

Eliciting the challenges and opportunities organizations face when delivering open online education: A group-concept mapping study



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ARTICLE INFO

Keywords:

Group concept mapping
Open online education
MOOCs
Higher education
Educational innovation
Organizational research

ABSTRACT

The global attention for open online education (OOE) caused a situation in which higher education institutions (HEIs) reconsider the way they deliver education to the population. With a funding policy, the Dutch Government aims to stimulate OOE in HEIs. The goal is to create more expedient, accessible and personalized learning experiences, that contribute to an improvement of quality of education and study success. However, many projects are failing to embed OOE within the institution. In this study, we elicited the challenges and opportunities of OOE projects within an organizational context of Dutch HEIs by using group concept mapping. Multidimensional scaling and hierarchical clustering resulted in a cluster map and a pattern match graph for interpreting the experts' ideas and opinions, clarifying and structuring the collective understanding. Core themes that represent the challenges and opportunities with regard to OOE identified in this study were: 1. *Online teaching*, 2. *Supporting mechanisms*, 3. *Assessment*, 4. *External target groups*, 5. *Educational flexibility*, 6. *Quality of education*, 7. *Institutional reputation*, and 8. *Educational efficiency*. The results indicated a skills gap among educators and a lack of central support for the development of OOE. Organizational efforts to implement OOE should take *educational flexibility* and *online teaching* into account and support mechanisms for OOE should be provided.

1. Introduction

The global attention and growth for open online education (OOE) caused a situation in which higher education institutions (HEIs) increasingly reconsider the way they deliver education to the population. Additional pressure to cope with this situation also arose from a growing global higher education market with increasing competition for students. To complicate things further, there is an ongoing rapid diffusion of technology, that gave rise to the development of new educational practices (Allen & Seaman, 2014; Christensen, Horn, & Johnson, 2008; Yuan & Powell, 2013). All these issues generated significant levels of interest in Massive Open Online Courses (MOOCs) as they offer a promising sustainable approach to open up online learning for students all over the world (O'Connor, 2014; Ossiannilsson, Altinay, & Altinay, 2016).

Correspondingly, the Dutch government aspires to remain open to these trends and developments in open and online higher education. This was announced more specifically in a letter issued in 2014 by Minister Bussemaker (Dutch Ministry of Education, Culture and Science, 2014) to the House of Representatives where it is stated that

OOE can serve as a driver of quality in diversity in education. Not only can OOE drive this through improving Dutch HEIs (international) reputation and by attracting talented teachers and researchers, but additionally through improving teaching by providing open access education, sharing educational materials, connecting with more individuals in informal contexts creating opportunities to transition to formal higher education or lifelong learning activities. However, she also states that there are still steps to be taken in order to capitalize on these opportunities. Since each institution has its own identity, each institution will only be able to determine which approach works best for them by experimenting, evaluating the outcome, and learning from it. Hence, in 2015, the Dutch government introduced a national funding policy that aims to stimulate better and more use of OOE in Dutch HEIs (Surfnet, 2017). The broader goal for this funding program is to create more expedient, accessible and personalized learning experiences for students, that contribute to an improvement of quality of education and increased study success. The funding will run from 2015 to 2018, with an annual budget of one million euro's, and a 2-million-euro budget in 2018. Yearly this funding program therefore produces approximately 8 to 12 OOE innovation projects initiated at accredited Dutch HEIs that

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have a runtime of 16 months at maximum and will be facilitated by SURF (semi-governmental non-profit organization for promoting and supporting the use of ICT in Dutch HEIs) (Surfnet, 2017).

In contrast to this ambition, the majority of HEIs are characterized by a highly institutionalized way of working, inhibiting innovations such as OOE. In many universities, even though there is funding, OOE is still seen as an added form of education and in some cases as a temporary project rather than becoming a central part of the educational model and strategy of the organization. On the other hand, there are some institutions that are beginning to experiment with OOE projects, like also the funded SURF projects. These institutions are choosing explicitly to participate in OOE because they pursued the funding for their projects, and have an explicit goal in mind and want to reach this by means of teaching open and online. It is, thus, important to unveil how these kinds of institutions need to engage with the expansion of OOE that can make or break the success on the short- and long term as well as its contribution towards the sustainable quality of education (Blackmon, 2016; Schneckenberg, 2009; Stevens, 2004).

An explanation for the lack of integration of OOE on an organizational level can be found in innovation adoption literature (Singh & Hardaker, 2014). According to the innovation diffusion theory by Rogers (2002), innovations have characteristics that affect the degree of adoption. The adoption of an innovation through perceived innovation characteristics of social system members explains the decision of innovation adoption. In other words, when close colleagues within your network already, in a sense, accepted characteristics of an innovation, the adoption by others will be influenced by this subjective perception. Rogers (2002) states that potential adopters' perceptions of an innovation's characteristics are more important than are objective measures of them, because 'most individuals evaluate an innovation not on the basis of scientific research by experts, but through the subjective evaluations of near-peers who have already adopted' (p. 990). In this light it is very important to consider these social system members that are closely related to, or working in collaboration with others on a regular basis, also known as near-peers within HEIs, in order to investigate OOE as innovation.

However, systematic research at the organizational level in the educational field is still lacking, and serious attention by the sector has not been given to structural implementation and adoption models when developing OOE (Blackmon, 2016; Veletsianos & Shepherdson, 2016). Existing research mainly centered around OOE (governmental) policy, institutional strategy and the demand side of OOE. For example, Hollands and Tirthali (2014) identified six main reasons why universities offer MOOCs: (1) for reaching a higher number of individuals through increased accessibility; (2) for increased branding opportunities; (3) financial improvement to HEIs; (4) they stimulate enhanced academic achievements; (5) promote teaching innovation, and (6) research on teaching and learning. These findings were also identified on a European level, but remained descriptive and non-explanatory (Brown, Costello, Donlon, & Giolla-Mhichil, 2015; Jansen & Schuwer, 2015; Punie, Dos Santos, Mitic, & Morais, 2016) or provided only a low predictable value about the supply side of MOOCs (Blackmon, 2016; Metcalfe & Sastrowardoyo, 2015). Correspondingly, Kalman (2014) described business models of free MOOCs compared to paid distance education, focusing more on the demand side of OOE. However, these and many other studies failed to shed light on the internal organization of the HEIs that plan to implement and develop OOE. In other words, different policy and institutional strategies were rather well explored, but the adoption mechanisms and the barriers and facilitators are still an open question.

In order to mitigate this gap in research, we conducted a study to discover the challenges and opportunities of implementing and running OOE projects within HEIs by examining the institutions that were granted a project following from the Dutch funding program. In the context of this funding program we adopt a broad definition of OOE in the current study, since the applicants for the funding program were

also given a broad definition of OOE to give them the freedom to design a OOE project based on their specific institutions' needs. The definition for OOE we therefore use in this study is the following: open online education is education that is substantially provided online, where materials are made openly available through open licensing (i.e. creative commons), and at least provided 'open' in terms of one of the following aspects: time (i.e. self-paced education), place (i.e. no specific physical location required), program (i.e. flexible learning path), access (i.e. no entry requirements) or free availability (i.e. no monetary obligation). Our research question consequently was:

What are the challenges and opportunities for OOE innovation projects within higher learning institutions as experienced by OOE project leaders?

