

CULTURAL HERITAGE DIGITIZATION OF BOROBUDUR AREA TOURISM: A PROJECT-BASED LEARNING

Irma Rasita Gloria Barus¹, Amata Fami², Kania Sofiantina Rahayu³

^{1,2,3}College of Vocational Studies, IPB University

Jl. Kumbang No.14, Babakan, Kota Bogor, Jawa Barat 16128

e-mail: irmabarus@apps.ipb.ac.id¹, amatafami@apps.ipb.ac.id², kanasofia@apps.ipb.ac.id³

Paper received: 2022-11-05

revised: 2022-11-21

accepted: 2022-11-21

Abstract: In supporting the efforts to preserve the nation's cultural heritage, this research aimed to implement project-based learning by designing e-books as digital information media to promote tourism development. This research attempted to report and illustrate the implementation of project-based learning, which aimed to explore twenty potential tourist attractions in the surrounding villages of the Borobudur Temple in Central Java, Indonesia. This research involved 127 students of the Informatics Management Study Program enrolled in the Graphic Design course. This qualitative case study exemplified the implementation of project-based learning in designing and digitizing information media in the form of a collection of e-books. The overall process consisted of three main stages, i.e., pre-production, production, and post-production. The stages included conducting preliminary research; formulating the concept of design; collecting visual and typographic references; outlining; performing the design and digitization; and presenting the final product. The data were taken from class observations and documentation from March to June 2022. By demonstrating the project-based learning model of preserving the cultural potential of twenty traditional villages surrounding the Borobudur Temple area in a digital environment, it is hoped that the digitized cultural heritage can be introduced to and recognized by wider audiences.

Keywords: cultural heritage, e-book design, graphic design, information media, project-based learning

Abstrak: Dalam mendukung upaya pelestarian warisan budaya bangsa, penelitian ini bertujuan untuk menerapkan pembelajaran berbasis proyek dengan merancang e-book sebagai media informasi digital untuk mempromosikan pengembangan pariwisata. Penelitian ini berusaha untuk melaporkan dan menggambarkan pelaksanaan pembelajaran berbasis proyek, yang bertujuan untuk mengeksplorasi dua puluh potensi daya tarik wisata di desa-desa sekitar Candi Borobudur di Jawa Tengah, Indonesia. Penelitian ini melibatkan 127 mahasiswa Program Studi Manajemen Informatika yang mengikuti mata kuliah Desain Grafis. Studi kasus kualitatif ini mencontohkan implementasi pembelajaran berbasis proyek dalam merancang dan mendigitalkan media informasi berupa kumpulan e-book. Keseluruhan proses tersebut terdiri dari tiga tahapan utama, yaitu pra produksi, produksi, dan pasca produksi. Tahapan tersebut antara lain melakukan penelitian pendahuluan; merumuskan konsep desain; mengumpulkan referensi visual dan tipografi; menguraikan; melakukan desain dan digitalisasi; dan mempresentasikan produk akhir. Data diambil dari observasi kelas dan dokumentasi dari bulan Maret sampai Juni 2022. Dengan mendemonstrasikan model pembelajaran berbasis proyek pelestarian potensi budaya dua puluh desa tradisional di sekitar kawasan Candi Borobudur dalam lingkungan digital, diharapkan warisan budaya digital dapat diperkenalkan dan dikenal oleh khalayak yang lebih luas.

Kata kunci: desain e-book, desain grafis, media informasi, pembelajaran berbasis proyek, warisan budaya

1. Introduction

Preserving the nation's cultural heritage has always been an important mission, particularly during rapid technological development. The impact of the pandemic of COVID-19 has aroused the trend of digitization, and this forced the economy and tourism businesses to be resilient and adaptive to thrive. Hence, the use of information and communication technology (ICT) has transformed the promotion of cultural attractions as they serve as a tool for improving a region's tourism development. As one of the principal areas of economic growth, travel and

tourism are worth exploring in studies, particularly to support the development and advancement (Middleton, Fyall, Morgan, & Ranchhod, 2009).

Moreover, there is a growing interest in digitizing projects of cultural heritage in Indonesia as it offers a solution to promote and preserve cultural heritage tourism. Due to the advancement of information and communication technologies, studies have shown an emphasis on promoting tourism using various digital platforms. Some of the platforms that have been studied were videos, motion graphics, websites, and social media (Muslimin, Cahyadi, & Aswar, 2018; Rosianta & Sabri, 2018; Salim & Som, 2018; Foronda-Robles, Mondelli, & Carboni, 2020; Permana & Sucipta, 2020; and Yonanda & Usman, 2021). These studies highlight the notion of visual design and development in promoting their respective local tourist destinations. The visual elements are beneficial in portraying the highlights of tourist attractions. Moreover, these studies also had similar aims to introduce the tourist destination to the public and increase the number of visiting tourists.

