International Journal of Learning, Teaching and Educational Research
Vol. 23, No. 5, pp. 21-40, May 2024
https://doi.org/10.26803/ijlter.23.5.2
Received Mar 11, 2024; Revised May 11, 2024; Accepted May 18, 2024

The Structural Model of Students' Sustainable Professional for Developing Indonesia's Higher Education Programs

Wanda Nugroho Yanuarto*, Ira Hapsari, Githa Fungie Galistiani, Akhmad Jazuli
Universitas Muhammadiyah Purwokerto, Indonesia

Elfis Suanto
Universitas Riau, Indonesia

Abstract. Higher education initiatives can contribute to the Sustainable Development Goals (SDG) by funding long-term learning programs that support students' personal, social, and professional development in the workplace. Therefore, this study aimed to investigate the role of sustainable professional as a dependent variable between sustainable social and personal aspects within higher education programs. The empirical study outlined sustainable professional, social, and personal development elements as well as measurement and structural models. The data were collected using a cross-sectional methodology. Subsequently, surveys were conducted and analyzed using the Analysis of Moment Structure (AMOS) 24.0 program. The samples included 754 students from three faculties at Universitas Muhammadiyah Purwokerto, Indonesia, specializing in teachers training and education, business and economics, and pharmacy. The results supported the hypothesis that autonomous personal training and sustainable social communication can improve students' professional learning. The urge to educate students could prompt teachers to engage in more professional activities. Therefore, even in a world where changes are both inevitable and impossible to predict, higher education programs can sustain or improve teachers' performances.

Keywords: higher education program; structural model; sustainable personal; sustainable professional; sustainable social

1. Introduction

The World Commission on Environment and Development is primarily responsible for sustainable development (Leal Filho, 2021). The Commission

*Corresponding author: Wanda Nugroho Yanuarto; wandanugrohoyanuarto@ump.ac.id

described sustainable development in its report as an approach that "meets the needs of the present without compromising the ability of future generations to meet personal needs". This definition represents a significant step forward for the cause of sustainable development. To ensure the current and future success of educational systems, sustainable development needs to prioritize the protection of natural regions and effectively utilize resources, particularly in education. (Adiatma, 2023; Desa et al., 2021).

Higher education can help achieve the SDGs by funding programs enjoyable to students while also fostering a fair inclusive, and harmonious workplace environment (Manni, 2023). Furthermore, the programs can perpetuate good learning practices and preserve the professional, personal, and social values necessary for continued development to meet current demands without sacrificing those of future generations (Conradty & Bogner, 2022). When discussing development, the term "sustainability professional" is commonly used to refer to higher education's efforts to educate students on how to be more efficient and effective in learning, make a positive impact on society, be more productive, think creatively and strategically, embrace sustainability in learning, and achieve high social and personal performance (Ghusa, 2021; Matekina et al., 2021). In higher education programs, sustainable personnel aims to attract, motivate, and retain capable students who can implement the policies and objectives of the learning process. To improve educational and social values, showcase innovation potential, and build brand equity, teachers should adopt more efficient strategies. This can be achieved by inspiring students to operate sustainably and fostering strong social connections (Eliaumra, 2021; Musyarofah, 2021).

The majority of higher education curricula prioritize helping students become more sustainable professionals (Camilleri, 2020; Krayneva et al., 2021). For instance, higher education in Oman has allocated funds for learning and development to maximize students' achievement. As part of this initiative, all students are required to attend various learning sessions, both formal and informal, organized by the university, external institutions, and learning bodies (Ningrum et al., 2021). According to Suherman et al. (2022), allocating 20% of the national budget to education remains a priority for the Indonesian government. A significant sum of GBP 34.7 million would be allocated to education in 2022 to support five key priorities, namely expanding access to education across all levels, improving the quality of education infrastructure (particularly in underdeveloped areas and remote islands), strengthening the connection between schools and the workforce, and generally improving education standard. In terms of higher education, the government is committed to increasing funding in various ways, including but not limited to expanding professional programs, promoting culture, fostering research and innovation, as well as strengthening world-class institutions. Therefore, investments in students' professional success enable firms to earn financial benefits and ensure the effectiveness of the SDGs (Parry & Metzger, 2023; Tejedor et al., 2022).

According to Novidsa et al. (2020), prioritizing social and personal goals alongside higher education objectives fosters resource-based sustainability among students.

For instance, it is wise and productive to encourage positive students behaviors such as growth, adaptability, dedication, and health. Sustainable personal learning is typically integrated into the educational programs, aiming to provide students with both cognitive and interpersonal skills, like social learning, empathy for others' values, welfare, and beliefs, as well as procedures, principles, ethics, leadership, and collaboration to help fulfill daily learning responsibilities (Fajar et al., 2021; Hamidah et al., 2023). Therefore, effective approaches to sustainable environment training in higher education organizations promote power delegation, where superiors delegate responsibility to subordinates for planning, managing, and monitoring training programs (Gunamantha, 2020).

Regardless of the type of higher education, sustainable personal training is essential. The ability of higher education to consistently foster independence and belief has the potential to positively influence students incentive to learn and knowledge transfer, leading to a harmonious atmosphere with sustainable professionalism, according to recent empirical studies (Martín-Garin et al., 2021; Riess et al., 2022). Students' positive attitudes and changes in cognitive and affective dimensions can be influenced by inspiration, often referred to as "independent to learn" in the context of sustainability. Teachers' motivation and focus on training material as a means to promote social sustainability, improve daily learning performance, and achieve educational objectives are clear indicators of these achievements (Bekteshi & Xhaferi, 2020; Draghici, 2019). Beliefs, on the other hand, are often understood by teachers as students' ability to incorporate knowledge in future learning programs. Upon returning to the learning environment, students are expected to practice the knowledge, abilities, and attitudes previously learned (Ekamilasari & Permanasari, 2021; Vilmala et al., 2022). Recent studies on higher education learning programs recommended that when teachers fail to engage effectively in planning and administering learning programs, no amount of well-designed sustainable personal learning would be able to accomplish its objectives (Thompson, 2023).