To answer this question, we will investigate the funded OOE innovation-projects that aim to implement OOE within their respective HEIs. In the Netherlands there is a majority of public universities (i.e. 14 publicly funded, 1 privately funded), and universities of applied sciences (i.e. 37 publicly funded). The projects in our study are located at ten universities, and four universities of applied sciences, of which all are publicly funded. Because these projects cover almost all universities in the Dutch higher educational landscape, we assume that the impact of these projects and the funding program is substantial and representative for the Dutch higher education system.

Our research question can be answered from various perspectives since an organization consists of multiple stakeholder acting at different levels and within various (social and structural) boundaries. As found by previous studies, new studies should not model the adoption and diffusion of innovations in education based primarily on either a micro (i.e. individualist) or macro (i.e. organizational/institutional) perspective, but by using a more integrative approach to examine the complexity and multiple levels and dimensions of social reality (Singh & Hardaker, 2014). Therefore, we decided to take a look at an organization from a structuration theory perspective. The reason for this is that this theory provides a framework that generates a rich understanding when investigating phenomena in an organizational context, overcoming the common social sciences duality of the individual vs. the organization (Berends, Boersma, & Weggeman, 2003; Morris & Tsakissiris, 2017; Pozzebon & Pinsonneault, 2005).

The basic principle of the theory of structuration is the balance between structure and agency with neither one nor the other being dominant. The presumption is that social actors have a purpose and are knowledgeable individuals with the ability to make choices. These choices will be facilitated or hindered by structures of both a social and physical nature (Giddens, 1979; Giddens, 1984). We answered the question by exploring the experiences and views of OOE experts and project leaders because they can be recognized as knowledgeable actors in the implementation of OOE initiatives in their organization. They have a unique view on the organizational challenges and opportunities that arise and exist within these specific Dutch HEIs, dealing with the structural properties and the social practices that arise within their specific organizations.

The article is structured as follows. We will start with describing the group concept mapping (GCM) technique, a technique developed by Trochim (1989), and which is applied in our study. We will thereafter explain who our participants were, which procedure we followed and which instruments we used. Thereafter, we present the findings of the GCM, and report on the results. In the last section, we discuss the implications of our findings for research and practice, the limitations of our study, and next steps for future research.

2. Method

2.1. Group concept mapping

A technique to identify a group's shared understanding of a certain issue is Group Concept Mapping (Jackson & Trochim, 2002; Trochim, 1989). The approach is a structured method that includes both

quantitative and qualitative measures to create a participant-driven visual representation of ideas from the target group about a specific topic. Although GCM also has overlapping aspects in terms of other methods for consensus building, such as Delphi and focus groups, it overcomes some of their disadvantages. It also offers several advantages over existing word-based and code-based methods in terms of reliability (i.e. stability, reproducibility, accuracy) and validity (i.e. construct validity, sampling validity) (Jackson & Trochim, 2002). Opposed to the Delphi method, GCM involves only one phase of structuring the data, which is created solely by the participants, not by the researcher. Contrarily to the affinity diagram method, the participants work independently and anonymously, thus avoiding the negative effects of ‘groupthink’. Also, in contrast with the use of focus group data, GCM does not rely on researcher-driven coding schemes and does not need an inter-coder discussion. Instead, the participants code the text when they sort the ideas generated by themselves into groups (Hynes et al., 2015). In GCM, the researcher uses only the original participants’ statements as observational unit and then quantitatively aggregates these data through multidimensional scaling (MDS) and hierarchical cluster analysis. Consensus is voluntary; it develops objectively through the the multivariate statistical analysis. The GCM data collection procedure consists of five distinctive phases: (1) Preparation (2) Generation of statements (3) Structuring of statements (4) Data analysis, and (5) Data interpretation. A schematic overview can be found in Fig. 1.

Phase 1 involves two tasks that must be undertaken: (1) the researcher has to decide who will participate in the process; (2) it has to be decided what the specific focus for the conceptualization will be. After this is done the most central elements of group concept mapping can be undertaken; statement generation by means of brainstorming and structuring the statements by means of sorting and rating.

For the brainstorming phase, it entails the development of a focus statement. It is important to formulate a well-defined focus statement, so that all participants have a clear idea of what is expected from them. Therefore, the researcher needs to consider the results that this focus statement will produce during the brainstorming (e.g. take into account that the focus prompt will not generate double barreled statements). Once the focus statement has been defined, the criteria for the rating of the statement should be chosen. In this step it is important to consider what additional information would be most useful, depending on the purpose of the study.

In phase 2, participants will generate a set of statements during a brainstorm; this set ideally should represent the complete conceptual

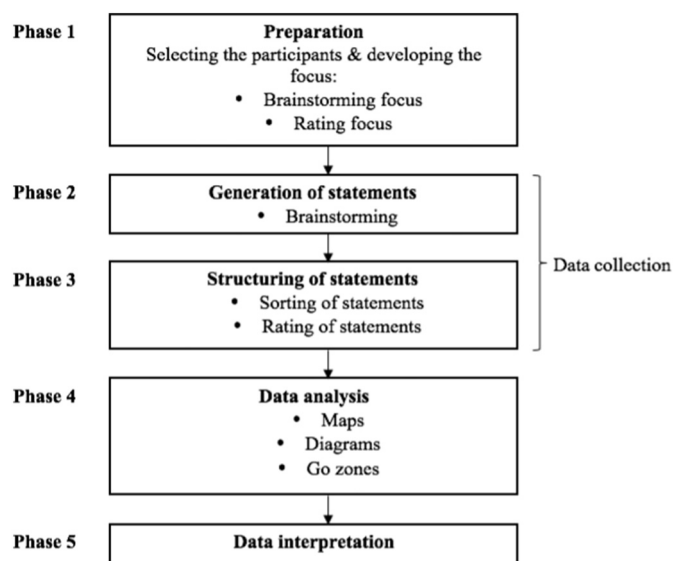


Fig. 1. Flow diagram indicating the process for group concept mapping (adapted from: Trochim, 1989).

domain for the topic of interest. In the brainstorm, participants will use the focus statement as a prompt for the session. Participants are encouraged to generate multiple statements, and are instructed that there should be no criticism or discussion regarding the legitimacy of statements which are generated during the session. It is common practice that the researcher collects all the generated statements and makes them available for the participants so everybody can view the set of statements as they evolve (e.g. this can be done in an online tool or manually via a blackboard). Editing typically is needed after the idea generation has been completed because the resulting list of ideas in most of the cases includes analogical statements, statements that contain more than one thought, or statements that are not relevant to the focus prompt. Taking what people have provided, the goal is to achieve a saturation of the topic of interest, assuring that the range of contributions is sufficiently broad yet targeted to the focus of the project and that the statements are clear and understandable across the entire stakeholders group. There are no limits to the number of statements, however, large amounts of statements put a large time burden on the participants in the following phase (i.e. sorting and rating). For this reason, by removing redundancies and double mentioned statements and using other techniques, the set of statements is reduced to contain about 100 statements which is considered an optimum (Jackson & Trochim, 2002). Set reduction can be done either by the researcher, or in accordance with the participants (Trochim, 1989).

