



Utilization of MOOC for Subak Values Extension: Maintaining Balinese Local Wisdom in Modern Education

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ABSTRACT

Purpose of the study: To explore the use of Massive Open Online Courses (MOOC) as a medium for delivering Subak cultural values and to evaluate its effectiveness in increasing understanding, satisfaction, and relevance in the context of local wisdom preservation in digital education.

Methodology: This study applied a mixed method with a sequential explanatory design. Quantitative data were collected through Likert-scale surveys from 15 MOOC participants. Qualitative data were obtained through in-depth interviews and literature review. Thematic analysis and descriptive statistics were used to analyze the data.

Main Findings: Participants showed a high level of understanding of Subak values (mean score: 4.27) and were satisfied with the course delivery (mean score: 4.33). Interactive media such as videos and simulations supported better comprehension. Flexibility and accessibility were major strengths. Challenges include limited real-world interaction with Subak practices.

Novelty/Originality of this study: This study is the first to evaluate the integration of Balinese Subak cultural values into a MOOC framework. It offers a new perspective on how digital platforms can effectively support the preservation of intangible cultural heritage through structured online learning accessible to a global audience.

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1. INTRODUCTION

In the digital era, education has evolved from traditional concepts to more open and accessible formats. MOOCs are online professional development opportunities for teachers, enabling open access and international collaboration [1]-[3]. The Internet allows anyone, anywhere, to gain access to a wide range of knowledge without geographical limitations [4], [5]. MOOCs are online courses designed to be accessible to a wide range of students [6], [7]. Because digital-based education tends to emphasize universal and global information, local cultures are frequently disregarded in this environment. The Balinese employ a traditional irrigation method known as Subak, which delivers social, spiritual, and ecological benefits in addition to irrigation and embodies the principles of Tri Hita Karana, which are harmony between humans, nature, and the Creator [8], [9]. However, Subak's sustainability as a cultural treasure is being threatened by growing urbanization and globalization. Early MOOC research focused on outcomes valued in traditional higher education. These findings are discussed in the context of MOOC and higher education literature [10], [11].

MOOCs offer a potential solution in preserving and disseminating local cultural values such as Subak to a wider audience. As an open education platform, MOOCs enable online courses that can be accessed by anyone with an internet connection [12], [13]. MOOCs fall under open educational resources, offering digital materials for free for teaching, learning, and research [13], [14]. This is a great opportunity to integrate local wisdom into modern education that often focuses on global knowledge [15], [16]. On the other hand, the introduction of the Subak concept through MOOCs not only aims to provide an understanding of traditional irrigation techniques, but also conveys deeper values such as togetherness, ecological balance, and spirituality [8], [17]. MOOCs are more popular than traditional e-learning platforms because of their "massive" and "open" character [18], [19]. MOOCs can therefore serve as a conduit between the next generation and the cultural legacy that must be conserved.

Quizzes, examinations, videos, written assignments, and discussion boards are all common components of MOOC structures. Implementing local values in a digital setting is not without its difficulties, though. One major obstacle is how to ensure that the cultural values raised remain authentic and relevant when translated into different media [20], [21]. For example, many aspects of the Subak system relate to field activities and direct interaction with nature and the community, which may be difficult to fully convey through a digital platform [22], [23]. In addition, there is concern that the transformation of local values into online courses may lead to excessive reduction or simplification, so that the essence of the values is no longer intact.

Access, course design, student assistance, and recognition all contribute to MOOC success. However, some of these obstacles can be addressed by technology advancements and advances in MOOC systems. For instance, augmented reality (AR) and virtual reality (VR) technology can give students a more accurate understanding of Subak customs and values through a more engaging interactive experience [24], [25]. The Open edX platform serves as the learning environment for the 'Marine Litter' MOOC participants [26], [27]. MOOCs have the potential to produce a learning environment that is similar to the first-hand experience while giving consumers a deeper knowledge by leveraging interactive features like discussion forums, learning films, and digital simulations. This is important to ensure that complex cultural values are still conveyed accurately and engagingly [28].

With MOOC as a means of Subak value education, it is hoped that the younger generation can understand the importance of maintaining local wisdom amidst the increasingly rapid flow of globalization. MOOC not only facilitates the transfer of knowledge, but also strengthens cultural identity and pride in local heritage. Online teaching includes MOOC platforms, although it is still in the early stages of development [29], [30]. The use of MOOC for Subak value counseling is an innovative step in maintaining the sustainability of local culture, while integrating it into modern education [31]. As an effort that combines technology with traditional wisdom, this initiative is a form of respect for local culture which plays an important role in enriching the nation's identity [32], [33].