Considering the emphasis of social and personal sustainability on challenge and task commitment or perseverance, no previous study has examined professional sustainability among high-education students with actual subject-matter gaps. Despite calls for more investigations to assist students with professional and regular sustainable development, several problems persist: Regarding professional sustainability, do social and personal advancements contribute to professional sustainability? Examining professional sustainability-based education through the theoretical lenses of social and personal sustainability is pertinent. This cross-sectional study commenced by answering the questions and investigating how sustainable development affects students' personal and social aspects toward professional sustainability. The design was used since the topic had not been significantly explored.

This study delved further into the subject by investigating the function of sustainable professionals as a dependent variable between sustainable personnel and sustainable social in higher education programs. The subsequent section covers the measurement and structural models, outlining the components of

sustainable professional, social, and personal aspects, while exploring the hypotheses. Sustainable professionalism of students in higher education programs is investigated using relevant research approach. This is followed by methods and the presentation and interpretation of the results. Subsequently, the results were discussed and concluded, and the limitations as well as recommendations for further research were presented.

2. Theoretical Background and Hypotheses Examination

This section presents the investigation of numerous essential concepts related to sustainable variables (social, personal, and professional) and their quality by analyzing different literature sources. This explanation aimed to help in designing indicators that could describe latent variables and increase logical flow by studying several variables.

2.1. The Sustainable of Social and Personal

Personal development and social sustainability progress are interdependent. A student's personal-social development includes various facets, including personality, sense of self, social learning, acceptance, creativity, ethnic focus, parent-child relationships, and more. Investment in social development programs is beneficial for the economy and for students (Hendrayani, 2023). A broader discussion regarding other parts of economic policy is necessary when social development is to be the exclusive means of achieving social progress. Several administrative, technical, and political hurdles need to be addressed to make social programs effective. Considering the welfare of both current and future generations is essential to sustainable development, which includes social aspects. Individuals' enthusiasm and outlook shape society's evolution, and people's receptivity to new ideas determines how societies progress. Future societal advances cannot be realized without competent administration, but technology may make it possible (Olsson et al., 2022).

Social sustainability advances faster when more people are willing to try new things and make changes (Leal et al., 2019). According to Matekina et al. (2021), since self-perception and view of the world impact behavior, personal development, and social progress are inseparable and mutually reinforcing. Therefore, this social could lead to actions that foster personal advantages. The following hypothesis was formulated based on the discussion:

Hypothesis 1 (H1): Sustainable social is related to personal.

2.2. The Sustainable Social and Professional

A high degree of socialization is a potent tool for breaking into the workforce and achieving professional sustainability for younger generations (Manni, 2023). However, not all youth have equal access to socialization; for example, students with disabilities are underrepresented in four-year colleges and only attend public or private schools that accept open enrollment. This limitation hinders students from socializing and interacting with classmates professionally, amounting to double discrimination. Typically, young people and children, should be included in and benefit from sustainable social and professional initiatives (Christoforatou,

2021). To avoid wasting human resources and improve people's quality of life, social sustainability in the context of professionals is essential.

Several studies have examined the topic of sustainable social and professional practices in various educational contexts, with (Ahmad et al., 2023) surveying 287 students in Malaysia and (Ghusa, 2021) polling 110 students from multiple medium-sized institutions across three Asian countries. According to the results, two main components of social training make it successful and long-lasting, namely social communication and social objectives. Studies on this topic has shown that sustainable social practices, including clear and consistent communication, can increase students' probability of transferring abilities to new situations. According to Bekteshi and Xhaferi (2020), students should be able to adapt knowledge, skills, and abilities to meet the demands of the modern students market to establish constructive and sustained social change.

Despite receiving less attention and understanding than other parts of sustainability, efforts to include professional and social elements have expanded in various fields. Consequently, professional and social sustainability is defined as equity, but only after considering what that could entail or if equity is enough. Social and professional sustainability are important to students when they are delighted to receive aid from peers and are prepared to give back. The following hypotheses were formulated based on the discussion:

Hypothesis 2 (H2): Objective social is related to professional.
Hypothesis 3 (H3): Communication social is related to professional.

2.3. Sustainable Personal and Professional

Previous studies have not proven sustainable personal as a strong predictor of professionalism. For instance, Zulfarina et al. (2023), narrowly examined belief as one of the components of sustainable professionalism. This is feasible since the use of belief in personal sustainability can encourage students to acquire and hone new abilities in service of professional demands and achieve the objectives of the education system.

Respondents from US educational organizations were surveyed in a study that found sustainable personnel to be a significant predictor of professional learning across a range of educational contexts (Riess et al., 2022). Furthermore, sustainable personal for students includes both objective and communication forms of incentive. One important factor in the incentive to learn is the capacity of education to implement sustainable personal effectively (Wulandari, 2022).

