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Knowledge transfer in preserving the Delanggu Rojolele local rice variety: a case study of becoming village designer in In-Herit course

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ABSTRACT

Sabrang village was once known for its one-of-a-kind rice variety, Rojolele Delanggu. Despite this cultural abundance, the communities are currently abandoning these villages because they are deemed uneconomically viable. This paper investigates the ways in which knowledge-sharing initiatives involving local governments, women farming associations that have historically led farming rituals, and students from diverse developing countries contribute to the restoration of the Rojolele rice planting pattern. The project invited 20 international students from various developing countries to participate in the In-Herit 2022 program. The program was launched to increase student and local interest in becoming village designers through a case study of the preservation of local Rojolele Delanggu rice in Sabrang Village. This activity was broken down into three sections: (1) learning from locals, (2) participatory learning and action, and (3) proposing ideas to locals. The outcomes of this three-day project were a mapping of opportunities, challenges, and resolutions pertaining to the Rojolele Delanggu preservation initiative. The majority of students were able to quickly fit in with the locals, apply PLA materials, and were paired with student mentors who knew about farming community development activities in Delanggu farming regions.

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1. Introduction

Global conditions are currently undergoing drastic social change as a result of modernization [1]. This condition encourages people to migrate to cities because the economic potential is perceived to be greater in cities than in villages [2]. According to data from the United Nations Department of Social Affairs, the percentage of the global population living in cities reached 55.3% in 2018, with an increasing trend, and is expected to reach 68.4% by 2050 [3]. Even in developed countries such as Japan, the rate of urbanization has plateaued at around 91.7%, implying that rural areas are becoming increasingly depopulated. It is predicted that 896 towns and villages in Japan will cease to exist by 2040 [4]. On the other hand, villages serve as an economic pillar for the country, harboring significant potential that can be explored [5]. This potential encompasses physical aspects like land, water, climate, livestock, and human resources, as well as non-physical elements such as mutual cooperation, village governance, and community institutions within the village [6]. Villages should be developed to attract both local and external communities in a sustainable manner using this potential [7]. Design culture is an important factor in design contexts and is strongly related to community-based design development [8].

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The definition of design is "creating the ideal form of human life, things used in daily life and extraordinary life, and planning and designing the many things we do for our lives every day" [9]. While culture is the general behavior or lifestyle that humans learn, share, and communicate in order to form a society, such as language, customs, morals, religion, and so on [10]. According to cultural relativism, each human group has its own culture, and each individual culture has its own values, with no distinction between high and low, superiority and inferiority [11]. Culture is the way of life that distinguishes a community, a dynamic whole that creates and is created by people, places, and practices [12]. Design culture, according to this definition, is a discipline within design science that focuses on designing [possibilities] for a good life with determination, dedication, sincerity, and kindness, with the goal of creating sustainable community development by analyzing tangible and intangible forms of culture in which different values apply [13].

In order to establish a village, it is necessary to adopt a participatory approach in which community members are encouraged to actively participate as designers and decision-makers in the development of their region [14]. In practice, nevertheless, local communities frequently fail to recognize their inherent potential due to their complacency with their immediate environment. Therefore, the participation of external entities, such as village designers, is crucial to facilitating village progress and fostering collaboration between local entities and external stakeholders [15]. Village designers must have facilitator qualities in terms of attitude, knowledge, and skills [16]. In addition, village designers must have an open mind, a high learning attitude, flexibility, positive thinking, appreciation others, the ability to communicate and mobilize, listening and negotiation skills. Village designers must be able to make local people the "main actor" in their development, as well as motivate and stimulate local people to participate in their activities [17]. Davidoff stated the importance of pluralism and advocacy in planning, particularly for the low-income community [18].

Davidoff (1965) argues that the scope of planning should include public interests, promote equality to all citizens [18]. Advocacy and plural planning can help the co-design process in three ways: First, it will provide the public with numerous options. Second, it will put public agencies in competition with other groups for political support. This will foster healthy competition, with each stakeholder improving their skills. Third, it will compel those who simply criticize the government to devise new strategies and generate better ideas. The importance of this advocacy planning is to counteract the top-down approach planning. The top-down approach is widely and primarily used because of its ability to provide early and high-level planning, which frequently fails to gain a significant understanding of the real issues [19].

