.

Austrian university members from	Status 03/2022	Status 09/2022
Project partners (TU Graz, University of Vienna)	6.544	7.332
Universities that have produced or are producing MOOCs	5.914	6.481
Universities where MOOC use is known to occur	1.433	1.569
Universities where no official cooperation has (yet) taken place	2.825	2.725
Total	16.716	18.107

5.2 Impact analysis: Results of the survey among course creators

From July to August 2022, course creators were asked to participate in the survey on the effects of MOOCs. A total of 143 people were contacted, including those responsible for the first MOOCs in 2014 who, as it turned out, could no longer be reached using the contact details provided. Against this background and the fact

that the survey was conducted during the summer vacation, the response rate of 17 fully completed questionnaires (12 %) is satisfactory. The results have already been presented and published in German [3], so in the following Table 4 we will only present the questions and the distribution of the answers. This allows to equally recognize the structure and questions and, if necessary, to make comparisons between the data in the future. A question at the end of each section asked if anything else might be added as a potential effect. To round things off, an open-ended question was asked about possible negative effects. The answers to the open questions are not presented in this paper.

Table 4: Answers to the survey among course creators (n = 17). Note: We ranked the answers from least to most agreement in each section.
The data was originally published in diagrams in [3, Figure 4-10].

	agree	rather agree	neutral	rather disagree	disagree	don't know
When creating a MOOC for iMooX ...						
... I learned to pay more attention to comprehensibility/diction when teaching.	41,2	23,5	11,8	11,8	11,8	0,0
... I enhanced my digital skills.	58,8	11,8	11,8	5,9	11,8	0,0
... I learned new things in terms of the content of the MOOC.	58,8	11,8	5,9	11,8	5,9	5,9
... I extended my knowledge of OER and open licenses.	64,7	17,6	17,6	0,0	0,0	0,0
... I learned something new in general.	70,6	17,6	5,9	5,9	0,0	0,0
... I extended my knowledge of designing online courses.	76,5	11,8	0,0	5,9	5,9	0,0
I think when creating a MOOC for iMooX our MOOC creator team ...						
... learned to pay more attention to comprehensibility/diction when teaching.	31,3	18,8	31,3	0,0	6,3	12,5
... has enhanced their digital skills.	37,5	6,3	31,3	6,3	0,0	18,8
... extended their knowledge of OER and open licenses.	50,0	18,8	6,3	6,3	0,0	18,8
... learned new things in terms of the content of the MOOC.	56,3	6,3	12,5	6,3	0,0	18,8
... learned something new in general.	56,3	12,5	12,5	0,0	0,0	18,8
... extended their knowledge of designing online courses.	68,8	6,3	6,3	6,3	0,0	12,5
For our institution, the creation of a MOOC on iMooX.at ...						

	agree	rather agree	neutral	rather disagree	disagree	don't know
... has contributed to an increased exchange with companies.	6,3	0,0	18,8	6,3	56,3	12,5
... helped get staff interested in MOOCs and MOOC creation.	12,5	37,5	25,0	0,0	6,3	18,8
... has contributed to an increased exchange with other universities.	18,8	37,5	0,0	18,8	12,5	12,5
... has helped our institution to be perceived positively by the public.	31,3	18,8	12,5	0,0	6,3	31,3
... has helped to increase interaction with individuals outside the institution.	37,5	25,0	18,8	0,0	6,3	12,5
... has helped to increase interaction within the institution.	37,5	37,5	6,3	0,0	12,5	6,3
I think the participants in a MOOC at least						
... learned from the other participants.	25,0	6,3	18,8	25,0	0,0	25,0
... learned to learn/work more independently.	31,3	25,0	18,8	0,0	0,0	25,0
... benefited from the flexibility of content (individual modules can be used).	37,5	18,8	25,0	0,0	0,0	18,8
... enhanced their digital skills.	37,5	31,3	12,5	0,0	0,0	18,8
... participated because MOOCs are free of charge.	50,0	12,5	12,5	6,3	0,0	18,8
... benefited from the time flexibility.	62,5	18,8	6,3	0,0	0,0	12,5
... had a good experience with online learning.	68,8	18,8	0,0	0,0	0,0	12,5
... benefited from the spatial flexibility.	68,8	18,8	0,0	0,0	0,0	12,5
... learned new things in terms of the content of the MOOC.	87,5	6,3	0,0	0,0	0,0	6,3
For MOOCs you have created that are used in university courses, the following statements apply (this was applicable for n = 12)						
MOOCs are also used in other courses at other universities.	25,0	16,7	16,7	0,0	16,7	25,0
MOOCs are positively transforming teaching.	33,3	33,3	16,7	8,3	0,0	8,3
MOOCs as a component of courses relieve teachers.	41,7	16,7	16,7	8,3	16,7	0,0
MOOCs bring variety to teaching.	50,0	41,7	0,0	8,3	0,0	0,0
The use of MOOCs in courses opens-up a new didactic-methodological scope.	58,3	25,0	8,3	0,0	8,3	0,0

