The Need for Interdisciplinary Programs at the Postgraduate Levels: A Study of the Saturation of Existing Study Programs

Bambang Yulianto[1] Sueb[2*] Harmanto[3] Hasan Subekti[4] Prima Vidya Asteria[1]
Ika D C Arifah[5] and Puspita S Sukardani[6]

[1] Indonesian Language Education Program, Universitas Negeri Surabaya, Surabaya, Indonesia
[2] English Language Education Program, Universitas Negeri Surabaya, Surabaya, Indonesia
[3] Civic Education Program, Universitas Negeri Surabaya, Surabaya 60231, Indonesia
[4] Science Education Program, Universitas Negeri Surabaya, Surabaya 60231, Indonesia
[5] Digital Business Program, Universitas Negeri Surabaya, Surabaya 60231, Indonesia
[6] Communication Science Program, Universitas Negeri Surabaya, Surabaya 60231, Indonesia
sueb@unesa.ac.id

Abstract. In recent years, the landscape of higher education has undergone significant transformation due to advancements in knowledge, technology, and globalization. In the context of developing countries, there have been rapid expansions of interdisciplinary programs at higher education levels, with a growing emphasis on postgraduate education. However, many of these countries continue to rely heavily on monodisciplinary study programs, which can lead to a saturation of knowledge and skills within specific disciplines. This semi-qualitative study aims to explore the emerging need for interdisciplinary postgraduate programs in developing countries, considering the limitations of traditional existing programs, and the potential benefits that interdisciplinary approaches can offer. Through primary data analysis, there are inseparable aspects to be considered to propose more sustainable programs, i.e. market demand, public interests, cross-disciplinary, curriculum design, collaboration, and sustainability. Some potential sectors to be proposed include cross-sector programs, i.e. data science and public health, sustainable programs (economics, environment, and social studies), digital media psychology, biomedical and regenerative medicine, global business and intercultural communication, and artificial intelligence (AI) based programs.

Keywords: Interdisciplinary Programs, Market Demand, Future Study Programs, Sustainable Programs

1 Introduction

This research aims to explore the emerging trend for interdisciplinary programs, especially postgraduate programs level, in the context of developing countries [1]. The trend is based on the limitations of existing traditional monodisciplinary programs and the potential benefits that interdisciplinary approaches can offer. In recent years, the landscape of higher education has undergone significant transformation due to

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advancements in technology, science, knowledge, and globalization. Developing countries, in particular, have experienced a rapid expansion of higher education, with a growing emphasis on postgraduate education for human resource development. However, many of developing countries, like Indonesia, continue to rely heavily on typical monodisciplinary study programs [2], which can lead to a saturation of knowledge and skills within specific disciplines and unmatched competence [3] with the market demand.

Monodisciplinary study programs have been the core of most of the higher education institutions for decades. These programs, ranging from bachelor to doctoral levels, focus on in-depth training within a single academic discipline, fostering expertise, and specialization. Despite such programs have contributed significant role in building a strong foundation of knowledge, they often result in a narrow perspective. This might lead to limited graduates' skills to overcome complex challenges and they lack the ability to connect interdisciplinary subjects to their own more narrowly defined fields of expertise [4]. As the number of graduates from these monodisciplinary programs increases, they become oversaturated which cause intense competition for limited job opportunities within their fields. Statistic shows that one of six graduate got their first job after one year, yet it does not match, or only partially matches, the qualifications they have acquired [5].

Monodisciplinary study programs may not adequately prepare graduates for the multidimensional challenges of our interconnected world [6]. Creating interdisciplinary education in such settings demands skills [7] that we define as the art of managing interstitially. Many of today's societal and global issues, such as climate change [8], healthcare services, urbanization and gentrification, and technology advancement [9], are mostly interdisciplinary. Addressing these challenges requires professionals who can bridge the gaps between different disciplines, integrating diverse perspectives to develop innovative and comprehensive solutions. Monodisciplinary programs can inadvertently discourage collaboration, hindering the development of these crucial skills.