A bottom-up approach, on the other hand, makes more sense because it allows the community to help planners develop and strengthen their base design, as they can address their own problems and aspirations better than professional actors. Through the In-Herit program, course activities are conducted in an effort to attract the interest of younger generations to become village designers. Sebelas Maret University and Airlangga University launched this program in 2017 with the goal of introducing local potential in Indonesia through locality-based themes. Activities were carried out in two locations, namely Surabaya, East Java Province, for activities to introduce traditional herbs, and Surakarta, Central Java Province, for activities focused on courses for the development of village communities. These activities are to reveal the enormous potential of villages in Indonesia, with a total quantity reaching 81,616 villages with their unique potentials [20].

Activities for 2022 In-Herit program focused on community development based on the Rojolele Delanggu local rice preservation program in Sabrang Village, which was initiated by the research team in 2020 and is being carried out collaboratively with internal stakeholders, namely the Sedyo Makmur Farmer Group Association (GAPOKTAN), the Klaten Regency Agriculture and Food Security Office, and the Sabrang Village Government, as well as international educational institution partners, namely Monash University Indonesia. As an outcome of a previous local potential mapping process that employed FGD in conjunction with GAPOKTAN Sedyo Makmur, indigenous rice was replanted in Rojolele Delanggu [21]. This rice is a type of local rice that is nationally famous for its flavor and quality. Ironically, this rice has

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been extinct since the 1990s due to the green revolution's emphasis on planting effectiveness and efficiency, as well as the problem of rice resistance to leafhoppers [22]. Those sold in the market as Rojolele are simply for marketing purposes for other types of rice. In support of local rice preservation, which sets apart rice farming in Delanggu from other regions, the Subang Rice Plant Research Center provided seed assistance for the replanting of Rojolele.

Foreign students studying at universities in Indonesia who are interested in studies related to rural community development are welcome to participate in In-Herit 2022 activities. The countries of origin of those who took part in In-Herit 2022 activities came from Africa, the Middle East, Central Asia, and Southeast Asia. This activity was also intensely carried out for three days, from July 20-22, 2022, during the pre-and post-harvest of Rojolele Delanggu rice. The purpose of this program is to implement a co-design approach between foreign students assisted by mentor students and local stakeholders in collecting potential problems and designing proposals of ideas that become input for the development of the local rice preservation area of Rojolele Delanggu in terms of environmental improvement, human resources, economy, creative programs, and cultural preservation. Through their involvement in this program, international students are expected to foster a greater inclination towards pursuing a career as a village designer, offer residents diverse perspectives on development concepts, and ultimately inspire and support local communities throughout the village development process.

2. Method

Activities in the village designers' course, as opposed to those conducted in the laboratory or classroom, take place in rural regions or other settings where designers organize community development initiatives [23]. Activities are carried out using an experiential learning (EL) approach, which encourages students to become a part of the local community and interact with it directly. EL is able to change and maintain individual abilities in a relatively long time [24]. This approach emphasizes the totality of the human learning process, where experience forms the foundation for four modes of learning: feeling, reflecting, thinking, and doing [25]. In this program, EL is implemented by starting with students involved in an experiencing activity together with farmers, applying soft skills both in familiarizing and understanding local culture, as well as internalizing local wisdom values such as social, environmental, and mythological based on rice farming culture, then reflecting on these experiences through discussions on potential and problem. In this approach, the role of the facilitator (in this program, the student mentor) is very important to create an effective learning environment [26].

