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**Exploring the Nexus of Service Learning Initiatives and Quadruple Helix
Stakeholders in Malaysia**

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Abstract

This paper explores the dynamics of Service Learning Malaysia (SULAM) initiatives and their impact on quadruple helix stakeholders. A qualitative approach involved interviews with 11 lecturers and 16 community participants and thematic analysis to understand how SULAM initiatives impact the stakeholders within the SULAM ecosystem. Findings indicated that the nexus of service-learning initiatives and the stakeholders includes five main themes: University-Industry Collaboration, Government-Academia Partnership, Community Engagement and Empowerment, Skill Development and Human Capital, and Socio-economic Impact. The findings also highlighted the importance of equal partnership among stakeholders to ensure the sustainability of SULAM initiatives.

Keywords: Service learning; quadruple helix; community impact; community environment

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1.0 Introduction

As a pedagogical approach, service learning enhances students' academic learning by integrating experiential learning with community service, which addresses specific community needs and includes deep reflective practices (Bringle & Hatcher, 1995). This approach improves attitudes towards learning, cultivates civic-mindedness and career-related skills (Celio et al., 2011; Prentice & Garcia, 2000; Eyster, 2002), and increases academic performance in addition to promoting social and personal development through improved social-emotional processes (Simons & Cleary, 2006). Beyond just students, faculty, community partners, and universities also gain from this approach, which also improves organizational capacity and academic curriculum and offers possibilities for professional development (Mohd Naufal et al., 2024; Nikolova & Andersen, 2017; Cronley et al., 2015; Yontz & McCook, 2003).

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In Malaysia, service-learning has been embedded into higher education curricula through high-impact education practices (HIEPS) initiatives since 2015. The service-learning implementation in Malaysia underwent branding as Service Learning Malaysia: University for Society (SULAM) in 2019, encouraging collaboration among quadrupole helix stakeholders (Fig. 1): academic institutions, local governments, industries, and communities to benefit all parties. Quadrupole helix stakeholders' collaboration in service-learning implementation is expected to promote social innovation through the interaction of these four sectors and ensure the educational impact is socially relevant and applicable to real-world situations.

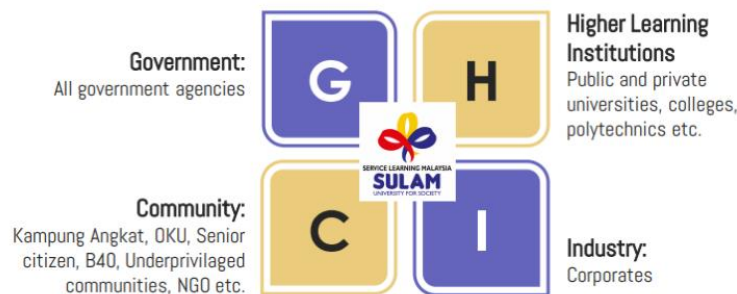


Fig. 1: SULAM quadrupole helix stakeholders in Malaysia

Although service-learning has been proven successful in enhancing student learning experience and achievement (Salam et al., 2019), more is needed to know how it affects other quadrupole helix stakeholders. Thus, this study investigated the nexus of service-learning initiatives and quadrupole helix stakeholders in Malaysia. Specifically, this paper aims to study the impacts of SULAM initiatives and their perceived benefits for the university, communities, agencies, and industries.

2.0 Literature Review

2.1 Service-Learning

Service learning is a pedagogical approach that aims to improve student's learning of an accredited course in their academic program by integrating structured experiential learning opportunities through service activity that meets identified community needs and deep reflection of their service experience (Bringle & Hatcher, 1995, p. 112). Service learning enriches students' academic learning and promotes personal and social development through social-emotional processes (Simons & Cleary, 2006). Participation in service-learning programs also significantly improves students' academic performance, personal and interpersonal skills, attitudes toward learning, and civic-mindedness (Celio et al., 2011). Additionally, service learning offers students valuable opportunities for career discovery (Prentice & Garcia, 2000) and the acquisition of complex problem-solving and social skills through continuous reflection on their service experience (Eyler, 2002).

Apart from students, the benefits of service learning to other stakeholders, explicitly involving community partners, faculty, and the university, are widely acknowledged (Nikolova & Andersen, 2017). Service-learning programs generally enable community partners to expand their organizational capacity, contribute to society capacity building through mentoring students, and acquire new knowledge (Cronley et al. 2015). For example, service-learning initiatives by nursing students benefit community partners in terms of enhanced knowledge of social determinants of health, better appreciation of the role of community nursing, and increased access to health care (Schneider et al., 2018). Service learning also benefits the faculty and university, especially regarding access to new teaching tools (Prentice & Garcia, 2000), enhanced curriculum, professional development for academia, and collaboration opportunities (Yontz & McCook, 2003).