Interdisciplinary postgraduate programs offer a holistic approach that encourages collaboration [10], creativity, and adaptability. The need for interdisciplinary research education programs to embed the development of student' interdisciplinary research skills [11]and attitudes within their research projects is highlighted and prepare students for an increasingly interdisciplinary [12], collaborative, and global job market. By bringing scholars and students from various disciplines, cross-disciplinary programs foster a rich learning environment where diverse viewpoints converge and enable students to develop a broader understanding of complex issues, allowing them to synthesize knowledge from multiple sources and apply it to practical scenarios. Studies has proven that graduates of interdisciplinary programs are better equipped to navigate the multifaceted challenges of the modern world [13].

Developing countries are positioned to establish interdisciplinary postgraduate programs to address both local and global challenges [14]. These nations often struggle with a range of complex issues, such as sustainable development [15], health crises, economic disparity [16], and environmental issues. Interdisciplinary programs are expected to provide students with the skills to understand the interconnected challenges and develop contextualized solutions.

In the context of developing countries, where the existing higher education landscape is dominated by monodisciplinary programs, there is a need to establish interdisciplinary postgraduate education. The limitations of traditional monodisciplinary approaches, coupled with the increasingly complex challenges of the modern world, call for a shift towards programs that foster interdisciplinary collaboration, critical thinking, and holistic problem-solving. This study aims to propose the importance to establish the interdisciplinary programs for postgraduate level by looking at the current trend of proposal of the new programs.

2 Methods

This study aims to analyze the saturation and sustainability of cross-disciplinary study programs as part of the academic program development strategy at one public university in Surabaya. The research method used is qualitative research to analyze the saturation and sustainability of the study program is content analysis. This study used data sources in the form of primary data on graduation (tracer studies), existing study programs, and study program proposals obtained through literature reviews and interviews with educational experts (undergraduate level, postgraduate levels, satellite campuses, and professional education and certification).

Data collection was carried out through literature studies and interviews with educational experts. The data obtained was then processed and analyzed using content analysis. The analysis process begins with data transcription and then coding the data using predetermined analysis codes. Content analysis was carried out by looking for patterns in the data related to the saturation and sustainability of the study program. Content analysis is carried out by identifying the main themes that appear in the data and mapping the interrelationships between these themes. Descriptive analysis was used to facilitate data processing and content analysis, as well as to help identify emerging patterns and themes in the data.

3 Results and Discussion

This section discusses the findings of the study which covers the strategy to analyze the saturation of the existing study programs and potential interdisciplinary programs for academic development.

3.1 Study Program Saturation and Sustainability Analysis

Analysis of saturation and sustainability of study programs is an evaluation process carried out to assess the extent to which existing study programs in higher education institutions are relevant to respond to the needs and demands of society, industry, and other stakeholders in a sustainable manner. This analysis process usually involves monitoring the performance of the study program from time to time to ensure that the study program remains relevant and in accordance with developments in the surrounding

environment, including the relevance based on the users and tracer studies to the alumni. The premise for such evaluation is that a program study can always be evaluated and modified over time [17]

One analysis method can be used as a tool for analyzing saturation and sustainability in proposing new study programs in tertiary institutions is through SWOT analysis. This method helps to identify the strengths, weaknesses, opportunities, and threats associated with the existing study programs and new study programs to be proposed. This method is more often used in the context of business development, but can also be used to carry out internal and external evaluations to propose new study programs, especially across disciplines.

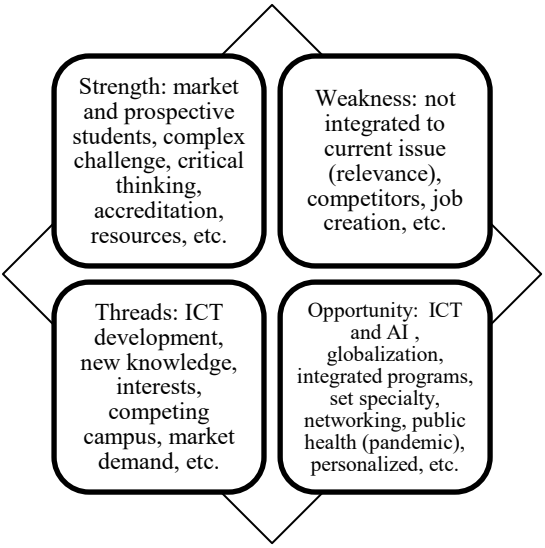

Fig. 1. The SWOT Analysis chart, which is commonly used for business development, can be used as an academic program development.