Consistent with the theory, which proposes that independence in a sustainable person increases professional learning, the variable serves as an effective predictor of students' personal learning (Swekwi & Lertlit, 2021). Students often consider educational behavior when encountering this hypothesis. In 1963, the model prioritizing a healthy input-output ratio was widely used. Contribution to a duty is the input, and the benefit or return that results from the duty is the output. There is a considerable professional ability to guarantee equitable professional resource independence and beliefs of personal behaviors. Also, there

are often two distinct approaches to ensuring the equitable allocation of resources. Tolerance, support, loyalty, selflessness, and happiness are all examples of students' beliefs that can pave the path. The second approach is through independence norms, which manifest in tangible ways (salary, rewards, facilities, compensation, recognition, and leave) (Christoforatou, 2021; Desa et al., 2021). Therefore, this theory states that students may be professional enough to learn excellently when there is a suitable medium between independence and beliefs. The following hypotheses were formulated based on the discussion:

Hypotheses 4 (H4): Independence personal is related to professional.
Hypotheses 5 (H5): Belief personal is related to professional.

3. Methods

3.1. Research Design

This study collected and analyzed data using a cross-sectional method, which is commonly used in quantitative research (Ishtiaq, 2019). The method was utilized as it provides a more comprehensive description of the situation. For more reliable results, it is essential to use a quantitative method, like a cross-sectional survey, to gather and analyze data (Byrne, 2019). All three components, namely Social, Personal, and Professional comprised this review. A multitude of variables can be derived from any given element. The following factors were considered, including sustainable social, which entails objective, and communication; sustainable personal, relating to independence, as well as belief and sustainable professional, pertaining to technology, and consistency. The questionnaire was created to gather information on these factors.

An interaction model was created to study the relationship between the four listed components and their contribution to professional sustainability objectives. The structural equation model-Analysis of Moment Structure (SEM-AMOS) is a tool for investigating the relationship between numerous variables in a constant-variable setting (Kline, 2017), and essential for related studies. The three primary components of the competency evaluation are personal, social, and professional sustainability.

3.2. Data analysis

The SEM-AMOS is used to analyze the relationship between variables. According to Helmericks et al. (2017), the relationship might not be directly causal but rather a result of correlation or effect. Kline (2017) stated that this model is commonly referred to as the "whole model" because it incorporates both the measurement model (factor analysis) and the confirmatory factor analysis model. Relevant methods can be used to measure different types of structures. This method is preferable to others as obtaining good model accuracy numbers is challenging due to the factors that could create model mistakes (Romeo & Elleine, 2022).

AMOS 24.0 software was used to evaluate components' discriminant validity in this study. Common model fit indices reported in the paper included Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and Comparative Fit Index (CFI). According to Strajhar et al. (2019), a sufficient model

fit is shown by a CFI value of 0.90 or higher and a TLI value of 0.90 or higher. Another criterion for acceptance is a Root Mean Square Error of Approximation (RMSEA) value below 0.08 (Byrne, 2019).

3.3. Research Model

A conceptual framework was also derived from the literature review. The independent variable in this study was the concept of sustainable social and personal practices. This investigation focused on the longevity of a career. Figure 1 shows that the model used has two direct effects on the professional sustainability of relationships, namely social and personal.

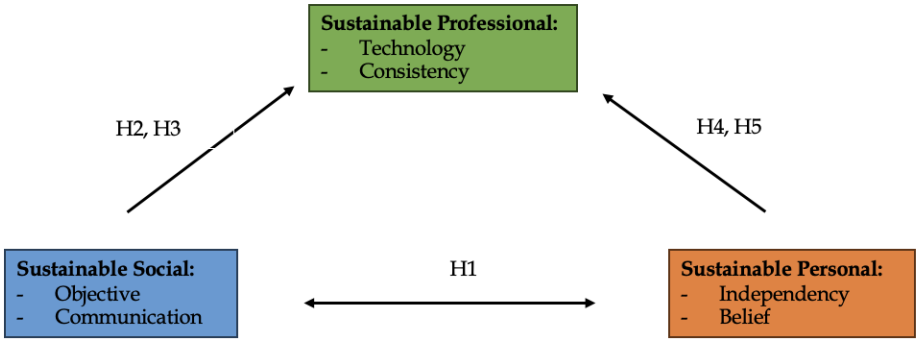

Figure 1. The conceptual framework in this study

3.4. Variable Measurement

The survey questionnaire comprised three components. Firstly, both objective and communication factors were considered when developing sustainable social (Hendrayani, 2023). Previous literature informed eight components of the original model of objective and sustainable social communication. Secondly, ten questions derived from personal sustainability were used and further categorized into independence and belief components (Zulfarina et al. (2023). Lastly, ten items adapted from the literature on technology and consistency components were used to measure sustainable professionalism (Manni, 2023). These issues were evaluated using a five-point Likert Scale, where one represents great dissatisfaction and five represents strong agreement. The questionnaire items were sorted according to the recommendations made by references (Romeo & Elleina, 2022), achieving a composite reliability value and a Cronbach's alpha coefficient greater than 0.7. A five-point scale was selected as it produces more objective feedback and boosts reliability (Byrne, 2019). Meanwhile, demographic factors were implemented as control variables since prior theories and empirical investigations concerning research aims, framework, and hypothesis building did not provide strong support for the position as predictor variables. This survey was used to explore research problems based on students in general, as presented in Table 1.