Although various studies have highlighted the importance of preserving inheritance culture through digital technology, the approach used generally still remains general and not yet in a way that specifically integrates local values like Subak into online learning platforms. For example, the Mu.SA (Museum Sector Alliance) project developed blended courses for practicing museum professionals in digital transformation, but the focus was more on developing digital competence without emphasizing preservation of local culture [34]. Similarly, a study by Cordell [35] discusses implementation technology in management and training for preservation inheritance culture, but not in a way that is special to studying integration of local values into online courses. In addition, MOOCs developed by Europeana aim for digital education with inheritance culture, but more focus on context in Europe and not on local Indonesian values like Subak [36]. This shows the need for research that is specifically developed and evaluates the effectiveness of MOOC in conveying local values like Subak to a wider audience. Research aiming to fill this emptiness with developing a MOOC designed specifically for conveying Subak values, evaluating its effectiveness in increasing participant understanding of Subak culture, as well as identifying challenges in conveying values through digital platforms.

This study aims to explore the use of Massive Open Online Courses (MOOC) as a medium for disseminating Subak cultural values in an effort to preserve the local wisdom of the Balinese people amidst the flow of educational modernization. The main focus of this study is to measure the effectiveness of MOOC in improving participants' understanding of Subak cultural values, as well as evaluating the challenges faced in conveying these values through a digital platform. In addition, this study also aims to explore participants' experiences during the MOOC course related to Subak and identify strategies that can be applied to ensure that these cultural values are conveyed authentically and relevantly. Thus, this study is expected to provide guidance for the development of technology-based learning methods that can support the preservation of local culture effectively.

2. RESEARCH METHOD

This study uses a mixed method. The type of mixed method used in this study is sequential explanatory design, which involves collecting and analyzing data sequentially by prioritizing quantitative data first, followed

by qualitative data to deepen the results of the analysis [37], [38]. Approach qualitative in study this done through study literature and interviews deep with the experts culture as well as Balinese people to identify perception and experience they about integration mark culture local in education digital -based, especially in MOOC. While that , approach quantitative done through survey to Balinese people who follow the related MOOC Subak , with objective measure understanding , appreciation to values culture Subak , as well as level satisfaction to method delivery digital materials using instrument Likert scale .

The population in this study was the Balinese community who had taken the Massive Open Online Courses (MOOC) with the theme of Subak. The research sample was determined purposively, namely those who had actually taken the course actively and could provide reflective responses related to the learning experience through MOOC. While there were 15 samples in the quantitative survey, 15 participants with a range of ages and professional backgrounds participated in in-depth interviews as part of the qualitative method to gain a deeper and more comprehensive viewpoint.

A five-point Likert scale (1 being strongly disagree and 5 being strongly agree) was used to format the quantitative survey as a questionnaire. The instrument was designed to measure three main variables:

- Understanding of Subak values (3–5 question items)
- Effectiveness of MOOC material delivery (3–5 items)
- Level of participant satisfaction with digital courses (3–5 items)

Quantitative data were then analyzed using descriptive and inferential statistics, and classified based on score ranges to assess the level of success of each variable. Interviews were conducted in a semi-structured manner, allowing researchers to dig deeper into participants' perceptions, experiences, and opinions regarding the integration of local cultural values in digital learning through MOOCs. Interview data were analyzed using thematic analysis techniques to identify relevant patterns and themes.

Table 1. Score Range Classification

Classification
1.00 – 1.80 : Very Low
1.81 – 2.60 : Low
2.61 – 3.40 : Enough
3.41 – 4.20 : Good
4.21 – 5.00 : Very Good

3. RESULTS AND DISCUSSION

The survey, administered to 15 Balinese people who took the MOOC, focused on three main aspects: understanding of Subak values, effectiveness of delivering the material in digital format, and overall satisfaction with the course. Here is a summary of the data from the survey:

Table 2. Descriptive statistical results of the survey on the use of MOOC in Subak value counseling.

Variables	Mean	Median	Percentage Distribution
Understanding Subak Values	4.27	4	The majority of respondents (46.67%) rated their understanding as very good, with an additional 33.33% feeling their understanding was good. A total of 20.00% were in the sufficient category.
Effectiveness of Material Delivery	4.13	4	Most respondents (46.67%) assessed the effectiveness of material delivery as good, while 33.33% assessed it as very good, and 20.00% felt it was quite effective.
Overall Satisfaction	4.33	5	As many as 53.33% of respondents felt very satisfied, while 26.67% considered themselves satisfied, and 20.00% felt quite satisfied with the MOOC course.