By taking into account the strengths, weaknesses, opportunities and threats associated with the proposed new study program, it helps ensure the saturation and sustainability of the existing and proposed new courses or study programs. One of the main reasons for the saturation of study programs is because the number of graduates is too large compared to the needs of the job market (job creation and market-driven condition) based on the tracer studies. There are other reasons why some study programs in Indonesia are experiencing saturation. Some of these reasons include:

Interests. Even though the study programs gain high interests from the prospective students, but in fact it causes too many graduates compared to the demand in the job market. In this situation, there is an anomaly that traps the universities that just because a study program is of interest to many prospective students, it does not mean that the

study program has good prospects or has good sustainability after graduating from the programs [18].

Market-driven Decision. Study programs are not connected to the needs of the labor market so that graduates of these study programs experience low uptake or find it difficult to get jobs in accordance with their field of study (job creation). When the study program is unable to equip prospective graduates with the skills needed by the market, graduates do not have competitive qualifications compared to job requirements; in other words, the role of the study program is considered nil [19], tracer studies show the lack job creation lower the interests of the prospective students, making the study programs are not sustainable.

Integrated Studies. The area of expertise of the study program is not up to date with the times and the world of work and fast advancement of information, computer, and technology (ICT), causing some study programs that are not updated to experience saturation because the curriculum and learning methods are not in accordance with current needs and demands. The emerging artificial intelligence (AI) has shifted the future paradigm in science development and relevance with future demand; those who are not embraced with the vast development of technology and AI-based curriculum, the sustainability is likely to be threatened and even replaced.

By understanding the causes of the saturation of a study program, it can be proposed several steps that need to be taken so that the study program meets the needs of the labor market and the curriculum is updated according to the times. The SWOT analysis mechanism is not only used to propose new study programs, but also to measure the level of saturation and sustainability of existing study programs. As with the model used in Academic Services at the University of Ottawa (Canada), there are three steps that need to be taken to adjust the study program's curriculum policies so that they do not experience saturation. Some of the units involved are alumni, alumni stakeholders or users, and quality assurance. As an effort to develop new cross-disciplinary study programs, it is necessary to analyze its saturation and sustainability for several reasons as follows:

1. Guarantee the quality of study programs by ensuring that the existing study programs at university are of good quality and remain relevant to the needs of society and the industrial world [20].
2. Determine the direction of study program development by analyzing the saturation and sustainability of study programs, tertiary institutions can determine which direction to take in the future study program development [21].
3. Measuring the effectiveness of the study program can help universities assess the effectiveness of existing study programs and improve ineffective study programs, both in terms of graduate absorption, funding management, and the sustainability of study programs [22];
4. Guarantee the sustainability of the study program by conducting a sustainability analysis, universities can ensure that existing study programs can survive in the long term and continue to provide benefits to society.

5. Strengthening the image of the university that helps universities to strengthen their image and reputation in the eyes of society and the industrial world.

It is necessary to design and propose new interdisciplinary programs at universities which offers a unique opportunity to address the emerging challenges, stay relevant in rapidly changing landscapes and ICT, and provide students with the (personalized) skills needed for success in an interconnected world. Higher education institutions should play their roles in connect and collaborate with several sectors, including industrial sectors, to initiate future programs. The urgency stems from the needs to equip the prospective graduates with multidisciplinary and complex skills to thrive in a complex, dynamic, and interconnected society [23].

Some required elements that should be included in opening new study programs at a university is a significant endeavor that requires careful planning and consideration, namely market demand and trends, student interest (personalized learning), the availability of faculty expertise, interdisciplinary and cross-sector approaches, integrated curriculum design, accreditation and regulations, and infrastructure. Opening a new study program requires collaboration among various stakeholders (users or industrial and business sectors), including faculty, administrators, and students/alumni. Thorough planning and attention to detail can help ensure the success and sustainability of the new program within the university's educational offerings.