	agree	rather agree	neutral	rather disagree	disagree	don't know
For MOOCs offered as bridging courses, the following statements apply (this was applicable for n=5)						
MOOCs are more accessible to first-year students than face-to-face courses.	40,0	40,0	20,0	0,0	0,0	0,0
MOOCs prepare students well for their studies in terms of content.	20,0	80,0	0,0	0,0	0,0	0,0
To what extent do the following statements apply for MOOCs of the platform iMooX?						
No new "educational currency" can be developed by issuing MOOC certificates.	6,3	25,0	18,8	25,0	6,3	18,8
MOOCs do not contribute to the improvement of education.	25,0	0,0	0,0	12,5	62,5	0,0
The iMooX.at platform encourages the use of other MOOCs.	43,8	37,5	6,3	6,3	0,0	6,3
MOOCs promote sustainable development of educational materials because they can be reused/adapted.	75,0	12,5	6,3	0,0	6,3	0,0
MOOCs can reach a larger group of people for a topic.	81,3	12,5	0,0	0,0	0,0	6,3
MOOCs provide free access to education.	93,8	6,3	0,0	0,0	0,0	0,0
iMooX.at contributes to the dissemination of open educational resources.	93,8	6,3	0,0	0,0	0,0	0,0

As a summary, we will shortly emphasize the most important results concerning the effects of the MOOC developments and iMooX from the perspective of a course creator:

A critical insight from the survey is that most of the course creators have expanded their knowledge of online course design; the majority also learned something new and expanded their knowledge of open licensing. More than half have also learned something about the subject area of the respective MOOC as well as developed their digital skills. The statement that knowledge about OER and open licenses has been expanded among the course creation team receives the highest level of agreement. The statement that the team learned something new in general or in the subject area of the MOOC is confirmed by slightly more than half of those surveyed.

Regarding the effects on the institutions themselves, it is noticeable that overall they have not been affected to the same extent as the previous groups who

were directly involved (see Table 4). Accordingly, more than half see an increased exchange within and outside the institution because of the MOOC. Around half state that their own institution is perceived positively by the public because of the MOOC. In contrast, only one person indicated an increased exchange with companies, so this does not seem to be the norm.

Concerning the impact on participants from the point of view of the course creators, the most obvious effect on MOOC participants, namely that they have learned something about the MOOC topic in question, is confirmed. Almost all course creators also think that their participants had a good experience with online learning and benefited from the flexibility in terms of time and space and the fact that it is free of charge.

Some respondents ($n = 12$) have created MOOCs that were used as part of university courses. The majority here perceived statements such as an increase in the didactic-methodical scope, variety in teaching and positive change in teaching as an effect. Five course creators have implemented MOOCs as bridge courses that are intended to prepare first-year students when they transfer to higher education. In each case, they assume that MOOCs offer good preparation in terms of content and are also easier to access than face-to-face courses.

Regarding the general impact of iMooX.at and MOOCs, there is extraordinary approval for all five positively formulated statements, as well as a corresponding rejection of the two negatively framed statements. All respondents (tend to) agree with the statement that iMooX.at contributes to the dissemination of OER and thus enables free access to education. The majority confirms that MOOCs can reach a larger group of people, promote the sustainable development of learning materials, lead to the improvement of educational offers and encourage people to use other MOOCs as well. Around a third assume that MOOC certificates could also represent a new “educational currency”.

6 Discussion and Conclusion

With this paper, we have presented our thoughts on the possibilities of an impact analysis of a MOOC platform and the development and results of our implementation. Finally, it is necessary to evaluate our approach critically.

Even though the obvious result is to focus on course creators, this was not so clear at the beginning. We have also considered conducting surveys among users of the platform. The clear advantage of our approach is that it allows us to catch people with a relatively high level of insight. Of course, one major disadvantage is that course creators can only report from their perspective. The participants also

saw and addressed this problem in the interviews: It is difficult to assess the effects on third parties from their perspective.

It would be interesting to explore an even broader approach than in our case through problem-centered interviews with the course creators: Through conversations with participants, partners and external users, further (possible) effects could certainly be identified. Effects of MOOCs and the platform could also be integrated more strongly into user surveys in the future. At iMooX.at, these currently primarily contain general indicators of satisfaction with the MOOCs and the platform and do not address the effects of the MOOCs.

Acknowledgment

This report is based on an analysis carried out within the framework of the project “iMooX – The MOOC platform as a service for all Austrian universities” (2020–2023, partners: the Graz University of Technology, University of Vienna). Special thanks go to our colleagues and co-authors at the University of Graz, who contributed significantly to the impact analysis project by conducting the problem-centered interviews with course creators and developing the online survey.

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