Preserving cultural heritage has been the commitment of UNESCO (Wiktor-Mach, 2019). While the UNESCO World Heritage Convention and Cultural Heritage Act No. 11/2010 states that everyone has the right to participate and enjoy freedom in the creation of cultural heritage, this has been a challenge in Indonesia as public participation in preserving cultural heritage is still lacking and highly dependent on the government (Lukman, Assilmi, & Imandiharja, 2019). Therefore, in line with the government's efforts to improve tourism to attract more visitors and increase the local community's welfare (Integrated and Sustainable Tourism Development Program (P3TB) Centre, 2021), this research attempted to contribute to this matter by digitizing cultural heritage tourism in the form of a collection of e-books through the implementation of project-based learning for the students of vocational higher education. Project-based learning was chosen as it provides students with a meaningful and authentic learning experience regarding cultural heritage promotion.

Studies have shown the linkage between project-based learning and tourism promotion. A study implemented a project-based learning model to improve the branding and promotion design of tourist destinations in West Java, Indonesia (Prawira, Johari, and Hikmatyar, 2021). The results showed that the project-based learning had strengthened the students' competence in the context of visual design. While their study focused on the students' perspectives in carrying out project-based learning, this study would focus on the process and products as a result of the project-based learning implementation on one of Indonesia's iconic cultural heritage sites, Borobudur Temple, whose areas cover twenty surrounding villages, which are still underexposed and whose potential is worth exploring. There is also the need to focus on the development of twenty villages surrounding the Borobudur area to support its community-based tourism (Sugiharti and Chaiechi, 2020).

Borobudur temple as a UNESCO's world heritage and Indonesia's priority tourist destination has vast potential due to its historical, natural, and cultural attractions. However, this potential still requires more exploration, particularly regarding the community villages surrounding the Borobudur area. A number of studies have put efforts into developing the village areas surrounding Borobudur temple and their promotion strategies as cultural heritage (Diarta, 2017; Arintoko, Ahmad, Gunawan, & Supadi, 2020; Prajanti, Sutanto, Prayitno, Ngatindriatun, & Mareta, 2020; and Sari, Rahardjo, & Wirawati, 2020). These studies used the approach of SWOT (strength, weakness, opportunities, and threats) to identify the potential strategies to promote tourism and offer development plans. The findings suggest the urgency to create online publicity, conduct digital promotion, and build a strong brand so that the community in the surrounding villages of the Borobudur area can be recognized widely. The studies have also agreed that these efforts are ways to preserve the diverse potential owned by the villages and to empower the local community to grow their economy through cultural heritage tourism.

However, despite its importance and urgency, the previous studies still offered concepts and ideas. Meanwhile, this study aimed to conduct applied research to digitize the cultural heritage potential through a project-based learning model. Digitization refers to the process of conversion of objects to digital forms, while the technology of digitization includes hardware, software, and networks serving the creation, content, or context of an image as digital assets (Sotirova, Peneva, Ivanov, Doneva, & Dobрева, 2012). In other words, using digital technology allows for the creation and publication of works in a digital environment, which allows them to reach a wider audience.

Furthermore, the government has paid little attention to this potential in accordance with the pedagogical approach in a higher education context. Subsequently, based on the discussion, this research aimed to design and digitize the cultural heritage of twenty surrounding villages of the Borobudur area in the form of e-book products as a project-based learning activity for students in vocational higher education. Moreover, the lecturers conducted a collaboration with UNESCO, a local organization of the Indonesian Tangguh Innovation Association (InTI), and students at the Vocational School of IPB University. Hence, this study aimed to support UNESCO in visualizing good examples of sustainable tourism in World Heritage areas. Through this collaborative project-based learning, the researchers expect to contribute to the efforts of exploring and promoting the potential of local cultural heritage so that the target villages can gain more recognition and exposure to society.

2. Method

This research used a qualitative case study as the research design and explored the implementation of project-based learning and presented the results of cultural heritage digitization. Qualitative research can be used to explore and examine social issues involving emerging questions and procedures (Creswell, 2018, pp. 50–51). In addition, a case study is a design of inquiry that evaluates a case of a program, an activity, an event, a process, or a group of individuals to develop an in-depth analysis. Because case studies are context-specific and time-bound, the data was gathered over a period, i.e., from March 2022 to July 2022. The data sources were taken from observations and documentation of class activities. The observations covered the processes of the project-based learning being conducted consisting of lists of stages and activities, while the documentation consisted of students' repositories as evidence of their work progress and results of the project. The data were analyzed inductively, elaborated in detail, and interpreted accordingly. A group of 127 second-year students from the College of Vocational Studies IPB University who study in the discipline of "Management Informatics" and enrolled in the "Graphic Design" course carried out the project work and designed the cultural heritage digitization of Borobudur and surrounding villages as e-books.

