



# Understanding the Value of MOOCs from the Perspectives of Students: A Value-Focused Thinking Approach

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**Abstract.** This study aims to identify the values of MOOCs in education from students' perspective in China. The value of Massive Open Online Course (MOOCs) can be seen as the benefits associated with the use of MOOCs in education. To address this, we employed the Value-Focused Thinking (VFT) approach to identify the values of MOOCs with university students in China. Twenty active students of MOOCs were interviewed in China. Based on the data collected from the interviews, we developed a means-ends objective network describing the value of MOOCs in education. According to the results, efficiency in learning, effectiveness in learning, convenience of learning, learning experience of MOOCs, and usability of MOOCs were identified as the fundamental objectives to maximize values of MOOCs in education.

**Keywords:** Massive Open Online Course (MOOCs) · The value-focused Thinking (VFT) approach · Means-ends objective network · Value

## 1 Introduction

Massive Open Online Courses (MOOCs) can be seen as a technology enhanced innovation in online distance learning of higher education. MOOCs are defined as digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research [18]. More and more universities are offering MOOCs to their students. MOOCs use information technology to support interactions between the instructors and students, which may lead to enhanced learning outcomes. Since MOOCs are regardless of time and location, MOOCs provide students a new channel of acquiring educational resources. With the open environment, MOOCs enable a diverse group of learners to collaborate and learn together. MOOCs offer through platforms (e.g., Coursera, edX) on which allow students across the world to participate in the course. Many students have completed MOOCs successfully.

Although MOOCs are getting increasingly popular, there has been an ongoing debate about the educational values of MOOCs [7]. For instance, the high dropout rate

of participants is one of the major challenges of MOOCs [6]. Hew and Cheung [11] studied reasons why students sign up for MOOCs and why students drop the courses. They identified the following main reasons for dropping out MOOCs: lack of incentives, failure to understand the content material, having no one to turn to for help, and having other priorities to fulfill. The lack of a social environment that facilitates sustained student engagement has also been identified as a reason for high dropout rate [1]. Moreover, another criticism of MOOCs is the insufficient pedagogical approaches that are applied to design and run MOOCs [20]. Furthermore, individual's learning styles also have strong impact on the learning outcomes of MOOCs [9]. Some students may prefer to have face-to-face classroom teaching. These students may not be interesting in taking MOOCs. Last but not least, some teachers may have a lack of trust in technology associated with MOOCs [8]. Most previous research tended to focus on the adoption of MOOCs [10], and teaching and learning in MOOCs from a pedagogical perspective [12]. However, few studies tended to focus on the values of MOOCs from students' perspective. The purpose of this research is to identify the values of MOOCs from students' perspective. The research question of this research is: what are the values of MOOCs from the perspectives of students. To address this, we employed the value-focused thinking (VFT) to identify the values of MOOCs with university students in China. This is helpful to make the use of MOOCs with maximized values.

The rest of the paper is organized as follows. We present the literature review in Sect. 2. Section 3 illustrates the research method. Section 4 describes the application of the methodology and results of this study. We discuss the findings of the study in Sect. 5. Section 6 concludes this research and points out some future research directions.

## 2 Literature Review

The literature related to this research is discussed in this section.

### 2.1 Online Learning

Online learning is defined as learning that takes place partially or entirely over the Internet [17]. Online learning provides an alternative way in delivering knowledge. Online learning is designed to enhance the quality of learning experiences and outcomes [17]. Online learning has become popular because it enables learners to have flexible access to knowledge regardless of time and location. Previous studies have been carried out to study online learning from different perspectives. For instance, the authors [25] investigated the learners' perspectives of online learning. Some studies focused on the adoption of online learning (e.g., [13, 19]).

MOOCs can be seen as a form of online learning. Most MOOCs consist of relatively short video lectures and related content while feedback is managed either with peer-review and group collaboration or by automation [2]. MOOCs have two major features: open access to anyone, anywhere with Internet access [16, 26], and scalability, in which courses are designed to support an indefinite number of learners [21].

## 2.2 Research on MOOCs

There are some existing research works on MOOCs. For instance, the author investigated the adoption of MOOCs from the perspective of the institutional theory in China [10]. In [11], the authors studied motivations and challenges of using MOOCs. In [4], the authors studied the value of delivering MOOCs from key stakeholders' perspectives in Caribbean. Six stakeholders were interviewed in [4]. However, none of the interviewees had experience with MOOCs before. In [2], the authors explored factors that enhance an individual's intention to continue using MOOCs.