Table 1. Variable of the study

Construct	Sub-Constructs	Items
Social	Objective	I get to decide what kinds of resources teachers utilize in the classroom.
		By giving extra work, links, and activities for remediation or enrichment, I am able to tailor course material to fit the needs of my friends.
		The purpose of each assignment is laid out in a straightforward manner.
		I have implemented methods that enable me to monitor the advancement of knowledge.
	Communication	Diverse subjects requiring a variety of abilities simultaneously.
		I have clear objectives in mind when working on a project.
		Whenever I struggle to grasp a concept, the teacher may easily access more resources.
		To meet the requirements and interests of my students, I offer a range of materials techniques.
Personal	Independency	Making use of online, organized course materials.
		Changing simulation settings and watching the outcomes.
		Addressing issues with concise resolutions.
		Dealing with problems requiring more than one step to solve or investigate.
		Getting instantaneous responses to issues.
	Beliefs	I have the ability to influence those in positions of power within my community, both personally and institutionally.
		When I meet and converse with someone who is different from me, I feel at ease.
		The majority of people are reliable the most of the time.
		A big part of who I am is embedded in the surrounding ecosystem and scenery.
		I like to think that I have some say in how new ideals and interpretations of our way of life are born.
Professional	Technology	I can quickly change the pace or content of my classes using the high-quality assessment results at my disposal.
		Prompt, useful data is provided by the data system in real-time.
		A variety of achievement metrics are part of my school's data system, allowing me to see how my pupils are doing academically.
		I am able to better inform my lessons because of the detailed information provided by my school' data system.

		I have a lot of data, but I am stuck trying to figure out how to use it to create a set of instructions.
	Consistency	Creating learning process evaluations that are uniquely yours is simple.
		A user-friendly data system is in place at my school.
		The school's data system makes it easy for me to generate the reports and views I require.
		In most cases, the data that are made available by the technology would not be accessible without it.
		When it comes to guiding my lessons, I have the expertise and knowledge to use data.

3.5. Sample and Data Collection

The analysis comprised undergraduate students from three faculties at Universitas Muhammadiyah Purwokerto, Indonesia, namely Teacher Training and Education, Economics and Business, and Pharmacy. The 754 students who comprised the sample were collected from various academic department programs, including pharmacy, accounting, and mathematics.

As part of the purposive sampling technique, 810 paper surveys were distributed to undergraduates in the faculties for about one month. To participate, individuals need to have completed at least one year of college-level coursework, possess some familiarity with the phenomena under study, and have the administrative skills to devise training programs for students. This study utilized a different selection technique since it was unable to provide a list of registered personnel for confidentiality concerns. A random selection technique could not be used due to this constraint. The department heads handed the printed questionnaire to interested students, and subsequently collected and transmitted survey results to the research team.

In response to global issues and Indonesia's grand national vision, education for sustainable development has developed extensive procedures for managing students' information and assessments. Vision and Mission 2030, SDGs, New monetary models, and objectives all fall under this category of Indonesia’s national policies. In addition, the ministry has entrusted professional students with the responsibility of implementing the learning programs in line with the defined objectives, learning outcomes, methods, and contexts to realize the strategic vision and fulfill the purpose. To improve the learning abilities of public students, responsible centers in higher education institutions are enabled to organize learning programs, including the provision of courses, seminars, and training. When deciding on a course of study, sustainable staff can pinpoint areas of expertise in keeping with the department's primary role, which correlates with the institution's mission and vision. Most participants performed well in areas such as information transfer, sustainable social objectives, and communication. This proved that students were more driven to study when there is access to personal and social resources in a long-term professional context, such as tools for

inspiration and conversation during training. Therefore, the incentive might genuinely help spread the word.

The profiles of the respondents are presented in Table 2. Most of the respondents who filled out the survey were in the fourth semester of college (43.1%), majoring in Accounting (45.2%), young adults (46.9%), and male (57.2%). In most cases, a study sample is considered sufficient when it contains more than ten formative indicators on the survey questionnaire and when the items in the measurement model have an outer loading greater than the normal criteria of 0.70. This general guideline states that the sample size should be greater than 200 responses. In order to test the hypotheses, the sample size satisfied all the specified standards.

Table 2. Respondents Data

Profiles	Sub-profile	Frequency	Percentage
Age	Less than 17 years old	189	25.1
	18-20 years old	353	46.9
	21-23 years old	132	17.5
	24 years old and above	80	10.5
Sex	Male	431	57.2
	Female	323	42.8
Department	Mathematics	125	16.0
	Accounting	341	45.2
	Pharmacy	288	38.2
Semester	II	165	21.8
	IV	325	43.1
	VI	211	28.0
	VIII	53	7.1

4. Results

SEM-AMOS 24.0 program was used to analyze the survey results. The following steps were considered in analyzing data, first, research instruments were validated and shown to be reliable by a measurement model analysis (Kline, 2017). Second, a structural model analysis was used to further investigate the direct influence of personal and social sustainability toward professional sustainability. Formulating hypotheses was challenging when the t-value reached a significant level of 1.95. Third, the R2 value was used to measure the study model's exploratory power according to three main criteria, namely strong at 0.26, moderate at 0.13, and weak at 0.02. Fourth, a good match between the model and the data was defined as an estimated standardized root-mean-square residual (SRMR) value below 0.10 and 0.08 (Linny et al., 2021). Lastly, according to three essential criteria, an f2 value was used to identify the influence of size, namely 0.35 for large, 0.15 for medium, and 0.02 for tiny. According to (Abrahim et al., 2019), the construct achieved the prediction accuracy required by measuring the blindfolding value (Q2) using a value threshold greater than zero. The ability to conduct relative and formative analyses on the measurement model data in tandem is a strength of the SEM-AMOS package. In addition, it can handle data from small samples, has an appealing user interface, and does not require regularly distributed data (Shaheen et al., 2017).