This case study conducted multi-actor collaboration through the partnership of the UNESCO Cultural Unit in Jakarta and Bogor Agricultural University, Indonesia. This is essential as collaboration is beneficial as a tool to address issues in developing a sustainable tourism (Liburd, Duedahl, & Heape, 2020). Moreover, future studies are still needed to broaden the praxis of how collaboration can be conducted in a practical situation (Perkins, Khoo-Lattimore, & Arcodia, 2020). This is in line with the Indonesian context as the National Research Master Plan for 2017–2045 demands multi-actor alignment and cooperation, namely the cooperation of government and non-government actors, including the private sector, universities, and civil society (Indonesian Academy of Sciences, 2017). In addition to the notion of collaboration, digitization is able to preserve the sustainability of cultural heritage (Aghaei, Sahebi, & Kordheydari, 2021). Therefore, there is a potential to explore the importance of collaboration in promoting tourist destinations while bringing the potential of tourism into the digital space.

For the collaborative project-based learning, the researchers established a partnership with the UNESCO Culture Unit of Jakarta and a local organization of the Indonesian Tangguh Innovation Association (InTI). Their roles were to provide data on the historical, natural, and cultural heritage of the twenty villages surrounding Borobudur as supporting sources in the students' digitization of cultural heritage. Figure 1 illustrates the overview of research stages in conducting collaborative project-based learning. There were three main stages, starting from the preliminary research conducted by the partners, followed by the project-based learning conducted by the students, and finished with the evaluation of the results. However, this paper limits its discussion to the process of implementing project-based learning; hence, the last stage is excluded.

3. Results and Discussion

In 2021, UNESCO Jakarta and Borobudur Conservation Center launched a book entitled *Mapping the Potentials of Borobudur Area* (Nurcahyadi, 2021). The mission is to support Borobudur temple tourism and increase the economic activity of the local community surrounding Borobudur area. The composing process involved twenty villages and their administrative managements under the supervision of Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. In addition, the local organization of the Indonesian Tangguh Innovation Association (InTI) helped gather basic survey of the situation and needs for capacity building for sustainable tourism by targeting twenty villages in Borobudur area, as well as provide photographs of the villages. Through the mapping of Borobudur area's potentials, it is expected that the local community can grow more sense of ownership of the natural and cultural heritage, gain more recognition, and be able to protect and preserve the heritage of the villages, particularly in the post-pandemic situation. Subsequently, through the partnership with UNESCO Cultural Unit in Jakarta and Indonesian Tangguh Innovation Association (InTI), Vocational School of College of Bogor Agricultural University Indonesia was given access and permission to utilize the mapping of Borobudur area potential to be designed and digitized to promote the cultural heritage of surrounding villages of Borobudur area through the implementation of project-based learning in Graphic Design course for the Informatics Management study program.

This study explored the process of project-based learning implementation to promote the cultural heritage tourism of Borobudur area in collaboration with UNESCO. This study also aimed to contribute and support UNESCO's recent program to promote a sustainable tourism approach in one of Indonesia's main World Heritage destinations, namely Borobudur. In terms of the collaboration, the specific objective is to identify and update the profile of the cultural potential of the twenty villages, especially related to their cultural heritage that can be used as a means of village promotion in the future. Hence, this study took a role in digitizing this so that it can be easily accessed to introduce these local villages whose potential is still considered as hidden gems. The discussion is divided into two parts: the first one covers the first research question i.e., to demonstrate the implementation of project-based learning for students of vocational higher education to promote cultural heritage tourism, while the second one discusses the designs of e-books as tourism information media to promote the cultural heritage tourism of twenty villages surrounding the Borobudur area.

3.1. Implementation of Project-based Learning

Project-based learning is evidenced to support students' performance in preparing them to solve real-world issues. Hence, to equip learners with the essential skills to face the future workplace, this study developed a project-based learning model to enhance students' learning experience in contributing to tourism promotion of cultural heritage in local villages surrounding Indonesia's iconic tourist destination, Borobudur. By integrating the course of Graphic Design

and another content knowledge of tourism, the project-based learning was implemented to design and digitize the cultural heritage of twenty villages surrounding Borobudur area. In discussing the process of the project-based learning implementation, this study referred to the principles of project-based learning proposed by SEAMEO Regional Centre for Quality Improvement of Teachers and Education Personnel (QITEP) in Language (SEAQIL) in 2020 as shown in table 1. Table 1 demonstrates the stages conducted and their relevance to the principles of project-based learning. Further descriptions are presented in the following sub-chapters.