In phase 3, the set of statements is structured in two steps: (1) sorting of all statements, and (2) rating of all the statements according criteria defined by the researcher. Sorting is based on an unstructured card sorting procedure (Rosenberg & Kim, 1975); that is, participants are instructed to sort the individual statements into so called piles “in a way that makes sense to you” and to give each pile a title or name. Restrictions are: (1) each statement can only be sorted in one pile; (2) all statements cannot be put into a single pile; and (3) all statements cannot be put into their own pile (i.e. one pile per statements). Except from these restrictions, participants can sort these statements in any way that makes sense to them, this can thus differ per individual participant. Rating is usually accomplished by using a Likert-type response scale (e.g. a 5-point scale) to indicate how much of the chosen criteria (e.g. importance and influence) is associated with each statement. Rating is done by the participants.

In phase 4, data analysis of the sorting and rating will take place using the aggregated input of the participants. Analysis of this data essentially consists of three steps. In the first step each statement is allocated as a separate point on a map (i.e. the 2-dimensional point map). Statements that are closer to each other on this map were sorted together more frequently by the participants; statements that are further apart on the map were sorted together less frequently (Trochim, 1989). In the second step a representation of the conceptual domain by means of hierarchical cluster analysis is produced (Trochim, 1989). Individual statements on the point map are grouped together into clusters which reflect similar concepts resulting in a cluster map. At this stage, it is important to determine—through an iterative process—which number of clusters have the best interpretation. In general, the goal here is to find the maximum amount of clusters that is still able to meaningfully allocate the statements within those clusters. The final step in this phase is obtaining the average ratings across participants for each statement and for each cluster. These can then be overlaid graphically on the maps to produce the point rating map, and consequently the cluster rating map. In total, after this analysis we then have several major products: the point map; the cluster map; the point rating map; and the cluster rating map. These will all be used as input for the data interpretation, that we do in phase 5.

2.2. Participants

Participants were 59 Dutch OOE experts on (higher) education and 22 OOE project leaders. The OOE experts were recruited through

Table 1
Overview of participant number in the GCM process.

	Started participants	Finished participants
Brainstorming	59	59
Demographic questions	27	25
Sorting	26	23
Rating: importance	23	22
Rating: influence	22	22

Table 2
Answers to demographic questions by participants of phase 2.

Participant question	Answer option	Frequency	%
Gender	Male	14	77.78
	Female	4	22.22
Job type	Project manager	5	22.73
	Policy officer/staff	1	4.55
	IT staff	0	0.00
	HR officer	0	0.00
	Teacher/lecturer/tutor	5	22.73
	Associate professor/Assistant professor	2	9.09
	Professor	3	13.64
	Researcher	0	0.00
	PhD candidate	2	9.09
	Educational developer/designer	1	4.55
	Other	3	13.64
Work experience innovation in educational sector		22	100.00
	None	5	22.73
	Little	2	9.09
	Somewhat	7	31.82
	Reasonable amount	3	13.64
	Large amount	5	22.73
		22	100.00

several channels, e.g., LinkedIn, Twitter, project websites, affiliated educational websites, personal contact, email etc., asking people involved and interested in OOE to contribute with their perspectives on organizational challenges and opportunities for OOE. The groups we approached consisted mainly out of educational researchers from Dutch HEIs, teachers in higher education, and members of special interest groups from SURF—a semi-governmental non-profit organization for promoting and supporting the use of ICT in Dutch HEIs. OOE project leaders were involved in running funded OOE innovation projects; these projects started in 2015 and in 2016 respectively. The OOE project leaders were recruited by addressing them directly to volunteer for this study. Both groups were well aware of the challenges and opportunities of OOE within the situation of HEIs in the Netherlands. The OOE experts ensured that the generated statements would be a valid representation of the complete conceptual domain of the topic of interest whereas the OOE project leaders ensured a reliable sorting and rating because of their experiences with the OOE innovation projects. [Table 1](#) gives an overview of the number of participants per step in the process. [Table 2](#) presents demographic data of the participants.

2.3. Procedure

Before starting the study, participants were informed about the purpose, the procedure, and the time needed to complete the specific steps. In addition, they were asked to confirm that they understood the instructions and agreed with the informed consent.

The OOE experts had one month to generate statements based on the focus prompt: “My institution has with regard to open online education the following challenge OR chance...”. Our experience with similar GCM projects indicates that it is more natural for the participants to generate ideas about positive and negative factors in one

brainstorming session rather than first collect ideas on opportunities and facilitators and then on challenges and obstacles. Another reason is that having grouped positive and negative factors together under a category identifying an issue provides a more meaningful and realistic context compared to long lists with either positive or negative factors associated with no concrete issues and sense of priority. A total of 149 statements were produced and this set was reduced by the researchers to 106 statement (see [Appendix A](#)). The OOE project leaders had to rate these remaining statements according to two criteria, namely importance and influence:

- Importance; how important is the premise as mentioned in this specific statement to realize OOE?
- Influence; how much influence does your institution/organization have on the premise as mentioned in this specific statement?

Sorting and rating was accomplished in two groups during face-to-face settings and took about 30 to 40 min for sorting and approximately 30 min for rating. Participants who failed to complete all steps were excluded from further analyses. Based on the collected data, the number of interpretable clusters was determined by means of the cluster replay map facility in the GCM tool. In every step in this process a careful thematic check was done to see whether splitting the specific statements in separate groups made sense based on the content they represent. Finally, all clusters were labeled with meaningful names.

2.4. Instruments

This study used the GCM online tool from Concept Systems Global. The individual contributions of the participants were aggregated to show patterns in the collected data by applying multidimensional scaling (MDS) and hierarchical clustering analysis (HCA). To analyze the data, we first used Ward's algorithm to do an agglomerative hierarchical cluster analysis. For this analysis nonmetric MDS uses the group proximity matrix and displays it as a point map on which statements are shown as points on a two dimensional plot with distances between them representing the frequency with which the participants sorted them together. Then, hierarchical cluster analysis on the MDS coordinates groups statements into larger categories that indicate underlying themes. Hierarchical cluster analysis starts with the assumption that all ideas are individual clusters, and subsequently combines statements until it appears at one cluster. Subsequently, the researchers need to look at the different cluster solutions proposed and decide on the number of clusters that represents the data in the best possible way and reflects the context of the study.