By encouraging locals to articulate their concerns, ideas, and potential for improvement in the Rojolele Delanggu preservation area that they aspire to design, students who become village designers position themselves as learners and the locals as instructors. Consequently, a two-way forum is incorporated into the course activities to facilitate the co-design process. This contrasts with the conventional approach to design education, in which users are treated as passive objects, and the designer merely obtains information about them in the form of a report rather than engaging in the creative process of developing ideas and design concepts [27]. Students will be provided with booklets and will carry out three main activities as shown in Fig 1: (1) learning from the locals, namely orienting yourself, getting to know the environment, and getting to know the people and cultures, (2) participative learning and action, namely by applying Participatory Learning and Action (PLA) tools such as mapping and ideation process, as well as (3) Proposing ideas to the locals, by presenting design proposals and discussions with internal stakeholders.

PLA can be defined as tools to increase knowledge about an area condition and to plan, act, monitor, evaluate, reflect, and scale up community action [28]. A Focus Group Discussion (FGD) approach is utilized throughout the entire In-Herit process. For the mapping phase, resource mapping and transect walk are utilized as PLA tools. For the ideation phase, a spider web diagram is utilized. The transect walk is a method of collecting information on land-use/land-cover (LULC) features across villages [29]. This procedure is executed in conjunction with the resource mapping procedure along a predetermined route through rice fields. The KJ-Ho

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method is subsequently employed to classify the gathered potential and problem data. By employing this approach, the discovery outcomes are grouped together, and the shared elements from the extracted data are structured [30]. Spider diagram is a tool for organizing ideas through a visual framework that becomes a concept map in the design process [31]. In the ideation process, FGDs were carried out in creating a spider diagram, which later became the basis for producing a design concept.

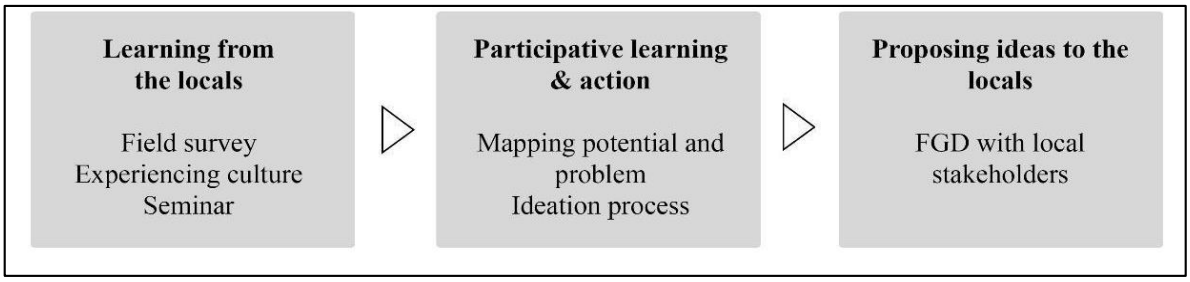

Fig 1. In-Herit course 2022 flow of activities

3. Results and Discussion

Based on the Rojolele Delanggu local rice preservation project, the 2022 In-Herit course activities were carried out in Sabrang Village with the goal of providing two-way benefits for students and local communities. The foreign students who participated in In-Herit came from Tanzania, Sudan, Pakistan, Afghanistan, Myanmar, Bangladesh, Yemen, and other countries where the overall status of the country is developing and has village and cultural potential to be developed, so it is hoped that this activity will increase their interest in village development in their respective countries. In order to facilitate the operation of the activity, participants were organized into five groups, each under the guidance of Sebelas Maret University (UNS) students who had previously engaged in community design activities for the Rojolele Delanggu local rice preservation program. In order to become a village designer, students must complete these three activities:

3.1. Learning from the locals

In order to achieve the status of village designer, it is critical that students establish themselves as village community members. In order to accomplish this objective, all conduct is maintained in a semi-formal fashion so as to foster an informal setting during the exchange between the two entities. For example, in the Sabrang village community, gatherings between residents and students generally adhere to the *wedangan* tradition. This entails the provision of traditional snacks and tea or coffee, as well as the utilisation of floor seating and an informal ambiance to foster an informal discussion process. As a result, any activity that involves a discussion, such as a seminar, is carried out using the *wedangan* format, as is experiencing culture. Communication is critical in this approach; some foreign students speak Indonesian fluently, while others are less fluent or cannot speak at all. As a result, the role of UNS students as activity facilitators is critical in connecting communication between foreign students and local communities.