The success of MOOCs in education depends on the users' adoption of MOOCs. The sustainability of MOOCs is associated with the participation from key stakeholders involved in MOOCs (e.g., students and instructors). It is important to understand the benefits, weaknesses of MOOCs in educational settings. On one hand, the identified benefits and weaknesses are the important factors for the adoption of MOOCs. On the other hand, these benefits and weaknesses are also able to provide some insights for further development of MOOCs. This motivated us to further study the value of MOOCs in China.

To our knowledge, the literature on the usage of MOOCs in China is still developing and lacks comprehensive studies and empirical evidences. This research draws attention to value-focused thinking (VFT) to investigate the value of MOOCs from the perspectives of students in China. This research aims to complement and extend existing research by focusing on the value of MOOCs in the Chinese context. Furthermore, it is a continuing effort in studying the potential factors to enable students to use MOOCs, which would potential contribute to the existing research on the adoption of MOOCs.

## 3 Research Methodology

The value focused thinking approach [15] provides a method to identify values and structure the identified values systematically. Values are defined as principles used for evaluation by customers [15]. Values that are of concern are made explicit by the identification of objectives. An objective is a statement of something that one desires to achieve [15]. VFT approach can result in a means-ends objective network which can represent fundamental objectives and means objectives.

VFT is a decision technique developed by [15] where values are the primary focus of the decision-making process. VFT is designed to focus the decision-maker on the essential activities that must occur prior to solving a decision problem [14]. In this study, we aim to get insights of the essential activities that must occur to maximize the value of MOOCs in education from students' perspectives. Therefore, it is believed that VFT is an appropriate approach to address the research question. The VFT approach has been applied to the research in information systems, such as creativity in understanding users' privacy and security concerns with SNS [5], understanding the values of mobile technology of education [24], the values of live game streaming [27], and strategic implications of mobile technology [22].

The VFT approach is chosen to answer the proposed research question ‘what are the values of MOOCs from perspectives of students?’ as the approach helps identify value objectives.

The application of the VFT methodology in exploring students’ perspectives on the value of MOOCs in higher education can lead to a more comprehensive information collection which can result in an improved level of understanding of the value of MOOCs in education. The VFT approach is designed to identify what is important and how this can be achieved as it focuses on what the decision-maker cares about [14, 22].

In this study, we employed VFT approach as follows (see Fig. 1):



**Fig. 1.** Steps of VFT approach

- Step 1: Identify users of MOOCs. Getting information and insights from the users of MOOCs is significant to assure the accuracy of the values and objectives.
- Step 2: Develop a list of the initial value objectives and convert them into a common form. Several techniques such as wish lists, problems and shortcomings, alternatives can help conclude the possible objectives from the insights and make them easier to comprehend.
- Step 3: Identify the objectives and distinguish the fundamental objectives from means objectives. Fundamental objectives are the ends that decision makers valued in a specified context, while means objectives are methods to reach the ends. In the process of distinguish means objectives from fundamental objectives and build their relationships, Keeney suggested using the question “why is that important” [15]. For each value objectives, the question will result into two types of possible responses. One is that this objective is one of the essential reasons for interest in the situation, and it is the fundamental for decision making. That is called fundamental objective. Another response is that the objective is important because of its implication for other objective, which is called means objective [24].
- Step 4: Build the means-end network on the basis of the third step. The network provides a model describing the specified relationships between fundamental objectives and means objectives. According to this, analysts could find out how fundamental objectives can be achieved via means objectives. And the relationships presented in the network can help analysts to better understand the complex value system of decision makers.

## 4 Application of the Methodology

### 4.1 Data Collection

Data collection was done with students in different universities in one province in China. We invited students from different universities to participate in this study. As a result, a total of 20 students agreed to participate in this research. The VFT approach was applied to uncover the values of MOOCs in China from students' perspective. Interview questions were emailed to the participants two days before the scheduled interviews (see Sect. 4.3 for the questions).

### 4.2 Subjects

Twenty respondents participated in this research were university students in different majors and aged from 19 to 24 years old. They had taken MOOCs at the university before and had some experience with MOOCs. Therefore, it is believed that these participants could precisely comprehend our research questions and express their feeling about MOOCs, such as benefits, limitations and weaknesses.