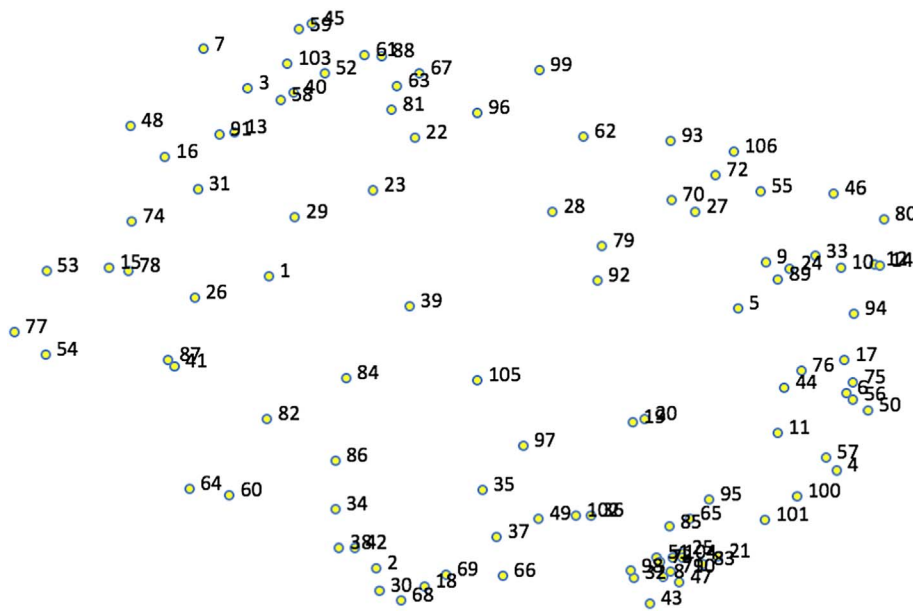
Visual representations of the data, in the form of maps, help to recognize the emerging data patterns and to interpret the data. These maps show how ideas are related to each other, and how much emphasis should be placed on a particular idea or cluster relative to other ideas.

3. Results

3.1. Point map

Set reduction resulted in 106 unique statements; these were sorted and rated by the project leaders. [Fig. 2](#) shows a point map of the sorted statements. The placing of the points on this map is based on bridging values calculated by the GCM tool. A bridging value is a value between 0 and 1. If statements have low bridging values, they are grouped close together and can be considered to cover similar content. If statements have higher bridging values, they are also grouped together but the surrounding statements are further apart. Thus, statements that are close to one another in the map are also close to one another in meaning and have been sorted together more often by the project leaders. To determine whether the point map represents the OOE project leaders'

Fig. 2. Point map of the sorted statements.



original, we look at the stress value also calculated by the GCM program. Typically, it is found that for GCM studies the stress value should be in the range between 0.205 and 0.365 (Rosas & Kane, 2012; Trochim, 1989,1993). The average stress value for this study was 0.2563 after 16 iterations. This value fell within the accepted range and, therefore, we concluded that the point map is a good representation of the original project leaders' sorting.

3.2. Cluster map

With the visual representation of the point map, some clusters of statements can already be easily distinguished. However, for the statements that are located further apart it is more difficult to discern them as a cluster. Therefore, we applied hierarchical clustering analysis, which produced an eight cluster solution to our point map which we labeled as: 1. *Online teaching*, 2. *Supporting mechanisms*, 3. *Assessment*, 4. *External target groups*, 5. *Educational flexibility*, 6. *Quality of education*, 7. *Institutional reputation*, and 8. *Educational efficiency*. These are depicted in a labeled cluster map in Fig. 3. Note that the dots in Fig. 3 may represent multiple statements when they are very close together. Appendix B gives an extensive list of the statements per cluster. Table 3 gives an overview of the clusters' statement count, average bridging values and range.

The GCM tool distributed each statement with a bridging value, and then aggregated those per cluster. Lower bridging values indicate coherence. Low bridging values were a result of the sorting by the

participants, who apparently sorted statements more often together. The most coherent clusters were *educational flexibility* (0.04), *external target groups* (0.26) and *quality of education* (0.28). Somewhat less coherent clusters were *supporting mechanisms* (0.30) and *institutional reputation* (0.39). The clusters with the highest bridging values and thus least coherence were *assessment* (0.49), *educational efficiency* (0.51) and *online teaching* (0.54). In order to get a better grasp of the different clusters, a more detailed description of their characteristic statements is given below.

3.2.1. Cluster 1

Online teaching contained eighteen statements with bridging values ranging from 0.35 to 1.00 ($M = 0.54, SD = 0.15$), which indicated that this cluster is diverse. In other words: participants did not associate them together in a very consistent way. This might be due to the fact that there was a clear mix of challenges and opportunities regarding the statements in this cluster. Most statements, however, dealt with aspects of the role of the teacher in an online setting (e.g. autonomy, preparation, student guidance and interactions) and missing or unclear conditions for teaching online (e.g. legal framework, quality criteria, support mechanisms, time investment, online teaching skills).

3.2.2. Cluster 2

Supporting mechanisms contained fourteen statements, and the bridging values ranged from 0.17 to 0.48 ($M = 0.30, SD = 0.09$). This clusters consisted of statements regarding the lack of support in various forms and on various organizational levels, so the vast majority was about challenges for OOE. Examples were, the lack of technical support and a fitting IT infrastructure for the development of OOE material, the lack of policies supporting OOE development, no available budget, and the absence of a clear strategic vision about OOE supported by the board.

3.2.3. Cluster 3

Assessment was a cluster that was also relatively diverse, with bridging values ranging from 0.27 to 0.72 ($M = 0.49, SD = 0.12$). The cluster contained fourteen statements in total. The statements in this cluster were mostly about learning analytics, assessment of OOE and additional criteria and conditions to do this correctly (e.g. larger scale of OOE is a challenge for feedback and assessment).

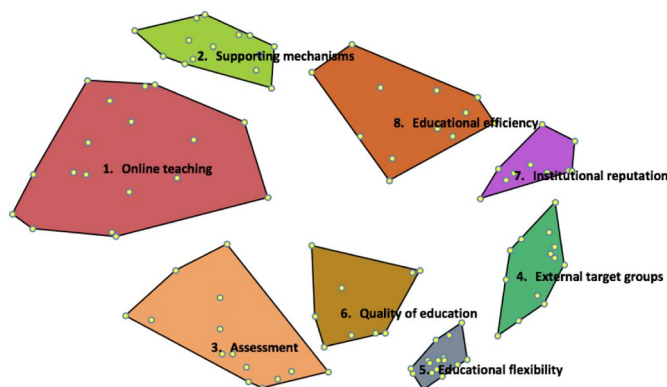


Fig. 3. Labeled cluster map.

Table 3

Description of the clusters. Clusters in red are mainly challenges, clusters in orange are ambiguous in terms of challenges and opportunities, clusters in green are mainly opportunities.

Cluster	Statement count	Bridging value mean	Bridging value standard deviation	Bridging value range
1. Online teaching	18	0.54	0.15	0.35–1.00
2. Supporting mechanisms	14	0.30	0.09	0.17–0.48
3. Assessment	14	0.49	0.12	0.27–0.72
4. External target groups	13	0.26	0.06	0.14–0.39
5. Educational flexibility	16	0.04	0.04	0.00–0.15
6. Quality of education	9	0.28	0.09	0.16–0.46
7. Institutional reputation	10	0.39	0.03	0.33–0.44
8. Educational efficiency	12	0.51	0.06	0.43–0.61
	106			

3.2.4. Cluster 4

External target groups was a relatively coherent cluster, in the sense that participants sorted the statements together often, which was also confirmed by the bridging values that ranged from 0.14 to 0.39 ($M = 0.26$, $SD = 0.06$). This cluster contained thirteen statements that were predominantly about reaching external target groups with OOE, like for example prospective students and pre-master students. Additionally, statements were also about serving the community, connecting education with the professional field or teach hard-to-reach target groups by means of OOE.