The implementation of service learning in higher education has been formalized in Malaysia at the national level since 2015 as a part of high-impact educational practices in the curriculum. An ideal Service Learning Malaysia: University for Society (SULAM) model involves quadrupole collaboration among university, community, government bodies, and industry. Many studies have focused on the impact of service learning on the achievement of students' learning outcomes and soft skills development (Salam et al., 2019). At the same time, minimal in-depth studies were published regarding the simultaneous impact of service-learning initiatives on various stakeholders involved within the quadruple helix collaboration, including universities (students, lecturers, and faculty), community partners, agencies, and industries, especially in the Asian context. Understanding the nexus between service learning and Quadruple Helix stakeholders is essential to facilitate the development of practical framework and policy for impactful and sustainable SULAM initiatives.

2.2 Quadruple Helix Collaboration in Service Learning

The Quadruple Helix model highlights the value of interactions between universities, industries, government, and communities in promoting innovation and working together to overcome complex societal issues. By including these four necessary parties, this model broadens the breadth of educational impact in the service-learning context and guarantees that learning experiences are intellectually stimulating, socially relevant, and directly applicable to real-world situations (Nordberg et al., 2020). Integrating this model into service-

learning initiatives such as SULAM enables a holistic approach to education that fosters students' civic responsibility, critical thinking, and problem-solving abilities while concurrently attending to specific community needs.

Research has indicated that service-learning initiatives designed using the Quadruple Helix framework considerably improve community empowerment and involvement, producing results for sustainable development (Mohd Naufal et al., 2024). Such partnerships, for example, have been demonstrated to strengthen ties between academic institutions and the local socio-economic environment, enhance infrastructure, and give community members helpful work skills. Moreover, universities can improve the relevance of their curricula (Yontz & McCook, 2003) and give students a rare chance to obtain practical experience in their fields of study by involving staff and students in projects that call for active collaboration with businesses and governmental organizations. This will increase the employability and practical skills of the students (Salam et al., 2019).

2.3 Impact of Service Learning on Quadruple Helix Stakeholders

Service learning directly involves students with community issues, leading to greater community engagement and empowerment. This alignment helps bridge the gap between theoretical knowledge and practical community challenges, allowing for a more integrated approach to addressing local needs (Sunarti et al., 2023). It enriches the community's role within the Quadruple Helix, ensuring that innovation and development projects are responsive to real-world contexts. Meanwhile, academic institutions can enhance their curriculum and provide students with hands-on experiences that foster a deeper understanding of their fields of study (Kaumba, 2023 & Bellandi et al., 2021). This experiential learning supports the academia arm of the helix by creating more relevant research opportunities and applying academic theories to solve practical problems, thus fostering innovation. Service-learning projects often require coordination with government entities, especially when addressing societal and environmental issues. This interaction can lead to better-aligned policies that support educational and community development initiatives, promoting more efficient and effective governance.

Overall, service learning can dynamically enhance the functionality of the Quadruple Helix model by fostering closer ties and more meaningful collaborations among the four-helix components. This leads to more holistic and sustainable approaches to innovation and problem-solving, benefiting not just the participants but also the broader society.

3.0 Methodology

This study employed a qualitative instrumental case study approach to explore the nexus of service-learning initiatives and Quadruple Helix stakeholders in Malaysia. Data was collected over 11 months, from September 2022 to August 2023, through in-person, semi-structured interviews. Protocols were created in collaboration with the Malaysian National SULAM Strategic Committee and pilot-tested for clarity. Participants were purposively sampled to ensure representation from diverse regions of Malaysia. The study was conducted across three selected regions: South Peninsular, East Peninsular, and Borneo regions of Malaysia. The study involved two groups of participants: 16 community representatives and 11 lecturers. These individuals were selected as critical informants due to their direct involvement and significant roles in implementing service-learning projects within their communities and universities. The interviews lasted between 80 and 120 minutes, were audio recorded, and included comprehensive notes. Thematic coding was employed to thoroughly and systematically examine the data. The study was approved ethically, and all participants gave their informed consent after being reassured of their privacy and the voluntary nature of their involvement.

4.0 Findings

The findings indicate that the nexus of service-learning initiatives and quadruple helix stakeholders encompasses five main themes: University-Industry Collaboration, Government-Academia Partnership, Community Engagement and Empowerment, Skill Development and Human Capital, and Socio-economic Impact, as summarized in Fig. 2.