3.1.1 Seminars by local and international speakers

As a venue for a briefing for students, knowledge exchange for local communities, and an adaptation process between local communities and students, the seminar was conducted in a Joglo, a traditional Javanese house that is still owned by farmers (refer to Fig. 2). The seminar format utilized the concept of *wedangan* and sitting on the floor to experience local culture. The explanation of the material in this activity is divided into two parts: an explanation of the potential by local stakeholders and an explanation of the theory and method of development by external stakeholders. Farmers and the Department of Agriculture and Food Security were encouraged to become resource people, with the assistance of local students, for language translation. Presentations given by local stakeholders focus on the local potential associated with Rojolele Delanggu rice farming, ranging from plants to locations to the culture formed.

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Fig 2. Seminar activities by farmers in the remaining traditional house

Researchers from Sebelas Maret University and Monash University Indonesia presented the material to external stakeholders. The materials discussed encompass various aspects of community development, such as the implementation of co-design methods, *Machizukuri*'s inter-community dialogue approach, which seeks to foster cooperation and community capacity among residents, and participatory design for social design by emphasizing social awareness considerations within the framework of participatory design. In addition, ecosystem services were mentioned in order to describe the advantages, including the provision of clean air and water, regulation of climate, and support for biodiversity. Furthermore, the discussion highlighted the importance of incorporating ecosystem services into community development plans to ensure sustainable and resilient communities.

3.1.2. Experiencing culture

Sharing cultural activities enables students to not only internalize values derived from indigenous knowledge but also become acquainted with local farmers through reciprocal communication and the exchange of expertise, thereby fostering an environment conducive to learning. A diverse range of cultural activities are available during the pre-harvest and harvest periods, including *wiwitan*. This ritualistic practice is performed in the afternoon of the day before the harvest as an expression of appreciation to *Dewi Sri*, the goddess of rice, for facilitating prosperous agricultural endeavors. Preparations for this activity begin in the morning with the arrangement of uborampe, or offerings, which include fruits, traditional snacks, vegetables, grilled chicken, and other items. This process is carried out in collaboration with students and farmer mothers under the supervision of Mbah Tanem, a senior remaining farmer who can perform *wiwitan* rituals.

The women farmers began the process of preparing the offerings by providing information about how to arrange and the meaning of each component. Furthermore, the activity was carried out by folding banana leaves to make the decorative elements of the offerings. The *uborampe* was transported from the residence of the farmer group leader to the ritual site in the rice field by a group of students and local farmers during the afternoon ritual (refer to Fig. 3). Mbah Tanem performed the ritual in the rice field by cutting several stems of Rojolele Delanggu rice and weaving a portion of the leaves to resemble the hair of a woman, who is considered a representation of Dewi Sri. Following this, "*Dewi Sri*" was transported to the farmer's residence, where she was given respite in a designated room while the farmers' mothers and students shared a meal of *sego wiwit* in the rice field vicinity.

The following day, after the *wiwitan* ritual, a traditional *ngani-ani*, or harvesting activity, is performed using a small iron knife with a bamboo and wooden handle (see Fig 3). Due to its perceived ineffectiveness and inefficiency, this traditional harvesting technique is now rarely employed. By collectively harvesting and selectively removing the ripe portions of the rice, this practice nevertheless embodies the local wisdom of previous farmers, including social values, perseverance, and ethical treatment of the plants. This approach differs from the existing method, which utilizes a sickle and fails to account for immature rice. This *ngani-ani* activity was launched by Klaten Regency Agriculture and Food Security Office representatives and was carried out collaboratively by local farmers and students.