3.2.5. Cluster 5

Educational flexibility contained sixteen statements and was the most coherent cluster in the map with bridging values ranging from 0.00 to 0.15 ($M = 0.04$, $SD = 0.04$). This implied that the participants had a consistent association between the statements within this cluster. This also became even more clear when we looked at the content, because all of the statements were specifically about flexibility aspects of OOE, like for instance enabling personalized learning and being able to learn independent of place and time.

3.2.6. Cluster 6

Quality of education was the smallest cluster in terms of statement count, with only nine statements. The bridging values ranged from 0.16 to 0.46 ($M = 0.28$, $SD = 0.09$). What was interesting about this cluster was that all statements were about opportunities to enrich the quality of education. Examples of statements were “the enrichment of learning environment by OOE”, “being able to expand and enrich campus education”, “achieving the broader objective for education”.

3.2.7. Cluster 7

Institutional reputation was based on ten statements, and the bridging values ranged from 0.33 to 0.44 ($M = 0.39$, $SD = 0.03$), this indicates that this cluster was also very coherent according to the participant sort. Statements were mainly about the image of the institution, collaboration with other institutions and being able to profile the organization towards the outside world by means of OOE.

3.2.8. Cluster 8

Educational efficiency consisted of twelve statements with bridging values that ranged from 0.43 to 0.61 ($M = 0.51$, $SD = 0.06$). The topics mentioned in the statements are related to being able to make more efficient use of for instance learning material by means of re-use, more efficient use of educational spaces/buildings, and saving money by implementing OOE.

3.2.9. Cluster challenges versus opportunities

The focus prompt to generate the clusters was twofold. We asked the participants to generate statements that were organizational challenges or opportunities with regard to OOE. This made it relevant to look at the proportion of challenges and opportunities that are nested within

the clusters.

For the clusters *online teaching* and *supporting mechanisms*, the majority of statements within those clusters represent challenges (see [Appendix B](#)). For the clusters *assessment* and *educational efficiency*, there was a mix between challenges and opportunities, so those clusters represent an approximate equal amount of both and are mixed. For the clusters *external target groups*, *educational flexibility*, *quality of education* and *institutional reputation* the majority of statements clearly represented opportunities. [Fig. 4](#) depicts a visual representation of the distribution of challenges and opportunities per cluster.

3.3. Rating

The Go-Zone graph is a bivariate graph depicting the statements in a map where the x-axis represents the criteria influence and the y-axis the criteria importance; see [Fig. 5](#). With the information of the go-zone graph it is easily recognizable which statements are scoring high on both importance and influence, they are located in the upper right quadrant. Statements that fall within this so called go-zone should have a high impact on the success of OOE, and are also very much under influence by the organization. The proportion of clusters that are represented in the go-zone can be found in [Table 4](#) and [Appendix C](#) lists all statements that are located in the go-zone.

4. Discussion

4.1. Primary outcome measures: cluster map

The research question in our study was: “What are the organizational challenges and opportunities for open online education?”. The results of our study yielded several answers to this question and implications that we derived from eight clusters that represented the shared consensus among the project leaders about the organizational challenges and opportunities for open online education. These clusters

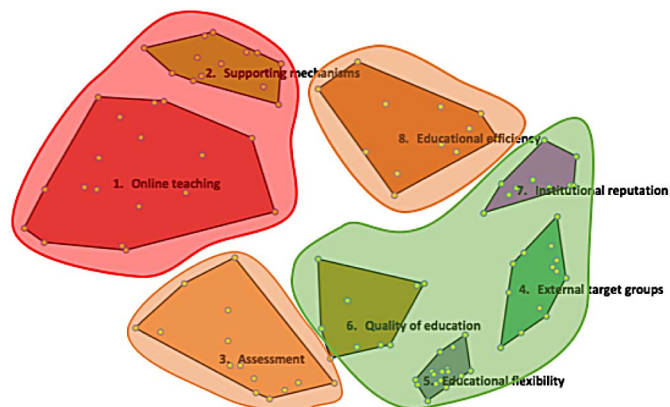


Fig. 4. Labeled cluster map by challenges and opportunities.

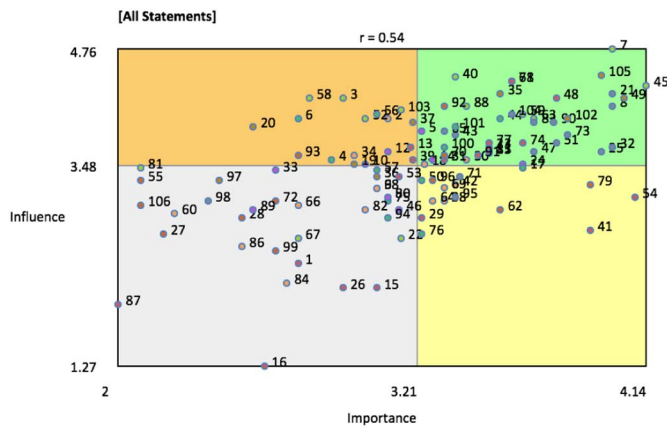


Fig. 5. Go-zone graph with individual statements.

were: 1. *Online teaching*, 2. *Supporting mechanisms*, 3. *Assessment*, 4. *External target groups*, 5. *Educational flexibility*, 6. *Quality of education*, 7. *Institutional reputation*, and 8. *Educational efficiency*.

With regard to the biggest challenges of open online education, we found the strongest results in the clusters *online teaching* and *support mechanisms* since these clusters mainly consisted of challenges. In particular, since the cluster *online teaching* had the highest average bridging value (i.e. 0.54) it was the largest in area size on the map, and thus contained a diverse set of challenges regarding online teaching. This implied that this cluster is less coherent in terms of consensus among the project leaders. A potential reason for this is that *online teaching* is a cluster representing challenges on many various levels, which is confirmed by looking at the statements in this cluster. These statements ranged from learner/student related statements, to statements that are about the role of the teacher, and their attitudes and beliefs about online teaching and skills in designing and teaching in an online environment. These challenges from various levels of observation imply a broad skills gap and ambiguity about teaching online. Online teaching requires other capabilities of teachers, educational designers and students compared to existing traditional education, and is seen as a main challenge. An organization that aims to work with open online education could consider strategies and policies in order to overcome this skills gap and ambiguity about OOE. It remains the question how to organize this effectively, and what specific support would be needed on what levels, and for whom? This remains unclear in this exploratory study, where we don't establish any causal relationships.

The support needed becomes clearer if we look at the cluster *support mechanisms*. With a bridging value of 0.30, this cluster was more coherent. This translates into on the one hand a need for technical support (i.e. ICT, recording of material, designing online modules), and on the other hand a demand for a higher level of support in terms of organizational vision, strategy alignment, and policies that support the development of OOE. This suggests that an organization should not only steer on development and training of technical, hands-on online OOE teaching skills among teachers and staff, but that there also is a need for

a broader type of support from a higher level of the organization in order to implement OOE.