Table 1: Project stages and principles of project-based learning (SEAQIL, 2020)

Stage	Activity	Project-based learning principles
Pre-Production	Brainstorming with partners	Challenging problem or question
	Conducting mini target audience research	Sustained inquiry
	Collecting visual assets and village profiles	
Production	Making design concept and creative strategies	Authenticity Student voice and choice
	Planning content and drafting	
	Designing and digitizing the prototype	
Post Production	Presenting the work	Principle of public product
	Evaluating the work	Critique and revision
	Revising the work	

3.1.1. Pre-Production Stage

Firstly, the pre-production stage covered three activities, i.e., brainstorming with partners, conducting mini target audience research, and collecting assets and village profiles. The brainstorming session was carried out to break down the goals of the project and its structured planning so that students were well-informed about the project planning. There were two goals of this project-based learning to be achieved, i.e., informative and persuasive. The students were expected to be informative in presenting digital information for the audience regarding tourist attractions as well as persuasive in inviting the audience to experience the diverse cultural and natural potentials of the twenty villages surrounding the Borobudur area. This initial activity is relevant to the principle of challenging problems or questions (SEAQIL, 2020).

Facing challenging issues may stimulate students to discover solutions or answers, including what tools to be prepared and what steps to be taken to achieve the goal. The main goal was to find ways to promote the tourism of surrounding villages in the Borobudur area through cultural heritage digitization. Hence, in this project-based learning, students were given several driving questions to lead them, such as: they had to examine the current situation of the target villages through document research and identify their target audience through interviewing respondents. The questions drove students to be focused on finding relevant information and activating their schemata as they dealt with the issue. This leads to the second activity, conducting mini target audience research.

To sharpen students' analytical thinking and research skills, they were asked to conduct a mini-target audience research to support the survey data collected by InTI. In realizing this, students were asked to interview two respondents of their choice. Forty people were

interviewed regarding their opinion, knowledge, and experience of any of the local villages surrounding the Borobudur area. It is revealed in the students' repository that the respondents' ages ranged from 17 to 22. Hence, the respondents were Generation Z who are natives of various digital formats. The results of this initial stage are shown in figure 2.

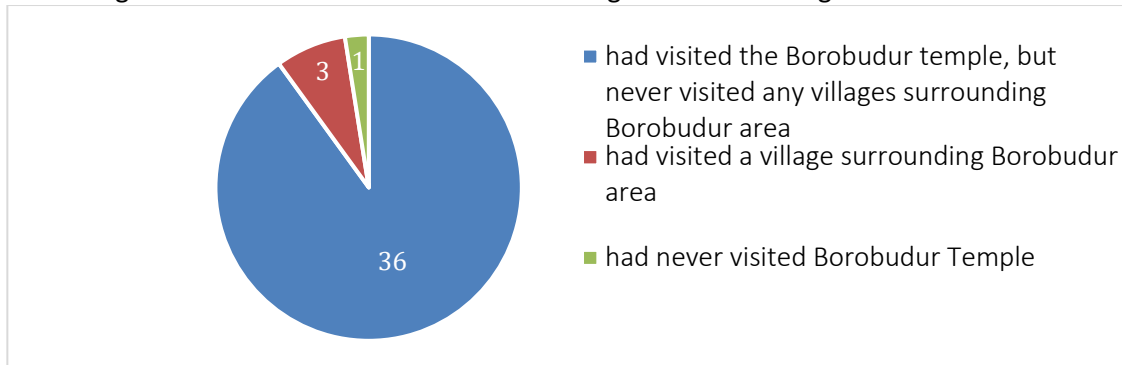


Figure 1. Target audience research conducted by the students

Figure 2 illustrates the dominance of respondents who had never visited or known any local villages surrounding Borobudur area, while 3 respondents claimed that they had visited a village surrounding Borobudur area, and 1 respondent stated that they had never been to Borobudur temple. This is in line with the preliminary research conducted by InTI in which they revealed that out of one hundred visitors of Borobudur, 80% of the visitors focus on visiting the Borobudur Temple and not visiting or aware of the surrounding villages. In addition, five respondents argued that the perception that they had of visiting villages is negative as it is identical with nature, traditions; hence, it was less likely to be a fun trip to explore the surroundings of the Borobudur temple. They all also agreed that the information regarding the local villages surrounding the Borobudur temple was still lacking causing them to be lacking recognition as well and much less well-known compared to the Borobudur temple. Subsequently, this activity allowed students to grasp the importance of the project through their own discovery. This is also relevant with the principle of sustained inquiry in project-based learning (SEAQIL, 2020) in which students engage in a continuous inquiry process that stimulates their critical thinking skills. Moreover, in the process of solving the problem, they generate knowledge and understandings that remain with them and that they can use again in the future.