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Fig 3. *Wiwitan* ritual and *ngani-ani* activities

After harvesting, rice straw is collected and used to create a variety of works, the first of which is the thatched roof of the hut (see Fig 4). The thatched roof is traditionally clipped onto bamboo and tied together with bamboo ropes. The thatched roof workshop was led by three remaining farmers who can still build thatched huts in the traditional manner. The huts constructed in this activity are authentic in design, with no nails used as a joint system. In this activity, students are encouraged to cut straw directly from newly harvested rice fields to make roof layers in groups.

Fig 4. Thatched roof hut workshop and games with Al-Hikam Kindergarten students

Another activity that involves experiencing the culture and interacting with the local community involves playing with Kindergarten-Al-Hikam students in Sabrang village. The activity was carried out by making straw buffalo puppets and racing them with cardboard boxes (see Fig 4). By incorporating environment-friendly natural materials, this exercise was additionally designed to heighten the kindergarteners' consciousness regarding motoric activities. This activity not only provided an opportunity for UNS students and village designers to engage with the local community but also allowed them to learn about the importance of sustainability and environmental awareness. The use of natural materials in creating the straw buffalo puppets served as a valuable lesson in promoting eco-friendly practices among kindergarteners.

Rojolele Delanggu rice is partly used for food culture activities after harvesting by cooking it into various culinary specialties using the rice's main material. This activity produces culinary delights such as *sego trancam* (Rojolele Delanggu rice with vegetables), *jenang katul* (porridge made from Rojolele Delanggu rice bran), and *lintingan katul* (snacks made from Rojolele Delanggu rice bran). Students learned how to make *takir*, (plate made from banana leaves) and *siru* (banana leaf spoons) in this activity. The students were also instructed on the construction of straws from rice straw and were given practical experience using straws that were historically employed by the children of farmers to extract water directly from the rice fields prior to the current fad towards eco-friendly straws (refer to Fig. 5). These traditional methods of using banana leaves and rice straws for eating and drinking utensils highlight the sustainable practices of the past. By learning these techniques, students not only gain practical skills but also develop an appreciation for eco-friendly alternatives in today's world.

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Fig 5. *Takir* and rice straw straw-making workshop

3.2. Mapping the opportunities and problems

Mapping was conducted in the rice field region through a direct survey approach under the guidance of local farmers in order to gather data on potential issues and challenges. Mapping activities were carried out directly in the committee's booklet, and the 2-way discussion process was carried out actively between students and farmers, facilitated by UNS student mentors. This process took one day to complete and covered the entire agricultural area of the Rojolele Delanggu local rice preservation area. Following direct observation in the field, the activity continued with each group transferring data to the board using post-it notes. Certain problems that can be categorized and grouped were classified using this mapping procedure, which was then followed by a confirmation procedure involving group members and documentation photographs (see Fig. 6).

Fig 6. Mapping and category creation

Based on the outcomes of category creation, all groups successfully identified a number of potentials, including those associated with culture, plants, animals, and hospitality. However, certain groups made more profound observations that revealed additional potentials, such as the scenery encompassing rice fields with a view of Mount Merapi Merbabu and the railroad tracks that run alongside the rice fields and people, specifically in terms of resilience and hospitality. There were also observations about village infrastructure, agricultural tools, and agricultural methods. In terms of mapping the problems, the results are far more diverse than the mapping of potential (see Table 1). Plastic waste strewn throughout the rice field region is cited as a problem shared by nearly all groups. Subsequently, a bridge repair temporarily halted water flow to the rice field region, resulting in an inadequate water supply. The scarcity of human resources, the lack of interest in agriculture among the younger generation, the ineffective and inefficient harvest process that causes a significant amount of rice to be wasted, and the absence of a massive marketing strategy to sell rice to the general public are all future mapping issues that must be resolved.