Next to identified challenges, also opportunities were clearly captured in the cluster map. The clusters that had a majority of statements representing opportunities were *external target groups*, *educational flexibility*, *quality of education* and *institutional reputation*. The clusters *external target groups* and *institutional reputation* were more outwards oriented, and dealt with, for example, reaching remote learner groups and increasing brand awareness and enhancing the reputation of an institution. This implies that the project leaders identified the opportunities of open online education that reach beyond the limits of their own institutions. The question however is, if this is also an opportunity that is recognized on higher levels of the organization, and if so, why OOE is not prioritized higher on the strategy list for most of the institutions within this study. The clusters *educational flexibility* and *quality of education* were more inward oriented. *Educational flexibility*, is the most coherent and well-defined cluster in the map, with a bridging value of 0.04. This means that the project leaders had very high consensus about the statements in this cluster, and sorted them together consistently. Statements are representing mostly opportunities with regard to increasing educational flexibility by being able to offer time- and place independent learning, flexible and personalized learning paths with a result that student autonomy increases. The implication from this cluster is that open online education could be seen as the answer to the sometimes rigid character of traditional educational programs. Organizations that choose to use OOE to could benefit from these opportunities are adding value to the learning experience for their existing student population, but also increase the appeal towards recruitment of new student groups. This is also in line with what we found in the cluster *quality of education*, that mostly is about the opportunities that OOE has to offer to enrich existing education with the addition of open online educational forms.

The clusters *assessment* and *educational efficiency* were inconclusive with regard to being either about mainly challenges or opportunities. This can be explained by looking into these clusters carefully. By inspecting the *assessment* cluster, the statements can be divided into two bigger topics, which may also explain the relatively less coherent cluster with a bridging value of 0.49. On the one hand the statements indicate that there were opportunities for developing assessment and do research with the help of learning analytics. On the other hand, this cluster also entails statements that indicate challenges in scalable assessment because of feedback difficulties and limited interaction in online environments when compared to traditional teaching environments. This again could imply that there is a lack of skills and knowledge to develop scalable assessment methods for online education, which is in line with what we observed in the first cluster *online teaching*. What organization could do to improve on this is for example develop training and support to teach their staff how to develop these aspects of open online education. This kind of support could even be developed between institutions, to also learn from experiences outside of the own organization. On the other hand, it would be a possibility to use open online education as a test environment to develop suitable

Table 4
Proportion of clusters represented by single statements in the go-zone.

Cluster	Total statement count	Go-zone statement frequency	Proportion cluster for the go-zone in %
1. Online teaching	18	7	38.89
2. Supporting mechanisms	14	7	50.00
3. Assessment	14	2	14.29
4. External target groups	13	4	30.77
5. Educational flexibility	16	13	81.25
6. Quality of education	9	4	44.44
7. Institutional reputation	10	3	30.00
8. Educational efficiency	12	2	16.67
	106	42	

assessment methods, learn how to work with online environments and learning analytics and capitalize on the opportunities that learning analytics potentially have to offer.

4.2. Secondary outcome measures: rating results

With the rating results (i.e. rating criteria: importance and influence) we wanted to investigate which issues are *important* with regard to OOE success and are within the circle of *influence* of HEIs. Issues that have high importance and easy to influence are the ones that should be prioritized on the OOE agenda of the HEI's; they can be found in the go-zone in Fig. 5. In this figure, we can see that this go-zone is dominated by statements belonging to the cluster *educational flexibility* and to a lesser degree by the cluster *support mechanism*. This implies that enabling flexible ways of learning are regarded as very important for the success of OOE, and that HEIs can influence this within the organization (i.e. time and place independent learning, flexible learning paths for student, personalized learning).

4.3. Links to institutional and strategic research

Most of the opportunities that we identified in this study were consistent with findings from global and European strategic institutional studies (Brown et al., 2015; Hollands & Tirthali, 2014; Jansen & Schuwer, 2015; Punie et al., 2016). On an institutional level, the main opportunities like for instance *educational flexibility*, *quality of education* and the more outward oriented clusters like *external target groups* and *institutional reputation* were recognized as reasons to embark on OOE. These opportunities were also identified in our study by the project leaders. However, these prior studies lacked insight in OOE adoption mechanisms, the barriers and facilitators for implementing OOE. In contrast, our study shed a new light on why these institutions experienced difficulties in the implementation process. These difficulties were elicited by identifying the challenging aspects of OOE by individuals who have hands-on experience with the implementation and development of OOE. We defined these individuals as 'knowledgeable actors' as proposed by Giddens' structuration theory. Giddens' unique perspective adds a new part to the existing institutional research, and can serve as a next step in making OOE a success within HEIs by focusing on the internal organizational needs. Although policy and strategic studies already paved the way, it is important to acknowledge that the hands on OOE work needs more than just ambitions translated into global and European policies. Our findings could give an indication that there is a need for specific support mechanisms, by which many challenges can be overcome. Therefore, we propose that not only top-down mechanisms like policies and funding should be in place, but that there is a need for attention and action with regard to bottom-up challenges like a skills gap and need for centrally organized support and clear vision.

4.4. Limitations and future research

The limitations of this study comprise of a small sample and the limitation it puts on generalizing the findings. Although we had enough participants during the brainstorming phase to generate a good representation of the conceptual domain, a higher number of experts involved in the structuration phase would have been preferred because that enables research into subgroups. Because the threshold for the size of sorting and rating groups is between 20 and 25 to have valid results (Trochim, 1989), in our study, this number of participants was too low to look into subgroups. For this reason, we will continue to collect more data from future OOE project leaders in order to enhance the validity

and reliability of the results. By continuing the collection of data we also aim to identify changes over time. Consequently, the next steps in future research is aimed to uncover the mechanisms, factors and variables that influence the challenges and opportunities for OOE in an organizational context.

Furthermore, as most of the participants in our study were from Dutch HEIs, that got a granted funding for their projects, the findings and recommendations is to be applied to institutions within the same context. In this light, it is important to mention the fact that those projects have an advantage over non-funded OOE initiatives. For instance, they did not only receive monetary funds in order to realize their goals, but they were positively benefitted because of the guided funding trajectory facilitated by SURF. This consisted of regular meetings, sharing lessons learned among each other and being able to participate in workshops or sessions to enhance skills or knowledge related to the project. Educators, educational designers and other professionals in HEIs that have no access to funding may even have more challenging aspects to their work in realizing OOE. The role of these funded OOE projects however is to be able to develop best practices, creating more awareness within their institutions, that in turn can help overcoming the challenges for OOE initiatives that are being developed independently of funding by means of disseminating and stimulating adoption of OOE.