4.1. Evaluating Construct and Discriminant Validity

A reflective measurement model is used to evaluate two types of reliability and validity analyses, namely convergent and discriminant. Indicators can be considered as meeting convergent validity when having a large amount of expected variation. The reflective measurement model's convergent validity can be evaluated using factor loading, composite reliability, and Average Variance Extracted (AVE). The reflective measurement model was assessed using the loading rate, AVE, and Composite Reliability (CR) values, as presented in Table 3. The loading value for the item-concept association was more than 0.70. However, a value greater than 0.50 was found for the AVE. According to Byrne (2019), all constructs met the convergent validity criterion because the composite reliability value was more than 0.70. Table 3 presents the reflective measurement model.

Table 3. The Measurement Model of Evaluation

Constructs	Outer loading	Cronbach Alpha	CR	AVE
Sustainable Social: Objective				
Obj1	0.472	0.842	0.844	0.782
Obj2	0.841			
Obj3	0.801			
Obj4	0.803			
Sustainable Social: Communication				
Com1	0.664	0.871	0.934	0.742
Com2	0.761			
Com3	0.652			
Com4	0.764			
Sustainable Personal: Independence				
Indep1	0.601	0.782	0.824	0.714
Indep2	0.653			
Indep3	0.704			
Indep4	0.732			
Sustainable Personal: Belief				
Bil1	0.833	0.841	0.845	0.733
Bil2	0.824			
Bil3	0.812			
Bil4	0.762			
Sustainable Professional: Technology				
Tech1	0.851	0.835	0.841	0.724
Tech2	0.852			
Tech3	0.912			
Tech4	0.902			
Sustainable Professional: Consistency				
Const1	0.913	0.942	0.945	0.755
Const2	0.892			
Const3	0.871			
Const4	0.742			

The results of the discriminant validity test, as assessed by SEM-AMOS, are presented in Table 4. It was shown that all of the components achieved

discriminant validity (Strajhar et al., 2019), as the values for the constructs were less than 0.85.

Table 4. The Discriminant Validity

Constructs	Objective	Communication	Independency	Belief	Technology
Objective					
Communication	0.842				
Independency	0.782	0.788			
Belief	0.847	0.672	0.673		
Technology	0.644	0.613	0.633	0.768	
Consistency	0.731	0.744	0.761	0.844	0.782

4.2. Structural Model

The results of the structural model showed the direct effects for all variables in the study. Model fit test results showed that SRMR was less than 0.046, which was less than 0.10 or 0.08 (Byrne, 2019), confirming a good fit for the data. The model's efficacy was also evident, as the strength test (R2) showed that the objective component component accounted for a statistically significant 0.86% of sustainable social. The model explained 0.82 percent of the variation in long-term social sustainability, as shown by communication statistics (Abrahim et al., 2019). Similarly, the variable in sustainable personal explained 0.86% of the variance in independence drive, and belief incentive explained only 0.71% of the variance in long-term personal sustainability, showing a significant influence. Finally, the model explained 85% of the variation in professional sustainability, with technology accounting for 96% of the impact, specifically concerning sustainable professionals' consistency.

Regarding the third point, an f^2 value of 0.00 (less than 0.02) showed that communication did not impact belief accounts. According to (Abrahim et al., 2019), an f^2 value of 0.130 is higher than 0.02 but lower than 0.15, showing no statistically significant relationship between intrinsic and objective independence. Similarly, an f^2 value of 0.041, greater than 0.02 but less than 0.15 showed a weak relationship between beliefs and objectives. A low f^2 value of 0.00, less than 0.02, showed that individual motivation had minimal effect on long-term career success. Social sustainability marginally affected professional transmission, with an f^2 value of 0.141—higher than 0.15 but lower than 0.35 (Strajhar et al., 2019). Lastly, the impact result's 0.86 f^2 value showed a significant long-term personal effect on society. The structural model capable of making predictions is presented in Figure 2.