The last activity in the pre-production stage was collecting visual assets and village profiles. This project serves as a further development of the book "Mapping the Potential of the Borobudur Area", published by UNESCO Jakarta in collaboration with the Ministry of Education, Culture, Research, and Technology, and the Oriental Cultural Heritage Sites Protection Alliance (OCHSPA). Hence, students processed the data of cultural heritage mapping to be digitized into e-book products. The visual assets were also from the collaboration with the Indonesian Tangguh Innovation Association (InTI), who provided students with photographs of the villages. Furthermore, the students were also encouraged to do their own research to collect data about the assigned villages. A previous study faced problems in designing tourism information media due to the limited availability of information related to tourism objects (Rosianta and Sabri, 2018). Hence, this study managed to overcome this issue through collaboration with UNESCO and InTI.

To sum up the first stage of project-based learning, the activities are in line with the basic principles of multimedia design and development field (Staylor, 2011). The blueprint stage refers to the pre-production stage which consists of two activities: discussing strategies and project planning, and conducting an analysis of goals, audience, and subject matter. The first one is like brainstorming ideas, while the latter is like target audience research and data collection. Therefore, it can be inferred that the steps taken in this project-based learning

reflected the basic principles of multimedia design, as the main objective of this study was to digitize the cultural heritage of potential tourist attractions in twenty villages surrounding the Borobudur area.

3.1.2. Production Stage

In the production stage, three activities were conducted, i.e., making design concepts and creative strategies; planning content and drafting, and designing and digitizing the prototype. This stage relied on students’ creativity as well as their hard-skill demonstrations in using the software tools, including Adobe Photoshop, Adobe Illustrator, and Adobe InDesign. As a learner-centered method, students played major roles in conducting the project, while the lecturers functioned as advisors to monitor the progress. The students started by making the design concept and creative strategies in the form of word documents consisting of the main message, concepts, taglines, and references to visual design.

In designing tourism promotion media, determining design concepts, ideas, themes, and taglines is very important in the design process (Utler, Husain, & Alimuddin, 2018). Hence, the groups had to create design plans and consult them with the lecturers. The main goals in digitizing the cultural heritage of the villages were informing and persuading. The products serve as a source of information regarding the villages and as promotional tools to attract an audience. Hence, the concepts proposed by the twenty groups were varied. The concepts of nature, art, culture, local, historical, and creative were used either separately or in combination. These concepts determine the overall themes of the design of the products. Following this, the students started to use the design tools in making the draft of the design. Before finalizing, the students were given feedback and revised the work. Table 1 shows the samples of cover designs, the colour palette, and the descriptions in accordance with elements of designs (Samara, 2020). Two cover designs were presented to demonstrate the design process in the production stage which took the theme, colors, and illustration into consideration to represent the overall theme of each village.

Table 2. Samples of cover designs, color palettes, and descriptions

Cover design	Main color palette	Description
		<p>The cover design uses an illustration of traditional games as the specialties of the Bumiharjo village. The color palette includes yellow and brown colors. According to Samara’s elements of design (2020), the yellow color is associated with the sun and its warmth. The color also represents a sense of contentment, which is also in line with the main theme of this village, playing traditional games. Meanwhile, the brown color is associated with earth and wood and represents a sense of comfort and safety. In addition, it also signifies the sense of timelessness,</p>

which shows how the traditional games have been preserved until today.



The cover design includes illustrations of a character and a view of the countryside. The cover highlights the natural attraction of Kenalan village. The character signifies an inviting gesture, as the aim of the e-book is to persuade the audience to visit the village. Moreover, the colour palette consists of blue and green. In accordance with Samara's elements of design (2020), the blue colour is associated with a sense of safety and protection and represents the sky, as depicted in the cover design. Meanwhile, green is the most relaxing colour in the spectrum and is associated with nature and vegetation, creating a sense of feeling safe. This shows that the village offers comfort and safety in its tourism.

The activities in the production stage were in line with the principles of authenticity and student's voice and choice (SEAQIL, 2020). There are three main points in the principle of authenticity; firstly, when the students were planning the concept and design, they referred to the real-life context, as the local villages that they contributed to were real. They also knew that the current situations were captured from the preceding activities; hence, they knew that the context of this project was authentic. Secondly, students also performed activities like their real life, such as graphic designing, which is relevant to their discipline; and thirdly, the project results should have an impact, i.e., in this case, their work would be used to promote the tourism of local villages. This could have an impact on the local communities as well as potential tourists to get knowledge of the cultural heritage of those villages

Furthermore, the principle of student voice and choice is also reflected in the activities in the production stage. It requires students to express ideas and make decisions while working on the project. They were given freedom in preparing the creative concepts and strategies since the lecturers only monitored the progress. In addition, project-based learning assists students to develop their content knowledge and collaboration skills to work as a team, which is crucial in their future career, and develops their autonomy to be initiative-taking in their own learning process (Aznar & Pizarro, 2020).