5. Conclusion

In this study, we made an inventory the challenges and opportunities of OOE projects within an organizational context of HEIs in The Netherlands. The core themes regarding the challenges and opportunities of OOE that were identified in this study were: 1. *Online teaching*, 2. *Supporting mechanisms*, 3. *Assessment*, 4. *External target groups*, 5. *Educational flexibility*, 6. *Quality of education*, 7. *Institutional reputation*, and 8. *Educational efficiency*. These themes give insights on the practical priorities that were experienced by the target group thereby taking into account the importance and reciprocal existing relations between organizational challenges and opportunities for OOE within higher learning institutions. Additionally, it implies that there is still a long road ahead for HEI's to be able to fully embark on OOE and benefit from the opportunities that it has to offer. Although the reasons to deliver OOE and implement it in HEI's seem evident, both from other research and in this study, there is still a lack of broader implementation and adoption within the educational landscape and organizations themselves. Not only should policies on a governmental or global level be in place, but there is also a clear need for a deeper dive into the organizations that are targeted by these policies. For example, more guidance and action towards the local strategies and support that is needed to deliver OOE, and effort related to the adoption procedures that can yield a structural change towards quality of education by means of OOE. This can be reached by organizations to develop a clear vision towards the future of learning, the place OOE has in that, and a structural alignment and implementation of this vision towards institutional strategy, policy and practice. More research to identify how HEIs should do this and which mechanisms enable or inhibit this is still needed.

Acknowledgements

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

Appendix A. Demographic questions

1. For which organization(s) or institution(s) do you work?

Answer options:

Answer options not available due to anonymity of the participants

2. Which description fits your current position/job best?

Answer options:

- Assistant professor
- Associate professor
- Educational developer/designer
- HR officer
- IT staff
- PhD candidate
- Policy officer/staff
- Professor
- Project manager
- Researcher
- Teacher/lecturer/tutor

3. Which project are you involved in?

Answer options:

Answer options not available due to anonymity of the participants

4. Do you have any previous experience with regard to educational innovations and/or technology within the context of education or learning?

Answer options:

- No
- Yes, but very limited
- Yes, some experience
- Yes, a fair amount of experience
- Yes, a lot of experience

Appendix B. Organizational challenges and opportunities of open online education and subsequent classification in clusters with their corresponding statements (in Dutch)

Cluster	Statements
Online teaching	<p>1. Veel bestaand materiaal dat in huidig onderwijs gebruikt wordt is gelicenseerd en niet geschikt om te delen in OOO</p> <p>13. Er is onvoldoende ondersteuning om OOO te kunnen ontwikkelen zonder concessies te doen aan kwaliteit van onderwijs</p> <p>15. Ontbreken van formele kwaliteitscriteria om OOO op te beoordelen zoals wel bij traditioneel onderwijs het geval is (bijvoorbeeld: accreditaties)</p> <p>16. Een ontbrekend wettelijk kader voor online onderwijs</p> <p>23. Doelstelling waarom OOO in te zetten is onduidelijk onder docenten</p> <p>26. Geen brede erkenning (formeel en informeel) van de kwaliteit van MOOCs en hun bijdrage aan onderwijs in Nederland</p> <p>29. Terughoudend om onderwijsmaterialen te delen</p> <p>31. De verdiensten van OOO (in welke vorm dan ook) zijn onduidelijk voor docenten</p> <p>39. Docenten kunnen bredere erkenning krijgen voor meer dan alleen hoorcolleges</p> <p>41. De rol van de docent verandert</p> <p>48. Beschikbare tijd voor docenten om OOO te i.p.v. traditioneel onderwijs te ontwikkelen</p> <p>53. Autonomie van docent behouden</p> <p>54. Online interacties vereisen andere skills van docenten dan in traditioneel onderwijs</p> <p>74. Campusonderwijs vergt een andere inzet (voorbereidingstijd, begeleiding, etc.) dan online onderwijs, verschil in workflow wordt nog vaak niet ingezien</p> <p>77. Skills/vaardigheden m.b.t. online doceren zijn vaak afwezig of in beperkte mate aanwezig zijn</p> <p>78. Het kunnen werken met OOO opnemen in docent professionalisering</p> <p>87. Er zijn weinig studenten die na een MOOC een betaalde (online) cursus gaan doen</p> <p>91. De consequenties van hergebruik en publiceren goed kunnen begrijpen (auteursrecht, beleid)</p>
Supporting mechanisms	<p>3. Onduidelijkheid over het Inzetten van reguliere onderwijsbudgetten voor de incidentele investering in OOO</p> <p>7. Goede technische faciliteiten voor opnames en editing</p> <p>22. Het onderhouden van digitaal lesmateriaal kost potentieel meer tijd dan klassiek lesmateriaal</p> <p>40. Er is geen duidelijk beleid op instellingsniveau m.b.t. OOO</p> <p>45. Organisatie van IT-ondersteuning</p> <p>52. Er is geen budget beschikbaar voor OOO-initiatieven</p> <p>58. OOO is geen deel van de strategische agenda van de universiteit</p> <p>59. Ondersteunende afdeling met veel ervaring</p> <p>61. Support van bestuur/CvB voor OOO-initiatieven</p>

	63. Infrastructuur voor OOO (bijv. weblectures/editing)
	67. Ontbreken van een centraal platform voor OOO
	81. Sterke focus op parapedaardje-moocs staat duurzame innovatie in de weg
	88. Ondersteuning voor OOO (bijv. weblectures/editing)
	103. Kennis binnen de instelling over auteursrechten/creative commons licenties
Assessment	2. Participatie verhogen door gebruik van credits/studiepunten
	18. Het kunnen gebruiken van learning analytics om onderzoek te doen naar leren
	30. Werken met learning analytics om onderwijs te optimaliseren
	34. De kwaliteit van toetsing (de gehele toets cyclus) te borgen
	38. Testmethodes ontwikkelen die op afstand valide en betrouwbaar zijn
	42. Kwaliteit student interactie in online omgeving
	60. OOO vergroot de afstand van studenten t.o.v. docenten en medestudenten waardoor feedback en begeleiding lastiger is
	64. Docentcontact onderschatten
	66. Gewenning van studenten aan OOO zodat ze er als vanzelfsprekend het maximale uit kunnen halen
	68. Gebruik maken van learning analytics om zo assessment formatief, schaalbaar en persoonlijk te maken
	69. Meer over studenten/lerenden te weten komen door data te analyseren"
	82. Kunnen toetsen en certificeren van OOO
	84. Open onderwijsmarkt is wezenlijk anders dan de markt voor betaald (traditioneel) onderwijs
	86. Potentieel grote schaal van OOO is een uitdaging voor behoud van kwalitatief goed onderwijs
External target groups	4. OOO kan overgang van VO naar HO makkelijker maken, leerlingen kunnen alvast 'proeven' van hun beoogde studie
	6. Content ontsluiten voor niet-studenten om ze zo bij de opleidingen te betrekken
	11. Kunnen aanbieden van kwalitatief goed onderwijs aan eerder onbereikbare doelgroepen
	17. Kennisdeling niet alleen binnen maar ook buiten de instelling
	44. Kennis ter beschikking stellen aan de gemeenschap
	50. Contact kunnen maken met internationale studenten geïnteresseerd in studieaanbod van de betreffende instelling
	56. De inhoud van de opleiding concreet zichtbaar kunnen maken voor toekomstige studenten
	57. Verbinding met de beroepspraktijk kunnen maken door integratie hiervan in onderwijsmodules
	75. De internationalisering van het onderwijs
	76. OOO biedt ook mogelijkheden voor externen (bijv. start-ups) om aan de slag te gaan de beschikbare kennis
	94. Krachten van opleidingen en docenten verspreid over Nederland bundelen
	100. Sneller bijscholen van instromende studenten (in o.a. een pre-master)
	101. Doelgroep beter kunnen bedienen
Educational flexibility	8. Tijdsafhankelijk kunnen leren
	21. Studenten meer keuzevrijheid bieden
	25. Flexibel onderwijs dat in allerlei leerpaden past
	32. Gepersonaliseerd kunnen leren
	43. Keuzeonderwerpen gemakkelijker aan te bieden
	47. Studenten op eigen tempo laten studeren
	51. Bieden van een persoonlijker onderwijs
	65. Online onderwijs dat kan dienen als invulling van keuzeruimte"
	71. Meer autonomie voor de student"
	73. In staat zijn om meer maatwerk te leveren aan studenten middels OOO
	83. Plaats onafhankelijk kunnen leren
	85. Bestaand onderwijs aanwenden om studenten op te frissen op het gebied van reeds genoten onderwijs
	90. Flexibele leerweg aan kunnen bieden onafhankelijk van tijd en plaats
	95. Studenten excellent onderwijs (op onderwerp) bij andere instellingen bieden
	98. Het eigen maken van de stof door studenten zonder werkcolleges
	104. Bieden van flexibelere leerpaden, door gedeeltes van vakken op te kunnen nemen in een track
Quality of education	19. Bredere doelstelling van het onderwijs kunnen verwerklijken
	20. Een mogelijkheid om onderwijs en onderzoek te combineren
	35. Concept "flipping the classroom" uitbreiden binnen de opleiding
	36. Studenten leren zelf open materiaal te zoeken en te beoordelen op kwaliteit/bruikbaarheid
	37. Meer met beoordeling door peers werken
	49. Het kunnen aanbieden van een rijkere leeromgeving
	97. Onderwijs transparanter maken
	102. Kunnen verrijken van campus onderwijs
	105. Integreren van open online onderwijs in bestaande onderwijsaanbod
Institutional reputation	5. Om efficiënter te gaan functioneren als HO-instelling
	9. Koploper in vakgebied worden