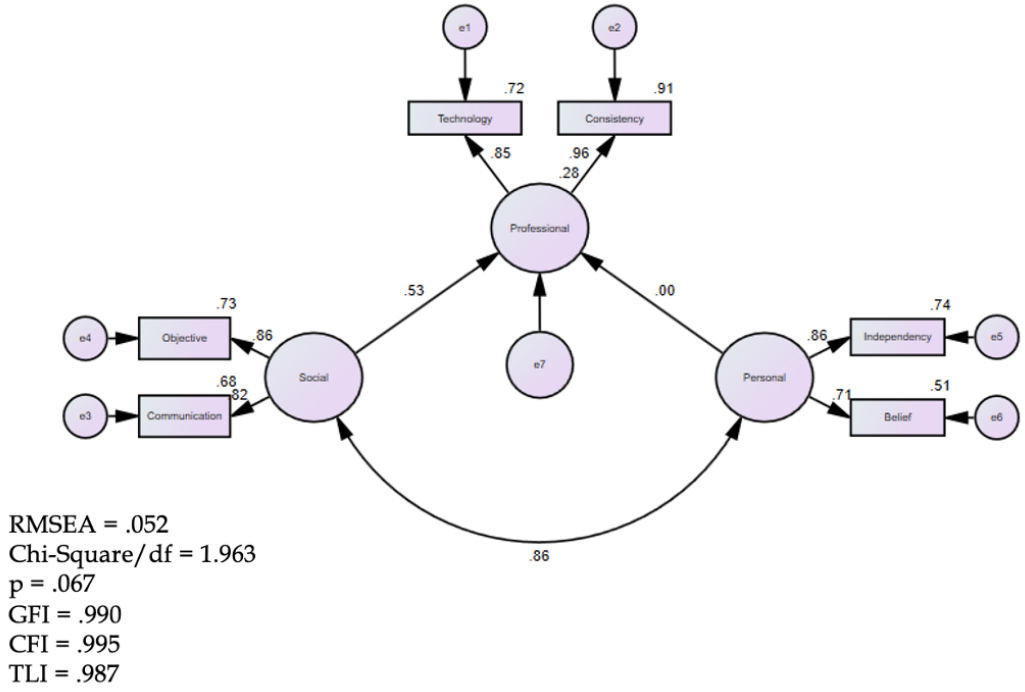

Figure 2. The Structural Model of The Study

4.3. The Hypotheses Testing Outcome (H1 – H5)

In Table 5, the results of hypothesis testing concerning the direct model are presented as follows (1) The evidence supported the claim that social and personal relationships were positively and significantly related (β = 0.863; t = 4.244) and the acceptance of H1. (2) Since t-value was less than 3.431, the hypothesis that communication is associated with professionals cannot be accepted (β = 0.821; t = 1.324). (3) The results showed a positive and significant relationship between personal independence and professional sustainability (β = 0.864; t = 5.249). supporting H3. (4) There was a strong and positive relationship between independence and professionalism (β = 0.864; t = 3.554), supporting H4. (5) There was a positive relationship between personal belief and sustainable professional practice (β = 0.713; t = 1.334). However, t-value was not significant (t<3.43), showing the rejection of H5. The results showed individual and group factors were crucial for promoting learning and the dissemination of professional sustainability. However, the assessment did not consider belief or objective social factors.

Table 5. The Hypotheses Outcome

Hypotheses	β-values	t-values	p-values	Result
H1: Sustainable social is related to personal	0.862	* 4.244	0.000	Accepted
H2: Objective social is related to professional	0.863	* 1.324	0.000	Not Accepted
H3: Communication social is related to professional	0.821	* 5.249	0.000	Accepted

H4: Independence personal is related to professional	0.864	* 3.554	0.000	Accepted
H5: Belief personal is related to professional	0.713	* 1.334	0.000	Not Accepted

Significance level: * t > 3.43 (p < .001)

5. Discussions

This literature review established a theoretical framework for degree programs in higher education. This study showed all three dimensions of sustainability, namely professional, social, and personal, made significant contributions. The results showed that students were considerably more motivated to attend class, actively participate, and acquire new skills when personal suitability can offer sustained social integration, and incorporating objectives and communication. Consequently, this incentive may encourage college students to share knowledge.

The analyses showed a wide variety in how social and personal sustainability complemented, improved, and composed one another on the students' life stage. Respondents' personal sustainability is enriched by professional activities and vice versa, as professional endeavors improve personal lives (Hendrayani, 2023). Therefore, there should be multiple pathways to succeed in life and learning, as shown by respondents comments (Leal, 2021).

According to responses, habits formed from regular practice of particular personal sustainability or other interests are beneficial in efficiently executing professional sustainability. In addition, the interest in culture and art, outside academic pursuits, improved professional actions by broadening perspectives and exposing the students to different ideas (Zulfarina et al., 2023). Family was frequently cited as a factor that helps manage time and fulfill learning obligations efficiently. Respondents also stressed being occasionally outgoing, careful, organized, and consistent in private lives and non-professional activities as a result of their professional activities, reflecting the uniqueness of learning experiences (Swekwi & Lertlit, 2021). Several respondents mentioned that responsibilities as parents or spouses inspired the demand for more harmony between professional and personal sustainability and help in pursuing aspirations.

Sustainable social also had an effect on sustainable professionals (Martín-Garin et al., 2021; Novidsa et al., 2020). Communication includes traits like social learning, empathy, values, well-being, counsel, encouragement, and tolerance, while objectives include justice, ethics, a training environment, and possibilities for collaboration, as well as the provision of learning resources and facilities. The current study offered valuable insights into how communication could bridge the gap between students in Indonesia's higher education programs and sustainable professionals. It also reinforced previous studies primarily disseminated in Western and Asian countries (Leal, 2021; Olsson et al., 2022).

Sustainable professional, on the other hand, had no effect on sustainable individuals, contradicting (Perwitasari et al., 2023; Sukmanasa et al., 2023). The

literature review in this study found that independence was not a good indicator of long-term career success for several reasons. Firstly, teachers' management was not adequately aligned. This could undermine students' sense of autonomy and impede the ability to transfer learning to other mental and physical curriculum areas. Secondly, instructional programs may neglect students' needs and objectives in favor of improving beliefs. Disregarding these results could lead to unfavorable classroom behavior and attitudes, as well as a decline in students' intrinsic motivation.

Some of the most essential principles of Education for Sustainable Development (ESD) include treating all students fairly and striving to make professionals more sustainable (Conradty & Bogner, 2022). Teachers preparation programs prioritize professional sustainability beyond the classroom to help future educators address the complex issues facing the communities they intend to teach. These programs should acknowledge the importance of broader professional experiences in shaping future higher education programs (Zulfarina et al., 2023). The results were supported by Zulfarina et al. (2023), stating that teachers had a responsibility to equip students with subject-specific knowledge as well as opportunities to reflect on and discuss broader personal, societal, and professional concerns. Participation in authentic, real-world activities enriches both the learning process and students outcomes.

5.1. Theoretical Implications

This study considered both theoretical and real-world factors. The result supported the theory that long-term social motivation to learn is associated with long-term individual sustainability, holding significant theoretical implications. It also correlated with adult learning theory (Wulandari, 2022), showing that students acquire practical skills through careful observation and analysis in social settings. Therefore, successful social sustainability may encourage more individuals to engage in highly beneficial behaviors, such as sharing acquired knowledge. The study also found that managers' strong beliefs in and connections with students could facilitate commitment to education. This commitment to educate students can lead to increased professional activities aimed at promoting sustainability.