Fig. 2 The nexus of SULAM initiatives and quadruple helix stakeholders (government, higher learning institutions, industry, and community)

4.1 University-Industry Collaboration

SULAM initiatives have significantly fostered collaboration between universities and industry partners. These partnerships are aligned with the corporate social responsibility (CSR) objectives of industries, encouraging financial and logistical support while promoting sustainable university-industry relationships. Table 1 summarizes some contexts of how university-industry collaborations in SULAM

implementation promote dual benefits for industries and universities, encourage innovation, and address community issues. The findings highlight the impact of the SULAM initiative in fostering collaboration between universities and industry partners. The right match of SULAM initiatives with industry corporate social responsibility (CSR) objectives encourages industries to provide financial support and catalyzes continuous and sustainable university-industry partnerships. At the same time, the lecturer noted the importance of the visibility of SULAM initiatives in attracting industry involvement.

'If we do (SULAM) engagement involving school (for example), involve the media. The media accelerates the promotion of our work (to attract industry partners)' (University E, Lecturer Y)

Interview findings from the present study indicate that the SULAM project has not only provided a means for industry to realize its social purpose but also opened opportunities for universities, with the help of industry, to test their innovation in solving community issues.

'The community came to us to help them develop an innovative program as they participated in an inter-community competition. So, we developed a GIS (Geographic Information System) database that is related to information about the community itself. They won second place in that state-level competition.' (University S, Lecturer S1 and S2)

Table 1: Perceived impact of university-industry collaboration to quadruple stakeholders in SULAM initiatives

SULAM Context	Perceived Impact	Example of Quotes from Participants
Mangrove Preservation Project (University S) Companies funded mangrove planting which was carried out by students through SULAM project.	<ul style="list-style-type: none"> University: Enhanced students' learning experience. Industry: Achieved their CSR objectives. Community: Preserved mangroves in their community. 	<i>"Many of our mangrove projects were sponsored by companies through their corporate CSR initiatives. They have financial resources yet lack the manpower to execute the tree planting efforts"</i> (University S, Lecturer 1 and 2).
Public Preschool Learning Space (University B) An oil and gas company funded a project to redesign a preschool learning space with an industry-specific theme.	<ul style="list-style-type: none"> University: Contribute lecturers' and students' expertise. Industry: Achieved their CSR objectives. Community: Enhanced learning space for preschool children. 	<i>Lecturer's Perspective: "If we have a linkage with any industry interested in doing CSR, we can match the project to our SULAM initiatives"</i> (University B, Lecturer B).
Plastic Waste Education Programme (University E): Industry and government grants have supported long-term environmental education projects.	<ul style="list-style-type: none"> University: Enhanced students' learning experience, university received project funding and recognition of their expertise by industry. Industry: Good branding Community: Increased environmental awareness. 	<i>"We have collaborated with Agency A using various grants to conduct programs on plastic pollution projects"</i> (University E, Lecturer X).

4.2 Government-Academia Partnership

Government-academia partnerships are pivotal in SULAM projects, enhancing local development through knowledge sharing and resource allocation. Additionally, partnerships with government agencies enhance the reputation of involved higher learning institutions and provide sustained support for community development. For example, the government-academia partnership can be seen clearly in the case of the University S' SULAM tourism project with the island community (Table 2). Rather than allowing abandoned historical buildings on the island to rot, the university has collaborated with one of the agencies under the Ministry of Rural and Regional Development and the village community to execute the historical site tourism project. The collaboration between University S, the agency, and the local district office resulted in a concerted effort to develop the island. Previously, these government agencies contributed to the island's infrastructure, but with University S in the picture, new knowledge was gained.

Interview findings also showed that most community participants agreed that SULAM initiatives have positively impacted the community partners and enhanced the reputation of the university and government agencies involved. Examples of community response are:

'What we have seen so far is there is an impact on the community from the programs brought by the University S.' (Community S, Participant 3)

'University S, government agencies, and NGOs have given so much (knowledge) to us... It is up to us to execute them.' (Community S, Participant 4)

This finding is supported by a previous study that noted that government-university partnerships through service learning initiatives enhance the positive images of universities and government agencies involved and support their role as agents for social change (Latib et al., 2017). Another noteworthy finding from this study pertains to the engagement of government agencies in SULAM initiatives based on the university's track record. For example, funding was given to University B after it effectively provided clean water to a rural school using its budget.