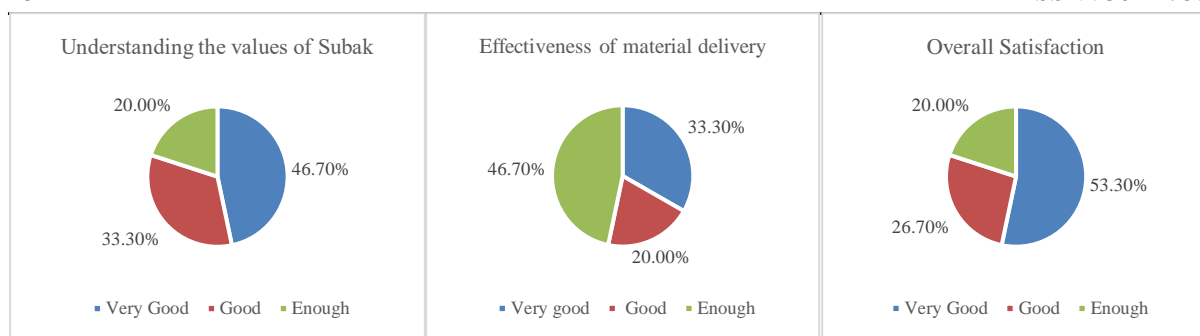


Figure 1. Piechart diagram of MOOC assessment points related to subak

From the survey results, it can be concluded that the average score for understanding Subak values is 4.4, material effectiveness is 4.3, and overall satisfaction is 4.3. The majority of participants showed a good understanding of Subak values and were satisfied with the delivery method through MOOC. For Qualitative results themselves Through in-depth interviews, participants conveyed some of their views and experiences related to the use of MOOC in learning Subak values. Here are some themes that emerged from the thematic analysis:

- **Appreciation of Local Values:** Most participants reported having a new understanding of the importance of preserving local culture after taking the course. Participants also stated that Subak values are very relevant in the context of modern life.
- **Physical Interaction Limitations:** Some participants felt that MOOCs lacked real-world experience because there was no direct interaction with the physical environment or the community that runs the Subak system. This made it a little difficult for them to fully understand the complexity of the values.
- **Convenience and Flexibility of Learning:** Most participants felt helped by the flexibility of time and place offered by MOOCs, allowing them to learn anytime and anywhere. This factor was one of the aspects most appreciated by participants.
- **Effectiveness of Interactive Media:** Interactive media such as videos, simulations, and quizzes greatly assist participants in understanding key concepts. Participants reported that they found it easier to understand the material presented with visual media and simulations.
- **The Role of Technology in Preserving Culture:** Many participants expressed positive views on the use of technology in preserving local culture. They felt that MOOCs could be an effective medium to introduce local cultural values to the younger generation.

Interviews were conducted with 15 participants who took the MOOC course on Subak. The participants came from various backgrounds and age ranges, with the aim of exploring their views on their learning experiences related to preserving local wisdom through a grouped digital platform. **Appreciation of Local Values** Most participants stated that they gained a deeper understanding of Subak values after attending the course. One participant, I Made, a young man from Bali, stated, "I previously only knew Subak as an irrigation system, but after attending this course, I understand that Subak is not only about water management, but is also related to the spiritual and social life of the Balinese people." This shows that the course successfully introduced the concept of Subak more broadly than just irrigation techniques.

Limitations of Physical Interaction Several participants expressed that although they were able to understand the material well through videos and written materials, they felt they lacked real-world experience of how these values were applied in the field. "I feel like I don't get a direct feel for how people interact with nature and water in the Subak system because everything is done virtually," said Nyoman, a Balinese farmer. This shows that direct experience, such as interacting with the Subak system in the field, is still considered important for deeper understanding.

Convenience and flexibility of learning however, many participants appreciated the flexibility provided by MOOCs. Wayan, a housewife who took the course, said, "This course really helps me to learn anytime, without having to leave my house or work. It gives me the freedom to learn without time pressure." The flexibility of time and place of learning through MOOCs is one of the features most appreciated by participants, especially those who have limited time due to other activities.

Effectiveness of interactive media participants also expressed that the use of interactive media such as videos, simulations, and quizzes was very helpful in understanding Subak concepts. "The simulation of how water flows in the Subak system really helped me understand the process visually. It's easier than just reading text," said Ketut, a teacher in Bali. The use of interactive media is one of the keys to improving participants' understanding of the material presented [39], [40]. The role of technology in preserving culture most participants felt that the use of technology such as MOOCs could be an effective means of introducing local cultural values to the younger generation. "MOOCs can reach people who do not live in Bali, giving them insight into the Subak culture. This is a great way to preserve local culture more widely," said Ni Luh, a student. Technology allows the course to overcome geographical boundaries and deliver cultural messages to a global audience [41].