3.1.3. Post-Production Stage

The post-production stage consisted of three activities, i.e., presenting, evaluating, and revising the works. After finishing the prototype, the students were ready to present their work to the audience. Hence, this is in line with the principle of public product. Project-based learning allows students the opportunity to present their project results in front of a larger audience. Students gain satisfaction and motivation to present their work by presenting the project results. As a result, while working on the project, students must decide how the product will be presented to the public by demonstrating their understanding and proficiency in the software tools Adobe Photoshop, Adobe Illustrator, and Adobe InDesign, which they learned through

mentoring throughout the project. Moving to the last two activities of evaluating and revising, they are in line with the last principle of critique and revision in project-based learning (SEAQIL, 2020). In this context, the evaluation was performed by a panel of lecturers from the informatics management and ecotourism departments and representatives of UNESCO cultural units, with the total of forty-six evaluators. During the presentation of the prototype, students were also given feedback and suggestions to improve the prototypes before they were published to the public

3.2. Cultural heritage digitization of villages surrounding the Borobudur area

In addition to the implementation of project-based learning, this study also focused on the importance of cultural heritage to be maintained and promoted so that it can be widely recognized and benefit the local community. Borobudur Temple has been a UNESCO’s world heritage site for at least two decades. However, as it captivates the interests of both domestic and international tourists, the villages surrounding the area of Borobudur have not been exposed despite their vast potential in nature, culture, arts, and history. Subsequently, to support the program of mapping the potential of the Borobudur area (UNESCO, 2021), this study reported the digitized products of the potential of the twenty villages surrounding the Borobudur area to promote their tourism. This research is in line with a previous study whose findings showed that students were able to project the promotional designs through visual communication design (Aulia, Darmawan, Wahyuni, and Christine, 2022). Visual communication design is believed to be able to promote tourist objects and destinations by influencing tourists’ decision-making through images and proper storytelling (Dionyssopoulou, Pridezi, & Mylonakis, 2013). This would offer potential tourists with reliable information about their intended destinations through suitable designs.



Figure 2. Village potentials of Borobudur area (Baixinho, et al., 2021)

Figure 2 demonstrates five aspects of the potential of twenty villages surrounding the Borobudur area that were digitized by the students as part of project-based learning. The potentials include arts and cultural events, local commodities, natural attractions, rituals and traditions, and hall of village community. These findings are like the previous study revealing the strategies of village tourism development that emphasizes the local community (Arintoko, Ahmad, Gunawan, & Supadi, 2020). The strategies are the diverse traditional arts and culture; the beauty of nature in the hills and farm fields; the facilities of the Village Economic Center; crafts and souvenirs; and diverse traditional food and snacks. Hence, this study could contribute to the existing study by including the traditions and rituals in its discussion. The results can be used to create values for various tourist destinations and would be a step towards industrial and

community welfare. Subsequently, the following subsections present the samples of the prototype made by the students.



Figure 3. Arts and cultural events

Figure 3 shows the Topeng Ireng dance as one of the most common traditional dances within the area of Borobudur. The dance is the embodiment of a martial art called Pencak Silat and Islamic teaching practice. Another traditional art that can be enjoyed in the villages is Kuda Lumping. Tourists may experience the combination of traditional and modern arts, such as modern angklung, a musical instrument. These traditional performance arts must always be preserved so that they can be passed onto future generations. Moreover, there are also diverse cultural events, including cultural parades as a form of celebration. Hence, this depiction shows how the prototype product can introduce the cultural heritage of the twenty villages surrounding Borobudur.



Figure 4. Local commodity

Figure 4 illustrates a sample illustration of one of the village's local commodities. The majority of the villages has bamboo craft as the main local commodity in the Borobudur area. The community produces various goods and items from bamboo materials. Moreover, wooden crafts and earthenware are also found in the villages. The community is able to create wooden musical instruments, baskets, furniture, and children's toys. These productions are sold to be souvenirs for tourists. The villages also offer the hand-on experience for visitors in producing some of the traditional items. Some of the villages also have other kinds of commodities, such as cultivations of honey bees, oyster mushrooms, and plantations of various kinds of fruits and herbs. Therefore, by promoting the potential of these 20 villages, the community's economy is expected to be improved.