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Tabel 1. Map of potentials and problems

Group	Potentials	Problems
Group 1	Animals: mantis, dragonfly, snake Plants: Rojolele rice	A lack of adequate facilities to process and add value to their commodity A lack of market access with no price control
Group 2	Fruit: banana, little cherry Rice: Rojolele rice Tree: chinese petai Leaves: telang flower, alang-alang (grass), weed	There is a lot of trash in the rice fields because of the contaminated river water irrigation. The net used by farmers to protect their rice from birds is not reusable and is not disposed of. Instead of reusing rice straw waste, farmers burned it. There is no water on the rice field because the bridge is being demolished and a project is disrupting the irrigation source. There are numerous weeds that can disrupt the growth of Rojolele rice.
Group 3	Animals: snails, rat, birds, chicken, crab, swallows, dragonfly Plants: Rojolele rice, IR64 rice, banana, papaya, cassava, jackfruit Culture: rice culture, bamboo craft, banana leaves packaging Architecture: huts water channels, bamboo bridges	Pollution: plastic, air pollution (burning straw) Technological: lack of modern machineries Economic: No marketing for selling rice in large scale Safety: lack of safety equipment
Group 4	Architecture: traditional rice straw hut animals: small organisms and petty animals Intercropping approach which good for soil fertility and pest control People: local community has awesome trait of hospitality and openness towards foreigners, the resilience of the local community is the key driving force behind the preservation of rice Culture: there is a strong bond between the cultivational rice and cultural heritages Scenery: beautiful and attractive	Environmental problem: no sites designated for waste disposal, low knowledge on waste management strategies Productivity: Machinery area old and worn out, poor post-harvest handling practice, most of the rice lost to the ground Human resource: most of farmers are old with low energy, youth aren't interesting in farming due to the low income
Group 5	Animals: mantis, snails, egret, crab Plants: telang flower, cherry tree, wildflowers, banana, Rojolele rice Tools: tracing machine, ani-ani, fork to take out weed, rice sack, caping (farmers hat) Infrastructure: bamboo bridge, rice straw hut, bamboo signage, railway line, water channels Agriculture method: rice seed spacing, fertilizer from burned straw, planting period (6 months)	No water flows at this time (because of the renovation) Dying land (cracking) Plastic trash Chemical liquid to remove the unnecessary plants around paddy

3.3. Presentation for the proposed design

Following the mapping and problem category creation and consideration phases, the discussion progressed to the ideation phase. During this phase, participants generated a range of solutions that either addressed existing problems or explored potential avenues for improvement (see Table 2). FGDs and spider diagram brainstorming were used during the ideation process to identify potential development opportunities. The presentation activity was held on the final afternoon of the In-Herit course in a casual *wedangan* format, and all internal stakeholders were present to discuss the results. Internal stakeholders represented by the head of the farmer group, village head, and agriculture office representatives became judges to select the best group, while researchers were represented by researchers from Sebelas Maret University and Monash University Indonesia.

The researchers provided valuable insights and expertise during the selection process, and ensured that the judging criteria were fair and objective, based on both local knowledge and scientific research. Additionally, this collaborative approach fostered a sense of trust and credibility among all participants, further enhancing the overall effectiveness of the development opportunities identification process. The average group discussed development ideas within the scope of marketing Rojolele Delanggu rice, encouraging the younger generation to be interested in this local rice farming activity, improving technology in the postharvest process for effectiveness and efficiency, making integrated irrigation channels, and also good waste management for current environmental pollution solutions. Additional ideas emerged from the presentation, such as providing safety equipment and workshops and training related to self-importance for farmers, which had not previously been considered but is critical. Suggestions such as holding similar activities by inviting foreign students can also increase the motivation of residents in the surrounding area to attend and participate in the preservation program. The development of rice straw handicrafts is also a proposal to reduce rice straw burning, which causes air pollution and has an economic impact on local communities. Straw crafts have the potential to attract tourists who want to see how straw crafts are made.