5.2. Practical Implications

This study had significant practical implications for improving sessions for sustainable professionals, benefiting students in higher education programs. It also showed that teachers should address the critical personal challenge of low professional learning. Students were recommended to address the following challenges to achieve this objective. First, participating in training programs, strongly promoted by professors could improve students' performance and motivate gifted pupils to maintain excellent work and improve academic performance. Second, organizing training programs that significantly impact students' career advancement was essential. This includes providing training-materials incorporating theoretical background and hands-on experience. Third, students with advanced degrees should excel in both oral and written communication. Educators should consider effective methods for sharing crucial learning programs with students and be flexible enough to adapt to new

strategies, such as requesting feedback from students. Fourth, teachers were responsible for ensuring that classrooms are comfortable, up-to-date, adequately furnished, and visually appealing to motivate students to engage in learning and maximize its benefits actively. Fifth, educators should evaluate students work fairly and offer constructive criticism.

Future studies and educational initiatives should focus on the importance of independence and belief as foundational elements of long-term personal learning. This study showed that teachers' effective communication and building independent relationships with students from diverse backgrounds during formal and informal learning activities could significantly improve students' attitudes and behaviors, including career achievement, skills, and motivation. This positive effect could help preserve or improve students' competitiveness and performance in coping with globalization and challenging times.

5.3. Limitations and Recommendations for Further Research

This study had several conceptual and methodological issues, firstly, the cross-sectional study design only offered a broad overview of the dependent variable (sustainable professional) and independent variables (sustainable personal and social). It also lacked specificity in measuring the dimensions of the study variables. Secondly, the study only focused on undergraduates and their learning. Thirdly, data were obtained using a purposive sample technique, which introduced bias into respondents' responses. These limitations restricted the generalizability of the results to other educational systems with different patterns and histories. Certain steps should be considered to improve the reliability of future studies.

The recommendations could be instrumental for future investigations. Firstly, it was crucial to prioritize demographic data (respondents' position status and wage) in future model testing to compare and contrast responses in relation to the research variables. This could provide valuable insights on how students' individual traits impacted sustainable teaching in the classroom. Research experts were recommended to evaluate the performance of hypothetical models using various subsamples. Long-term studies should also be considered in future research endeavors. Fourthly, both public and private sectors should be prioritized to improve the efficiency of research design. The literature review of higher education programs was recommended to consider additional factors. For instance, learning material could serve as an independent variable, while motivation to learn and transfer could be mediating variables, and learning competency, in-role behavior, and learning behavior could be dependent variables.

6. Conclusion and Recommendations

In conclusion, this study investigated a conceptual framework based on the literature on higher education programs. The research instrument used passed all tests of validity and reliability. Results from the research model showed a significant interest in understanding the relationship between sustainable personal information and learning about sustainable social issues. These results

supported other studies whose scope transcended Western and Asian countries. Learning independence was crucial to long-term personal success and should inform educational policy and practice. Subsequently, teachers' ability to communicate effectively in the classroom significantly affected students' professional learning. This communication could improve outcomes like professional learning, systematic application of knowledge, adaptability to new situations, and absorption of compelling content, contributing to the SDGs and the maintenance of educational plans.

The results also showed the importance of incorporating learning incentives and supported the premise that sustainable communication social and independent personal training could increase students' professional learning. Personal cognitive and emotional abilities, knowledge, attitudes, talents, and skills could progress in this context. Organizations might be able to maintain and improve performance, even in a world where radical changes are both inevitable and difficult to forecast. Future studies are recommended to include longitudinal designs in order to draw causal conclusions and track changes over time. Furthermore, the results could not be generalized to other departments as the sample was only undergraduates. This necessitated the collection of data from multiple departments within the same or a separate faculty to validate the results.

7. References

Abrahim, S., Mir, B. A., Suhara, H., Mohamed, F. A., & Sato, M. (2019). Structural equation modeling and confirmatory factor analysis of social media use and education. *International Journal of Educational Technology in Higher Education*, *16*(1), 11–19. https://doi.org/10.1186/s41239-019-0157-y

Adiatma, T. (2023). Manajemen Pendidikan Tinggi untuk Mempromosikan Pembangunan Berkelanjutan yang Komprehensif di Masyarakat. *Jurnal Manajemen Pendidikan Dasar, Menengah Dan Tinggi (JMP-DMT)*, *4*(2), 182–188.

Ahmad, N., Toro-Troconis, M., Ibahrine, M., Armour, R., Tait, V., Reedy, K., Malevicius, R., Dale, V., Tasler, N., & Inzolia, Y. (2023). CoDesignS Education for Sustainable Development: A Framework for Embedding Education for Sustainable Development in Curriculum Design. *Sustainability*, *15*(23), 164–175. https://doi.org/10.3390/su152316460

Bekteshi, E., & Xhaferi, B. (2020). Learning about Sustainable Development Goals through English Language Teaching. *Research in Social Sciences and Technology*, *5*(3), 78–94. https://doi.org/10.46303/ressat.05.03.4

Byrne, B. M. (2019). Structural Equation Modeling with Amos: Basic Concepts, Applications and Programming. *Journal of Applied Quantitative Methods*, *5*(2), 365–367.

Camilleri. (2020). The Sustainable Development Goal on Quality Education. *CSR, Sustainability, Ethics & Governance*, *3*(1), 1–21.