Figure 5. Natural attractions

Figure 5 demonstrates one of the village’s natural attractions, i.e., the Progo River, described as wide, clean, and clear. The activity offered is exploring the river using a raft. In addition, the villages surrounding the Borobudur area also have hill ranges, plantations, lakes, and other eco-cultural tourism where tourists can enjoy scenery and experience thrilling adventures, such as hiking, trekking, off-road riding, rafting, and many others. Waterfall sites are also the iconic natural attraction spots in the Borobudur area. Highlighting the potential of natural attractions in the villages could inform the audience with selections of outdoor activities to experience when visiting the villages.



Figure 6. Rituals and traditions

Figure 6 shows the ritual held by the villages’ communities on an annual basis, called Saparan Merti Desa. The ritual is held as an embodiment of gratitude towards God. The series of activities include Bersih Desa, Kenduri, charity, arts festivals, and a Wayang Kulit (leather puppet) performance. In Figure 8, the people carried Tumpeng, a cone-shaped woven bamboo container of traditional dishes and performed a parade. Another common ritual promoted in seven villages is the Nyadran ceremony, where the community visits, maintains, and prays at the tombs of their ancestors. This is important to enlighten the audience on how the rituals and traditions should be preserved for the sustainability of their cultural heritage.



Figure 7. Hall of the village communities

Figure 7 presents the hall of the village community, also known as Balkondes. Balkondes is a program proposed by the state-owned corporation, or BUMN, as a tool to boost the local economy and commodities (UNESCO, 2021). Therefore, the village hall community offers a platform for local government and the community to develop the economic potential in the villages. The facilities provided by halls of the village communities include hotels and other kinds of accommodations, restaurants, creative home industries, and Balkonjazz, a jazz music performance that can be enjoyed. Moreover, each village hall has its own characteristics, so it provides a diverse experience for the visitors. This is one of the highlights to promote the potentials of the twenty villages surrounding Borobudur area.

4. Conclusion

As Borobudur Temple is one of the world heritage areas in Indonesia protected by UNESCO, it is critical to preserve its cultural heritage. Therefore, mapping the potential of its surrounding villages is necessary to preserve their diverse potential and to empower the locals to be more independent in terms of cultural and economic development. This can be demonstrated through the collaboration of multi-party and multi-sectoral actors. This research derived from the urgency to disseminate information and archive data from twenty villages surrounding the Borobudur area. The students of Informatics Management at the College of Vocational Studies of IPB University took a role in designing eBook products containing the data mapping of the villages.

The focus area of this research was on digital technology and tourism, where the use of information and digital technology contributes to helping the revival of the tourism sector. Hence, in conducting the project, the students relied on the software tools of Adobe Photoshop, Adobe Illustrator, and Adobe InDesign. Meanwhile, the first stage was pre-production to conduct research and document analysis to plan the digital prototype, the second was production. As the most essential stage, the students worked on the project starting from drafting, designing, and digitizing until it became a finalized design product. The last was post-production where the groups presented their works for the public, followed by a team of lecturers and UNESCO representatives to evaluate the project, and give feedback and relation.

Subsequently, it can be inferred that the importance of information dissemination and data archiving from each village is supported by visual and digital graphics. Moreover, in the field of education, this research could provide additional input for IPB University in innovative curriculum and learning, because this research was applied as a Project-Based Learning design through the concept of a real project involving UNESCO. The results related to designing arts and cultural heritage that were conducted and digitized, can support tourism in the targeted area as a driver of the local and national economy. The topic for the achievement target is expected to become a National Research Product in the form of e-books and their development, as a work of art and innovation in the creative economy that can support the preservation and protection of cultural values and local wisdom.

References

- Aghaei, M., Sahebi, A. G., & Kordheydari, R. (2021, April). Design and explain the pattern of destination brand value creation strategies in Iranian tourism industry. *Journal of Tourism Quarterly*, 3(2), 68-97.
- Arintoko, Ahmad, A. A., Gunawan, D. S., & Supadi. (2020). Community-Based Tourism Village Development Strategies: A Case of Borobudur Tourism Village Area, Indonesia. *GeoJournal of Tourism and Geosites*, 29(2), 398-413.
- Aznar, M., & Pizarro, R. (2020). PBL to foster employability and develop sustainability. 5th Virtual International Conference on Education, Innovation and ICT.