Tabel 2. Development ideas from the groups

Group	Development Ideas
Group 1	Premium packaging of Rojolele Delanggu. Marketing strategy, government as farmers promoters. Empowering women in producing Rojolele Delanggu rice. In addition to the construction of silos in close proximity to their farms, the government provides modified seeds to farmers as an additional measure of support.
Group 2	Social media platforms (Instagram, Facebook, TikTok, and YouTube) inspire the younger generation; therefore, we should make use of this awareness. Efforts can be undertaken to increase awareness of this particular field. The government should provide support young generation by giving incentives. Local Community such as Karangtaruna should encourage the young people to work. Bring in more foreign students and tourists to participate in activities similar to In-Herit in order to inspire the locals. In addition to connecting rice fields to culture, the elderly should provide financial assistance to the younger farmers by remitting a substantial portion of their earnings.
Group 3	The elimination of intermediaries is achieved through the use of online media as a marketplace for rice sales. Use social media and technology-based programs to encourage younger generations to pursue careers in agriculture. Crafts and workshop activities utilizing rice straw as a material will delight visitors. Providing safety equipment for farmers. Knowledge regarding hygiene and self-importance requires workshops and training; the government can organize such an event.
Group 4	Introduction of modern water pipes to carry water from the water source (river) to the rice fields. Cleaning the plastic wastes and disposing them properly, and additionally local farmers should be trained on waste disposal and ecological value. Water channels should be properly designed to benefit the local community. Design and build local water storage point in the rice field. Giving farmers adequate training on post-harvest management, to boost their knowledge on the subject matter and enhance high productivity. Search for the new markets out of the region (Market potential, Business potential). Collaborating with other universities and community organizations, disseminate the agricultural knowledge. Incorporate more appealing marketing strategies, including celebrity endorsements, food vlogging, and advertising.
Group 5	Creating an efficient disposal system for plastic waste. Developing integrated irrigation channels connecting rice fields and water sources. Making organic fertilizer from rice field waste such as rice straw.

The viability of each proposal was evaluated after the five groups' presentations, and group three was found to be the most promising because all the components of the local Rojolele Delanggu rice preservation program desperately needed to be pursued. A farewell event was held at the end of the activity, which was attended by almost all of the villagers on the outskirts

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of the rice field area, as well as internal stakeholders (see Fig 7). The event provided an opportunity for the villagers and internal stakeholders to discuss the potential benefits and challenges of implementing the local Rojolele Delanggu rice preservation program. It also allowed for further collaboration and brainstorming on how to effectively pursue all the components of the program.

Fig 7. Idea presentation in front of stakeholders and farewell event for 2022 In-Herit

3.4. Discussion

The In-Herit Course 2022, which focuses on the conservation of Rojolele Delanggu rice, is intended to help international students learn the skills they need to become village designers and local actors strengthen their cultural and social ties to the region through participation in the program. Students successfully completed the 3-day course with the results of mapping potential, problems, and solutions that are varied and can be followed up on in the future for the Rojolele Delanggu preservation program. The critical thinking personality of the foreign student participants is evident in how actively they ask questions, express opinions, and propose village development ideas, which is crucial to being a good facilitator.

Student evaluations show that experiencing culture is the most popular activity because it is new, exciting, and practical with local communities. This demonstrates that culture can be a good thing if it is well packaged and involves local stakeholders as the lead activity. Furthermore, the involvement of local stakeholders not only enhances the cultural experience but also ensures that the activities are relevant and beneficial to the community. This approach promotes a sense of ownership and collaboration, leading to more sustainable and impactful village development initiatives.

In terms of students' level of understanding and adaptation to the local community, almost all of the 18 students can adapt quickly, owing to the ability to speak Indonesian as well as the character of the village community, which is open, kind, and humble towards foreigners (see Fig 8). Because of the welcoming atmosphere, some students felt at ease. Meanwhile, students who struggle with adaptation are more likely to have language issues. 17 students were able to carry out the learning well for the level of understanding of the mapping process because they analyzed the potential and problems from a close perspective directly in the field and together with farmers (see Fig 8).

The process's interactive method was also very practical and simple to use. The issue was more about the students' unfamiliarity with the mapping process, which they had never done before. The majority of students understand the ideation process (see Fig 8). In addition, the seminar materials are implementable for this process, and the assistance from UNS student mentors is very useful. In this regard, it was discovered that the most obstacles encountered by students were due to limited data sources and limited time. From the entire series of activities, all students (20 students) expressed an interest in the possibility of becoming village designers in the future. Several reasons include a motive of humanity and empathy for the village community, a desire to change the village where the student lives through local potential, and the passion of students who want to collaborate with the community and blend in with the culture.