'The success of this project prompted the government to allocate funds for similar rural water treatment projects in 11 schools situated in rural and remote areas within the state.'(University B, Lecturer X)

Funders, including government agencies and industries, now emphasize accountability for community impact from collaborative projects with universities to make informed decisions on funding priorities (Peacock et al., 2020).

Table 2: Perceived impact of government-academia partnerships on quadrupole stakeholders in SULAM initiatives

SULAM Context	Perceived Impact	Examples of Quotes from Participants
<p>Tourism Project (University S)</p> <p>Collaboration with the Ministry of Rural and Regional Development and local communities to develop eco-tourism and historical site preservation.</p>	<ul style="list-style-type: none"> University: Enhanced students' learning experience and recognition of expertise by agencies. Government: Achieved their agenda/purpose. Community: Improved socio-economic status. 	<p>"60-70% of the villagers are fishermen, so their income is unstable. So, we try to develop (our economy) via eco-tourism. The agency has donated two boats for tourism. University S, on the other hand, has provided us with ideas and suggestions for promoting local attractions. For example, one of the professors has turned abandoned stalls into a gallery showcasing the island's history for public viewing. They helped us to develop several galleries on the island exhibiting the heritage of the local jongs and mangrove trees. There is also an educational center for schools." (Community S, Participant 1)</p>
<p>Skill Development Workshops (University S)</p> <p>Women's Organizations contribute to community skill-building, enhancing local income generation.</p>	<ul style="list-style-type: none"> University: Contribute lecturers' and students' expertise. Government: Achieved their agenda/purpose. Community: Enhanced knowledge and skills. 	<p>"Agencies have come to teach beauty techniques like make-up and massage for extra income" (Community S, Participant 2).</p>

4.3 Community Engagement and Empowerment

Through the engagement of community stakeholders, service-learning initiatives stimulate communities' empowerment to take on local concerns. For instance, in the University S SULAM project with one of the communities on mangrove preservation, the community partner has been empowered to be one of the main players in mangrove preservation, at the same time generating income for the community.

'The community here is now the main supplier of mangrove seedlings to Selangor and Perak. Although these two states have several conservation projects, they do not have mangrove seedlings. The demand is high, so they do not have sufficient manpower to collect them. Thus, they look forward to the university team to come and help them.' (University S, Lecturer 1 and 2)

In a different SULAM initiative on environmental advocacy programs at schools by University E and composting programs at University S, community participants expressed their sense of engagement and empowerment through these programs. In the case of SULAM programs that fail to sustain, the community expressed their intention to improve their approach and revive the program at their initiatives.

'We can make compost fertilizer from food waste and eggshells. It is fun because we now know how to make it (the fertilizer) and can bring our stuff and do it with friends in a group.' (Community E, Participant 4)

'University S brought several programs to the island, including making compost fertilizer and mushroom cultivation. However, this did not last long. Perhaps we need to find ways to revive the programs as they can be a means to increase income for the villagers.' (Community S, Participants 6)

4.4 Skill Development and Human Capital

The findings indicate that SULAM programs facilitate significant skill development and human capital enhancement for both students and community members through co-learning.

'The (primary school) students liked learning from the University East students as they learned a lot of new things. They enjoyed the rewards received as a means of attraction in participating in nature-loving activities. They are also fast learners and could produce better results by adding color and beads to make the products look more attractive. We can tell they understand what was delivered as they could answer the quiz questions we gave them.' (University E, Lecturer P3)

'We shared with them (the community) methods to make soap from waste cooking oil. Some of them brought the materials home and did (soap-making) with their families... We informed them (the community) during the SULAM engagement the other day, "You can open (and sell online) at Shopee. If it looks nice, you can upload it here"...it can be sold because they already know. (While for the university students), they acquire communication skills and lifelong learning, and (enhance) their personal and soft skills.' (University E, Lecturer Z)

4.5 Socio-economic Impact

Collaboration between service-learning initiatives and Quadruple Helix stakeholders can generate positive socio-economic impacts on the community through improved capacity for service, achieved goals and values, and acquisition of new knowledge and insights (Lau & Snell, 2020). Findings indicated that SULAM initiatives by University B on digital inclusivity with villagers in rural areas and eco-tourism projects by University S have resulted in a tangible socio-economic impact.