Based on the interview results, it can be concluded that the use of MOOCs as a platform to disseminate and preserve Subak cultural values has great potential. Participants generally expressed appreciation for courses that allowed them to learn more about Balinese culture, although they also acknowledged the limitations in direct experience that cannot be fully met by digital formats. The convenience and flexibility of learning experiences are an added value for MOOCs, especially for those who do not have access to traditional educational resources or are hampered by time and location constraints. In addition, the use of interactive media such as videos and simulations helps clarify more complex concepts, making them easier to understand.

The MOOC used in this study, which focuses on disseminating Subak values, has limitations in terms of direct interaction with participants or the community implementing the values. Unlike some MOOCs used in other countries, which often utilize field experiences or physical interactions in their courses, MOOCs that focus on local cultures such as Subak face challenges in delivering authentic experiences digitally. The Subak system, which is closely related to direct interaction with nature and society, is difficult to fully understand only through digital materials without elements of real experience, as found in some MOOCs abroad that prioritize direct interaction and field practice in the learning process.

The results of this study, which show that the use of Massive Open Online Courses (MOOC) is effective in increasing the understanding of Subak values, are supported by various previous studies. Chen and Oakley in their study emphasized that MOOCs developed with local context in mind can significantly increase the relevance of the material and participant participation, as seen in the adaptation of a global course for a Chinese audience which resulted in increased participant understanding of the learning content [42]. This is in line with the findings in your study, where the majority of participants stated that they gained new insights into the spiritual and social aspects of Subak after participating in the MOOC. In addition, a study by Koutromanos et al. showed that direct participant involvement in the development of cultural content through digital platforms encourages a higher appreciation of cultural heritage [43].

Furthermore, the effectiveness of interactive media such as videos and simulations in helping participants understand is also reinforced by research by Kayaalp et al., who found that the design of virtual museums by prospective teachers increased appreciation of cultural heritage [44]. On the other hand, Restoule highlighted the importance of bringing local cultural perspectives into online learning environments to create authentic and meaningful learning experiences [45]. This supports your qualitative findings, which state that participants felt that MOOCs were not only flexible and accessible, but also could be an effective medium for introducing local cultural values to young people, despite the challenges in delivering authentic field experiences. This combination of quantitative and qualitative evidence strengthens the relevance and contribution of your research to the literature on culture-based digital education.

On the other hand, the MOOC used in this study has advantages in terms of flexibility and global reach. Unlike some MOOC courses in other countries that are limited by geographical accessibility or more general curricula, the MOOC that focuses on Subak cultural values can be accessed by anyone around the world, without being limited by location or time. This allows for the dissemination of knowledge about local Balinese culture to an international audience, including the younger generation who may not have direct access to the preservation of the culture.

MOOC research used to focus on technical and accessibility aspects, such as the provision of massive online courses for higher education. The main emphasis was on the effectiveness of video-based learning methods, quizzes, and discussions as a means of reaching a global audience. Today, MOOC research increasingly focuses on the integration of local culture into learning content, such as efforts to preserve Subak values in Bali. Innovative technologies, such as augmented reality (AR) and virtual reality (VR), are being used to create more immersive and interactive learning experiences. The focus is also shifting to preserving local culture through the digitization of education, where content is more contextual and authentic.

In the short term, MOOCs provide an impact in the form of increasing accessibility and flexibility of education, allowing users to learn anytime and anywhere. Participants also gain an initial understanding of local values, such as Subak, through digital media. In the long term, MOOCs can support cultural preservation by introducing local values to the younger generation and global audience. In addition, the development of interactive technologies allows for more authentic learning experiences, fostering pride in cultural identity and strengthening cross-generational understanding.

4. CONCLUSION

The results of the study indicate that MOOCs have great potential as a medium to disseminate and preserve local cultural values such as Subak. The average score of participant understanding reaching 4.4 and overall satisfaction of 4.3 indicates that most participants felt that the course was effective and able to increase their knowledge of Subak values. This is in line with the findings from the interviews which showed that the majority of participants had a new appreciation for local culture. The use of MOOCs as a learning medium can help overcome geographical limitations, so that local cultural values can be learned by the wider community,

including the younger generation who may live far from the cultural area. However, the results of this study also revealed challenges in using MOOCs for cultural learning that requires direct interaction with the physical environment. Several participants felt that without field experience, they had difficulty truly feeling and understanding the complexity of Subak values. This suggests that in order to achieve a deeper understanding, a more innovative approach is needed in delivering content. The use of AR or VR technology in MOOCs can be a potential solution, because this technology can provide a more immersive visual experience, allowing participants to “experience” the Subak environment virtually.

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