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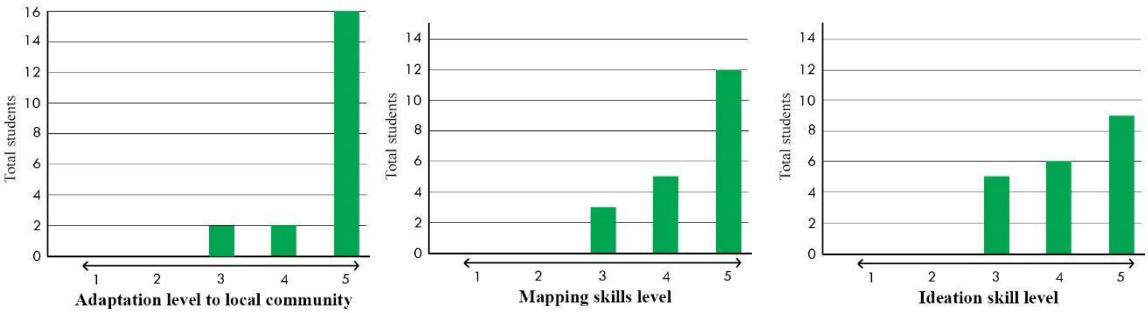

Fig 8. Students' understanding level

From the perspective of local stakeholders, the presence of foreign students can have an impact on the spirit to organize similar activities as part of the Rojolele Delanggu preservation program. There are several important points that will be followed up on in the future by designing a more concrete program to be implemented based on the ideas obtained from the idea proposal. Various things that were previously unnoticed by local stakeholders became important notes from the proposed ideas, such as the need for farmer safety and health workshops and training. This activity also marked the beginning of a positive trend, as current local stakeholders began to recognize the value of local Rojolele Delanggu rice as a village asset. The In-Herit activity increased cohesiveness among local stakeholders to collaborate toward the same goal. This was not discovered prior to the implementation of In-Herit activities, when activities were more routine and top-down in nature. Another positive outcome was increased awareness of the potential of Rojolele Delanggu rice by the local village government, so that after the activity, the government immediately facilitated a rice field area of 5000 m^2 to be designed together into an eco-tourism based on the preservation of local Rojolele Delanggu rice.

4. Conclusion

Villages exert cultural, social, and economic influence. Due to the village's multifaceted potential, it can be constructed in a self-sufficient and sustainable manner if managed appropriately. Consequently, it is crucial that village designers serve as intermediaries or facilitators during the program design process, ensuring that internal stakeholders actively engage, and local potential is taken into account. Sabrang Village hosted the In-Herit 2022 program to increase community members' enthusiasm for pursuing a career as a village designer in the future. From this program, it is clear that students' critical and proactive dispositions are crucial for identifying potential issues and fostering community engagement in the process. Conversely, collaboration entails an authentic disposition originating from the village inhabitants. A convincing and gradual strategy, along with evidence of the success of micro or macro-scale initiatives, can achieve this objective. Collaboration and success in program organization increased local community participation in the in-Herit activity; this became a crucial pillar for the program's long-term viability. This program effectively enhanced students' consciousness regarding village development and fostered their burgeoning interest in pursuing a career as a village designers. Conversely, since all farmers in this program are at least 50 years old, it is difficult to collaborate with local youth because the vast majority of village youth have no interest in rice farming. Nonetheless, as foreign students engaged in rice farming in their village, the younger generation began to gradually recognize their own potential; thus, this will be a consideration in the future when designing In-Herit activities.

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Declarations

Author contribution : PP: research initiator, activity designer, analyzed the data and wrote the article, EP: conducted research experiment, analyzed the data, and wrote the article, GCH: conducted research experiment related to Rojolele rice plant, EWP: conducted research experiment related to natural material exploration.

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