	10. Betere samenwerking met andere instellingen wordt bevorderd
	12. Verhogen internationaal karakter van de instelling
	14. Profileren van de instelling als expert op bepaalde vakgebieden
	24. Meer uitwisseling van open online onderwijs tussen faculteiten en instellingen
	33. Ontdekken waar de eigen krachten liggen t.o.v. wat er bij andere instellingen wordt ontwikkeld
	46. Sterke reputatie op open online onderwijs
	80. Naamsbekendheid universiteit verhogen
	89. Inhoudelijke contacten met vakgenoten elders in de wereld
Educational efficiency	27. Kosten van OOO verlagen door samenwerking met bedrijven en bedrijfsopleidingen
	28. Metadatering van OOO
	55. Extra inkomsten genereren d.m.v. OOO door uitgeven van certificaten of badges voor behaalde resultaten
	62. Vindbaarheid van OOO
	70. Duurzaam publiceren van reeds bestaand leermateriaal
	72. OOO is een manier voor HO-instellingen om een betekenisvolle plaats in te nemen binnen de maatschappij
	79. Herbruikbaarheid van OOO
	92. Effectiever benutten onderwijsruimten en -tijd
	93. Met weinig financiële middelen toch iets goeds neerzetten
	96. Beheer van open onderwijsmateriaal organiseren
	99. Return on investment voor OOO niet duidelijk
	106. Geld verdienen met onderwijs buiten de eigen instelling

Appendix C. Statements located in the go-zone per cluster (in Dutch)

Cluster: Online teaching

- 23. Doelstelling waarom OOO in te zetten is onduidelijk onder docenten
- 31. De verdiensten van OOO (in welke vorm dan ook) zijn onduidelijk voor docenten
- 48. Beschikbare tijd voor docenten om OOO te i.p.v. traditioneel onderwijs te ontwikkelen
- 74. Campusonderwijs vergt een andere inzet (voorbereidingstijd, begeleiding, etc.) dan online onderwijs, verschil in workflow wordt nog vaak niet ingezien
- 77. Skills/vaardigheden m.b.t. online doceren zijn vaak afwezig of in beperkte mate aanwezig zijn
- 78. Het kunnen werken met OOO opnemen in docentprofessionalizing
- 91. De consequenties van hergebruik en publiceren goed kunnen begrijpen (auteursrecht, beleid)

Cluster: Supporting mechanisms

- 7. Goede technische faciliteiten voor opnames en editing
- 40. Er is geen duidelijk beleid op instellingsniveau m.b.t. OOO
- 45. Organisatie van IT-ondersteuning
- 59. Ondersteunende afdeling met veel ervaring
- 61. Support van bestuur/CvB voor OOO-initiatieven
- 63. Infrastructuur voor OOO (bijv. weblectures/editing)
- 88. Ondersteuning voor OOO (bijv. weblectures/editing)

Cluster: Assessment

- 18. Het kunnen gebruiken van learning analytics om onderzoek te doen naar leren
- 30. Werken met learning analytics om onderwijs te optimaliseren

Cluster: External target groups

- 11. Kunnen aanbieden van kwalitatief goed onderwijs aan eerder onbereikbare doelgroepen
- 44. Kennis ter beschikking stellen aan de gemeenschap
- 100. Sneller bijscholen van instromende studenten (in o.a. een pre-master)
- 101. Doelgroep beter kunnen bedienen

Cluster: Educational flexibility

- 8. Tijdsafhankelijk kunnen leren
- 21. Studenten meer keuzevrijheid bieden
- 25. Flexibel onderwijs dat in allerlei leerpaden past
- 32. Gepersonaliseerd kunnen leren
- 43. Keuzeonderwerpen gemakkelijker aan te bieden
- 47. Studenten op eigen tempo laten studeren
- 51. Bieden van een persoonlijker onderwijs
- 65. Online onderwijs dat kan dienen als invulling van keuzeruimte
- 73. In staat zijn om meer maatwerk te leveren aan studenten middels OOO
- 83. Plaat onafhankelijk kunnen leren
- 85. Bestaand onderwijs aanwenden om studenten op te frissen op het gebied van reeds genoten onderwijs
- 90. Flexibele leerweg aan kunnen bieden onafhankelijk van tijd en plaats
- 104. Bieden van flexibelere leerpaden, door gedeeltes van vakken op te kunnen nemen in een track

Cluster: Quality of education

- 35. Concept “flipping the classroom” uitbreiden binnen de opleiding
- 49. Het kunnen aanbieden van een rijkere leeromgeving
- 102. Kunnen verrijken van campus onderwijs
- 105. Integreren van open online onderwijs in bestaande onderwijsaanbod

Cluster: Institutional reputation

- 5. Om efficiënter te gaan functioneren als HO-instelling
- 14. Profileren van de instelling als expert op bepaalde vakgebieden
- 24. Meer uitwisseling van open online onderwijs tussen faculteiten en instellingen

Cluster: Educational efficiency

- 70. Duurzaam publiceren van reeds bestaand leermateriaal
- 92. Effectiever benutten onderwijsruimten en -tijd

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