- Baixinho, A., Santos, C., Couto, G., Albergaria, I. S., Silva, L. S., Medeiros, P. D., & Simas, R. M. (2021). Islands and Sustainable Creative Tourism: A Conceptual. *Land*, 1302-1319. doi:<https://doi.org/10.3390/land10121302>
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Los Angeles: SAGE Publications.
- Dionysopoulou, P., Pridezi, A.-E., & Mylonakis, J. (2013, December). Visual Communication Management Technologies in Promoting Tourism Destinations. *International Journal of Management Technology*, 1(1), 1-16.
- Indonesian Academy of Sciences. (2017). *White Paper: Science, Technology and Higher Education towards Indonesia 2045*. Jakarta: Indonesian Academy of Sciences.
- Integrated and Sustainable Tourism Development Program (P3TB) Centre. (2021, February 16). Cultural Heritage and Sustainable Tourism. Retrieved from Indonesia Tourism Development Project: https://p3tb.pu.go.id/en/main/data_detail/124/196/71
- Liburd, J., Duedahl, E., & Heape, C. (2020). Co-designing tourism for sustainable development. *Journal of Sustainable Tourism*, 1-20. doi:10.1080/09669582.2020.1839473
- Lukman, A., Assilmi, G., & Imandiharja, I. N. (2019, July). Cultural Heritage Digitization in Indonesia: a New Perspective on Preserving Depok Colonial Heritage. *Scientific Journal of Archaeology and Cultural Studies*, 15(1), 15-24.
- Middleton, V. T., Fyall, A., Morgan, M., & Ranchhod, A. (2009). *Marketing in Travel and Tourism (Vol. 4)*. Burlington: Elsevier.
- Muslimin, I., Cahyadi, D., & Aswar. (2018). *Design of Visual Communications Promotion Tourism Regency of Polewali Mandar*. Arts and Design. Makassar: State University of Makassar.
- Nurchayadi, G. (2021, December 01). UNESCO dan Balai Konservasi Borobudur Luncurkan Buku Pemetaan Potensi Kawasan Borobudur. Retrieved July 2022, from Media Indonesia: <https://mediaindonesia.com/humaniora/450873/unesco-dan-balai-konservasi-borobudurluncurkan-buku-pemetaan-potensi-kawasan-borobudur>
- Perkins, R., Khoo-Lattimore, C., & Arcodia, C. (2020, May). Understanding the contribution of stakeholder collaboration towards regional destination branding: A systematic narrative literature review. *Journal of Hospitality and Tourism Management*, 43, 250-258.
- Prawira, N. G., Johari, A., & Hikmatyar, A. A. (2021). Implementation of Project Based Learning Model to Improve the Quality of Visual Communication Design Learning Through the Collaborative Program of Design Development and Branding Tourist Destinations in Kuningan Regency of West Java Province. *Advances in Social Science, Education and Humanities Research*, 519, 12-20.
- Rosianta, E., & Sabri, M. (2018, June). The Making of Promotional Video of Tourism in Rupert Island. *INOVISH Journal: Journal of Language and Innovation and English Language Teaching*, 3(1), 55-72.
- Samara, T. (2020). *Design Elements: Understanding the Rules and Knowing When to Break Them*. Beverly: Quarto Publishing Group.
- SEAQIL. (2020). *HOTS-Oriented Module: Project-Based Learning*. Jakarta: SEAMEO QITEP in Language.
- Sotirova, K., Peneva, J., Ivanov, S., Doneva, R., & Dobreva, M. (2012). Digitization of Cultural Heritage – Standards, Institutions, Initiatives. In K. Ivanova, M. Dobreva, P. Stanchev, & G. Totkov, *Access to Digital Cultural Heritage: Innovative Applications of Automated Metadata Generation*. Plovdiv, Bulgaria: Plovdiv University Publishing House.
- Staylor, J. (2011). *Basic Principles of Multimedia Design and Development*. San Diego: Staylor-Made Communications, Inc. Retrieved from Staylor-Made Communications, Inc.: <http://staylor-made.com/wp-content/uploads/2011/11/MultimediaPrinciples.pdf>
- Sugiharti, D., & Chaiechi, T. (2020). Community-Based Tourism in Villages Surrounding Borobudur Temple in Central Java and an Inclusive and a Sustainable Path to 2030

- Agenda. *New Perspectives on the Diversity of Hospitality, Tourism and Events: Proceedings of the 30th Annual Conference*. Auckland: Auckland University of Technology.
- UNESCO. (2021). *Mapping the Potential of the Borobudur Area*. Jakarta: Indonesian Ministry of Education and Culture.
- Utler, T. T., Husain, M. S., & Alimuddin. (2018). *Design of Tourism Promotion Media in Jayapura District Perancangan Media Promosi Pariwisata di Kabupaten Jayapura*. Arts and Design. Makassar: State University of Makassar.
- Wiktor-Mach, D. (2019). Cultural heritage and development: UNESCO's new paradigm in a changing geopolitical context. *Third World Quarterly*, 40(9).