### 4.3 Identifying the Value Objectives

Following the VFT approach, we interviewed the participants with the probing questions below:

What are the benefits of using MOOCs, and why is that important?

What problems have you faced in using MOOCs?

What encourage you to finish a MOOC?

If you have a chance to develop a MOOC, what features or functions do you want to add?

Using these questions, we collected an initial list of value objectives about MOOC. On the base of these initial list, we used the "Why is that important" test to explore and distinguish means objectives and fundamental objectives. The "Why is that important" test introduced subjects to think critically about the relationships between value objectives. The subjects need to think the essential reason why he or she uses MOOC. Until the subject said "I think the objective is important because itself is important", the test is done and the fundamental objectives have been identified.

Using the "means-ends" chain theory, the relationships between these value objectives had also been found out. The specific steps are as follows:

When one respondent mentioned "I think the reason why MOOC is attractive to me is that it gives me an opportunity to get access to the elite courses in famous schools", the researchers then asked "Why access to the elite courses is important to you in MOOC learning?" Respondents answered that "Elite teacher often has a more widely horizon than ordinary teachers in the same subject, they can use many cases or models to help us better understand the course materials.. In MOOC class, I not only have a chance to join these elite courses, but also can choose them on my own." The researchers then asked, "Why do you think having an opportunity to choose a course is important?" Respondents said "Learning behavior varies from person to person, and different teaching methods fit different learners. The traditional way of teaching is that

students only have to accept the teacher who arranged by school and his/her methods. While in MOOCs, students have opportunities to make their own study plans by select different courses and teachers.” The researchers asked “Why making a learning plan by yourself is important?” Respondents replied “Because I could be more efficient in my own learning pace”. “Why is efficiency important?” Respondents answered “The efficiency of learning is intrinsically important.”

In this example, after coding the interview content, the means-end chain is as follows: “Maximize participation of educational resources”, “Maximize alternative of courses”, “Maximize customized learning”, “Maximized efficiency in learning”. In the chain, the last “Maximized efficiency in learning” will be recognized as the basic fundamental objectives, and other value objectives are means objectives which use to achieve the fundamental objectives.

As the research data came from the dictation of the respondents, and each of them had his/her own way of expression, this may result in some misunderstanding. On the other hand, the data identification process could also been influenced by the subjectivity of researchers to a certain extent. In order to minimize the influence of subjectivity of researchers and increase the reliability of this research, another researcher had been invited to participate in the step of identification and classification of the value objectives.

Two researchers firstly conducted coding of six interviews, and identified fundamental objectives and means objectives from the interview material independently. Then the coding results had been compared, with 90% of the coding in the same. Some ambiguities caused by oral and written expression had been discussed. After an agreement was reached, one researcher coded the remaining interview material. Once the interview material coding in the previous step has been completed, three researchers reviewed all the coding results, merging duplicate values and removing the extra values. The results of the identification of value objectives were showed in Table 1.

#### 4.4 Identifying the Value Objectives

We have identified fundamental objectives and means objectives and their relationships in Sect. 4.3. The developed Means-Ends objective network is presented in this section (see Fig. 2). In the Means-Ends objective network, every means-end relationship has at least been mentioned by four respondents. This is to assure built Means-Ends objective network obtain main and common relationship [23].

## 5 Discussion on the Findings

This study used a qualitative research approach to understand the values of MOOCs in education from students’ perspectives (e.g., what do students expect with MOOCs in education), and developed a means-ends objective network that depicts these values and their relationships.

This paper contributed to previous literature. Firstly, to our knowledge, our study was one of the first studies that formally investing the values of MOOCs. Second, our study contributed to the existing literature on using value-focused thinking approach to