'Since 2017, we have learned (more about business) how to take photos of our products and promote them. We now have several successful entrepreneurs who previously did not own a shop but now have their factories and business licenses. Some have turned to social media to sell their products.' (Community B2, participant B1)

'Apart from the statistics we gathered, we observed the lifestyle changes (of the community participants)... There is a lady who used to drive an old van. She is the only one with a van in the village, but hers was very old with (plastic) chairs like the one you can find in a shop. When University S came, she was requested to provide transportation service for the service learning students. During one of the van trips, we told her it was hot and wished someone was selling drinks. She realized the business opportunity and started selling drinks. A few villagers started their homestay business using vacant rooms in their houses to cater to the demand for accommodation from outsiders.' (University S, Lecturer 1 and 2)

5.0 Discussion

The benefits of SULAM initiatives extend beyond immediate educational outcomes (Salam et al., 2019). The study reveals that SULAM initiatives foster sustainable university-industry collaborations, enabling companies to fulfill their social responsibilities while supporting students' academic goals (Tables 1 and 2). The involvement of industries in projects such as mangrove preservation and public preschool redesign demonstrates the potential for these partnerships to drive innovation and address community needs. These findings suggest that universities should align their SULAM projects with industry CSR objectives to attract more industry support and subsequently enhance the impact and reach of their SULAM initiatives. On a different note, although our participants have yet to mention the aspects learned by students through industry involvement in their SULAM initiatives, industry-university partnerships can help students develop more holistic perspectives on how funding is managed in a project (Smith et al., 2018).

The study also highlights the importance of symbiotic relationships in government-academia collaborations to ensure SULAM initiatives bring more value to communities, particularly in projects aimed at local development, such as eco-tourism and skill development workshops (refer to Section 4.2). These partnerships enhance the effectiveness of service-learning initiatives by combining government resources with academic expertise. Thus, the government should support SULAM initiatives with favorable policies and funding to enhance social and economic development. At the same time, educational institutions should engage with government agencies to align these projects with national priorities.

SULAM initiatives empower communities by involving them directly in addressing local concerns. Projects such as mangrove preservation and environmental advocacy programs demonstrate how community members can become active participants in sustainable development efforts (refer to Table 1). At the same time, co-learning between students and community partners during service-learning programs benefits both parties regarding skill development and human capital (refer to Section 4.4). Benefits to students include enhancement of academic performance, personal and interpersonal skills, attitudes towards learning, and civic-mindedness (Celio et al., 2011), career exploration (Prentice & Garcia, 2000), and acquisition of complex problem-solving skills (Eyler, 2002). For the community, studies showed that service-learning supports the capacity building of rural youth and adults, hence improving community capacity and recognition (Hennes et al., 2013). According to Mtawa (2019), service-learning develops skills and human capital for community partners through empowerment, participation, and sustainability of the initiatives. Considering the above benefits, higher learning institutions should emphasize integrating skill development components in their SULAM projects to enhance students' employability and improve community members' capacity to address local issues.

This study also indicates that SULAM initiatives have demonstrated tangible socio-economic impacts on communities, particularly in digital inclusivity and eco-tourism areas. These projects have improved business skills, increased income, and enhanced community resilience (refer to Section 4.5). It is suggested that models of successful SULAM projects can be replicated in other communities with similar contexts.

Finally, the SULAM ecosystem fosters a culture of mutual benefit and collaborative learning, enhancing education, fostering innovation, and building networks. It also promotes sustainability and long-term impact, with ongoing programs benefiting the community and stakeholders and continuous engagement opportunities for universities, industries, and government agencies.

6.0 Conclusion & Recommendations

The SULAM initiatives in Malaysia have proven highly beneficial to many stakeholders, significantly improving corporate involvement, governmental efficacy, and community development. These initiatives increase economic prospects, promote significant educational results, and enable significant contributions to the environment and society. SULAM activities address immediate local needs and promote long-term sustainability and resilience within these ecosystems by involving communities, agencies, and enterprises in cooperative projects. The effectiveness of these initiatives emphasizes how crucial integrated educational strategies are for tackling complex societal issues.

The Quadruple Helix collaborations should be expanded to include diverse community sectors and industries, enhancing resource sharing among universities, industries, and government bodies. Community involvement should be increased, and a robust monitoring framework should be implemented to track long-term impacts on community development, policy formation, and industry practices.

Policymakers and educational institutions should support service-learning initiatives through favorable policies and dedicated funding, recognizing the social value created by these initiatives.

This study is limited by its focus on specific regions in Malaysia, which may not fully represent the diversity of contexts in which SULAM initiatives are implemented. Additionally, while providing in-depth insights, the qualitative approach may need to capture the broader quantitative impacts of these initiatives.

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Paper Contribution to Related Field of Study

This paper contributes to the community environment field by highlighting the significance of collaborative efforts in addressing challenges in various dimensions of the community environment.

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