3.2 Potential Interdisciplinary Academic Program Development

The urgency to open new interdisciplinary programs in tertiary institutions is driven by several factors. One of the main factors is the changing needs of society and the economy, which requires graduates with diverse skills and knowledge to tackle complex real-world problems [24]. The urgency of analyzing the saturation and sustainability of study programs is the importance of maintaining the quality and relevance of current and proposed study programs to the needs and demands of the surrounding environment. By conducting this analysis, universities can ensure that the study programs they have remain relevant and in accordance with developments in the surrounding environment and continue to provide benefits to society and the industrial world in the long term.

In Indonesia, the trend of cross-disciplinary postgraduate education is currently growing with many universities offering interdisciplinary study programs. This study program is usually designed to facilitate students who have multidisciplinary learning interests, gain knowledge, and expertise in various fields [25]. Here are a few potential future interdisciplinary study programs at universities, along with the rationale and hypothetical statistics to support their relevance:

Data Science and Public Health Informatics. The global pandemic has led to new perspectives to the importance of public health resilience. The programs in the area of data science and public health integrates data-based decision in relation to the public health in order to address complex health challenges in the future. Data-driven insights can enhance disease prevention, healthcare planning, and resource allocation. In several

studies, most of public health professionals expressed the need for advanced data analytics skills to optimize health interventions.

Environmental Economics and Sustainable Policy. The combination economics, digitalization, and environmental science equips graduates to develop sustainable development policies. Understanding economic implications of environmental decisions is crucial for global sustainability as to provide balance policy in economic-driven industrial sector and environmentally-based sustainable. The demand for professionals with the mindset of sustainable policy is projected to grow bigger in the next ten years [26]) .

Digital Media Psychology and User-Demand Design. Integrating psychology and design helps create digital experiences that are user-friendly by considering their behavior and emotions, enhancing engagement and well-being. Future trend tend to be personalized services, including media and learning. Studies indicate that user-centered design and other business can increase user engagement by 40%, leading to higher customer satisfaction [27]

Biomedical Engineering and Regenerative Medicine. Another shifted mindset due to global pandemic is the emerging trend of research in more advanced medication. By combining the biomedical engineering with regenerative medicine, future graduates are expected to develop technologies which create functional tissues and organs and revolutionize healthcare. The regenerative medicine market is predicted to grow significantly every year, indicating a strong demand for skilled professionals in the area of biomedical engineering [28].

Global Business and Intercultural Communication. Globalization and internationalization becomes inevitable paradigm in current and future community. Effective communication across cultures in borderless community is vital for business success. This program prepares students for international collaboration. Research has suggested that companies with culturally diverse teams are more likely to outperform their competitors, and this situation should be answered by universities too to provide a more open skill for their graduates.

Ethics in Artificial Intelligence and Digital Legal. The vast advancement of ICT and AI has led to several dilemmas in terms of the legal infringement and ethics. Addressing the ethical and legal aspects of AI is crucial. This program equips prospective students to develop solutions to the potential issues as the effect of the growth of AI-based trends while adhering to ethical and legal frameworks [29]. It is predicted that by 2025, the AI ethics market is projected to reach its peak, signaling the importance of ethical AI development.

These potential interdisciplinary programs are mostly to respond to the emerging societal needs, technological advancements, and shifting industry demands; the indicators to these issues have emerged in current lives as called as disruptive era. The hypothetical prediction for respective sectors is helpful to become reflection the growing

trends and demand for professionals with skills that bridge traditional disciplines. Creating such programs is believed to equip graduates with holistic perspectives yet with versatile skill sets, to ensure their readiness to face complex challenges.

4 Conclusion

As higher education has experienced remarkable transformations driven by knowledge advancement, technological innovations, and global interconnectedness. Despite these advancements, the prevalent reliance on monodisciplinary study programs persists, potentially leading to an oversaturation of knowledge and skills within specific fields. Several essential considerations have been identified as integral to the proposition of sustainable study programs at higher education levels. These aspects encompass market demand (job creation), public interests, cross-disciplinary integration, curriculum design, collaboration, and long-term viability. As exemplified by the proposed sectors, including cross-sector initiatives like data science and public health, sustainable programs spanning economics, environment, and social studies, as well as specialized fields such as digital media psychology, biomedical engineering, global business and intercultural communication, and artificial intelligence (AI), interdisciplinary approaches to the establishment of new programs hold the potential to reshape higher education.

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