**Table 1.** The results of the identification of value objectives Fundamental

Objectives:
<b>Maximize efficiency in learning</b>
Example: Maximize time self-management
Maximize progress self-management
<b>Maximize effectiveness in learning</b>
Example: Maximize acquisition of knowledge
Maximize understanding of learning materials
<b>Maximize convenience of learning</b>
Example: Minimize time/location constrains for learning
Enable studying in fragmented time
<b>Maximize learning experience of MOOC</b>
Example: Maximize assistance from others
Maximize support from Internet
<b>Maximize usability of MOOC</b>
Example: Maximize ease of use of MOOC service
Maximize ease of search/navigation on MOOC platform
Means objectives:
<b>Maximize utilization of information technology</b>
Example: Maximize the presentation of course content with multi-media tools
Students' learning data can be collected in the background and be analyzed
<b>Maximize interaction in learning</b>
Example: Improve the interaction experience between students and instructors
Improve the interaction chance among students
<b>Enable online testing</b>
Example: Students can take test anytime and anyplace
Instructors can organize more quizzes, exams during the course
<b>Maximize immediate feedback</b>
Example: Maximize students' ability to get immediate answer
Maximize instructors' ability to offer real-time question/answering
<b>Maximize virtual collaboration among students</b>
Example: Maximize ability of collaborative learning tools
Maximize collaborative learning chance among students
<b>Maximize coverage area and connection speed of Internet</b>
Example: Maximize Internet access points
Maximize Internet connected speed
<b>Minimize learning equipment threshold</b>
Example: Enable MOOC learning in a low-cost computer
Enable MOOC learning in a low-cost mobile device
<b>Maximize accessibility of MOOC resource</b>
Example: Maximize access to MOOC services at any time
Maximize access to MOOC services at any place

*(continued)*

**Table 1.** (continued)

Means objectives:
<b>Maximize information sharing/communication</b>
Example: Maximize exchange of information among students
Maximize the communication of students and instructors
<b>Maximize student involvement in learning</b>
Example: Maximize students participation in learning
Minimize aloneness brought by online learning
<b>Maximize flexibility in time arrangement</b>
Example: Enable students arrange their learning time in demand
<b>Maximize flexibility in learning schedule</b>
Example: Enable students arrange their learning schedule in demand
<b>Minimize cost of learning</b>
Example: Minimize cost of purchasing course resource
Minimize other cost during MOOC learning
<b>Maximize participation of educational resources</b>
Example: Maximize the participation of instructors in MOOC
Maximize the participation of institutions in MOOC
<b>Maximize alternative of courses</b>
Example: Maximize varieties of MOOC courses (category, complexity) for students to choose
<b>Maximize customized learning</b>
Example: Enable students learn at their own pace
Provide personalized learning plan for each student
<b>Enhance usability of user-interface</b>
Example: Maximize ease of user guidance
Maximize ease of MOOC service
<b>Minimize language barrier</b>
Example: Provide mother language courses for students
Provide mother language subtitles for foreign students
<b>Maximize accuracy of course search</b>
Example: Maximize ease of course search engine
Enable users view course comments from others
<b>Maximize social recognition</b>
Example: Provide a MOOC course certification after finish learning
Maximize the influence of MOOC course certification



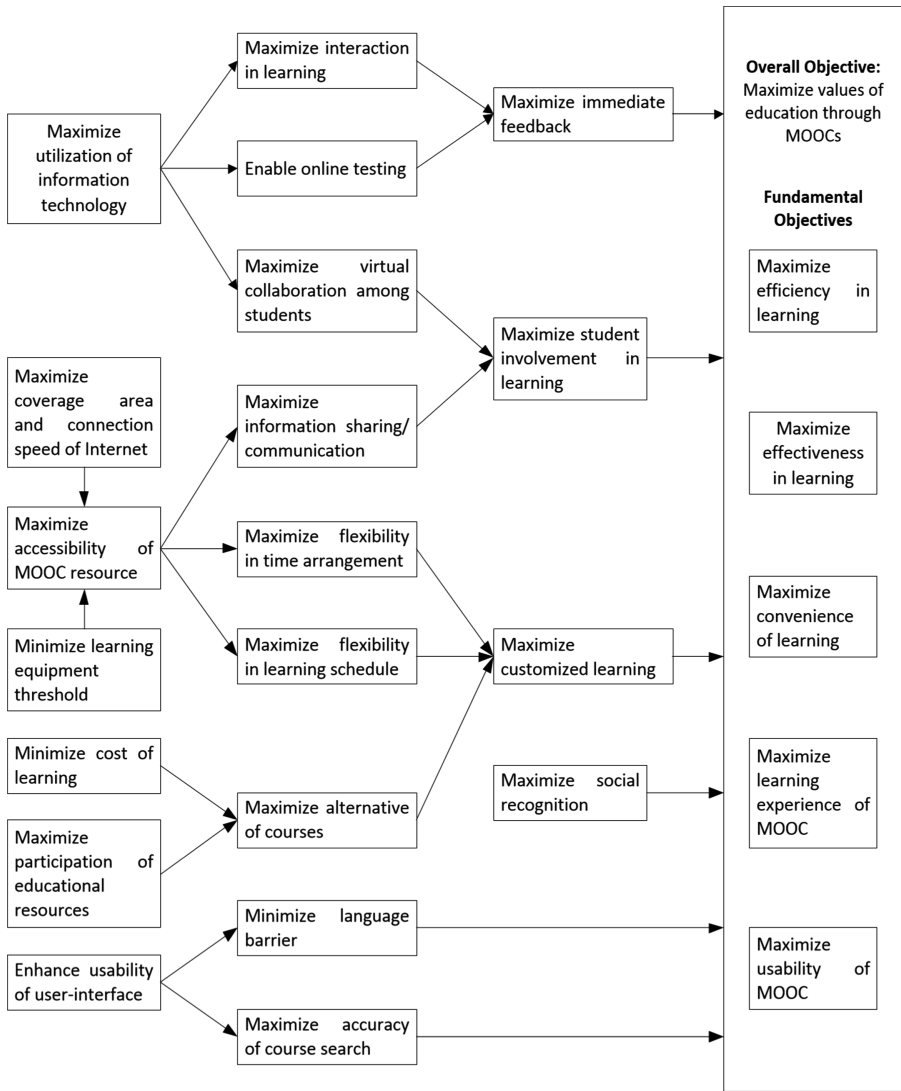


Fig. 2. Means-ends objective network

explore the values of innovational services. Lastly, we added new evidences of how students expect to benefit from using MOOCs in the competitive learning environment.

According to the results, a total of 25 objectives were derived from the collected data in the interviews. Efficiency in learning, effectiveness in learning, convenience of learning, learning experience of MOOCs, and usability of MOOCs have been identified as the five fundamental objectives to maximize values of MOOCs in education. Twenty means objectives were identified as important objectives to realize the derived five fundamental objectives.

The developed means-ends objective network also revealed some problems with MOOCs. For instance, students would like to have more interactions with teachers. There is limited contact between students and teachers. This is consistent with one of the findings in [4]. The authors indicated that teachers' active presence on MOOCs was needed [4]. The issue with the active engagement of teachers on MOOCs needs to be addressed. The university management team needs to find out a solution to encourage teachers' active engagement on MOOCs. Some students also indicated that better Internet connectivity and coverage on campus was needed to maximize the value of MOOCs. The university can make further investment to upgrade the broadband and network infrastructure on campus.

Another critical issue with MOOCs is the financial issue. Who is going to fund the hours instructors spent in developing MOOCs. Teaching a MOOC requires major commitment and distracts the instructors from their usual campus responsibilities. Concerning the sustainability of MOOCs, it is important for universities to obtain the revenue to operate MOOCs.

The results also provided some insights for decision makers at universities. In [3], the author argued that the use of VFT can improve decision making over traditional thinking. It is believed that the findings of this study would have impact to decision makers in the management and development of MOOCs. For instance, decision makers at university can get a better understanding of university students' expectation to maximize the value of MOOCs at an educational setting. Consequently, decision makers can assess the strengths and weaknesses of operating MOOCs to make further plans and investments in developing MOOCs in higher education. Furthermore, it can also help universities develop guidelines for students to take MOOCs.

## 6 Conclusion and Future Research

This study identified the value of MOOCs in education from the perspectives of students using VFT approach. It targeted university students since they were one of the key stakeholders with MOOCs. The results indicated that efficiency in learning, effectiveness in learning, convenience of learning, learning experience of MOOCs, and usability of MOOCs were identified as the fundamental objectives to maximize values of MOOCs in education in China.

We are also aware of some limitations of this study. The sample size of this study was quite small. Therefore, the generalizability of the results to other users remains to be determined. Secondly, the participants of this study were mainly between 19 to 24 years old. Although they can represent students of MOOCs to some extent, they may not reflect the total population of MOOCs' students in China.

We plan to refine the means-ends objective network by including other key stakeholders (e.g., teachers) views' on the value of MOOCs in the future. Furthermore, we also plan to identify the value of MOOCs in education from students' perspectives in some other countries.

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