Christoforatou, E. (2021). Teacher education for sustainable development within national frameworks: Squaring the circle from a German perspective. *International Journal of Development Education and Global Learning*, *13*(1). https://doi.org/10.14324/ijdegl.13.1.01

Conradty, C., & Bogner, F. X. (2022). Education for Sustainable Development: How Seminar Design and Time Structure of Teacher Professional Development Affect Students' Motivation and Creativity. *Education Sciences*, *12*(5), 1–16. https://doi.org/10.3390/educsci12050296

Desa, S., Abdullah, M. S., Ab Mutalib, N. H., & Mansor, R. (2021). The readiness of integrating sustainable development into biology teacher education program. *Cakrawala Pendidikan*, *40*(2), 305–315. https://doi.org/10.21831/cp.v40i2.37116

Draghici, A. (2019). Education for sustainable development. *MATEC Web Of Conferences 290*, 1–14. https://doi.org/10.1051/matecconf/20192

Ekamilasari, & Permanasari, A. (2021). Critical thinking skills and sustainability awareness for the implementation of education for sustainable development. *Journal of Science Education Research Journal*, *2021*(1), 46–53. www.journal.uny.ac.id/jser

Eliaumra. (2021). Education for Sustainable Development. *Jurnal Kependidikan* , *10*(1), 43–59.

Fajar Nugroho, O., Permanasari, A., & Firman, H. (2021). Persepsi dan Praktik Pendidikan Berkelanjutan di Indonesia untuk Education for Sustainability Development (ESD). *Eduscience: Jurnal Ilmu Pendidikan*, *7*(1), 45–51.

Ghusa, S. (2021). Implementation of Education for Sustainable Development (ESD). *Jurnal Spektrum Analisis Kebijakan Pendidikan*, *10*(3), 80–100.

Gunamantha, I. M. (2020). Pendidikan untuk Pembangunan Berkelanjutan: Mengapa, apa dan bagaimana. *Jurnal Pendidikan Dan Pengajaran*, *43*(3), 215–221.

Hamidah, N., Koosbandiah Surtikanti, H., & Riandi, D. (2023). Implementasi education for sustainable development (ESD) pada universitas lintas negara terhadap tingkat pengetahuan dan perilaku kesadaran lingkungan mahasiswa. *Asian Journal Collaboration of Social Environment and Education AJCSEE*, *1*(1), 31–42. https://doi.org/10.61511/ajcsee.v1i

Helmericks, S. G., Nelsen, R. L., & Unnithan, N. P. (2017). The Researcher, the Topic, and the Literature: A Procedure for Systematizing Literature Searches. *The Journal of Applied Behavioral Science*, *27*(3), 285–294. https://doi.org/10.1177/0021886391273004

Hendrayani, Y. (2023). Mapping of Sustainable Development in Indonesia Through Education for Sustainable Development. *EKSPRESI DAN PERSEPSI : JURNAL ILMU KOMUNIKASI*, *6*(3), 409–422. https://doi.org/10.33822/jep.v6i3.6484

Ishtiaq, M. (2019). Book Review Creswell, J. W. (2014). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.). Thousand Oaks, CA: Sage. *English Language Teaching*, *12*(5), 40–51. https://doi.org/10.5539/elt.v12n5p40

Kline, R. B. (2017). Principles and Practice of Structural Equation Modeling. *Journal Basic of Education*, *3*(21), 445–458.

Krayneva, R., Rudenko, A., & Motylev, R. (2021). Role of education in implementing the sustainable development strategy. *E3S Web of Conferences*, *250*, 1–7. https://doi.org/10.1051/e3sconf/202125007008

Leal, W. (2021). Non-conventional learning on sustainable development: achieving the SDGs. *Environmental Sciences Europe*, *33*(1), 1–4. https://doi.org/10.1186/s12302-021-00525-8

Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Veiga Ávilae, L., Londero Brandli, L., Molthan-Hill, P., Pace, P., Azeiteiro, U. M., Ruiz Vargas, V., & Caeiro, S. (2019). Sustainable Development Goals and Sustainability Teaching at Universities: Falling Behind or Getting Ahead of the Pack? *Journal of Cleaner Production*, *232*, 285–294.

Little, T. D., Card, N. A., Bovaird, J. A., Preacher, K. J., & Crandall, C. S. (2021). Structural equation modeling of mediation and moderation with contextual factors. *Modeling Contextual Effects in Longitudinal Studies*, *4*(June), 207–230. https://doi.org/10.4324/9780203936825

Manni, A. (2023). Education "through" sustainable development in Swedish school-age educare–exploring how SAEC is responding to ESD in daily practices. *Education Inquiry*, *October*, 1–19. https://doi.org/10.1080/20004508.2023.2265634

Martín-Garin, A., Millán-García, J. A., Leon, I., Oregi, X., Estevez, J., & Marieta, C. (2021). Pedagogical approaches for sustainable development in building in higher education. *Sustainability (Switzerland)*, *13*(18), 22–35. https://doi.org/10.3390/su131810203

Matekina, T., Soroka, M., & Stolyarova, V. (2021). Designing an Education System for Sustainable Development. *E3S Web of Conferences*, *295*, 1–7. https://doi.org/10.1051/e3sconf/202129505022

Musyarofah, S. (2021). Konsep Sustainability Report bagi Pendidikan Tinggi di Indonesia. *Jurnal Inovasi Badan Penelitian Dan Pengembangan*, *8*(2), 177–184.

Ningrum, M., Hasanah, E., & Dahlan, U. A. (2021). Manajemen Kurikulum dan Implementasi Education for Sustainable Development pada Perguruan Tinggi. *Jurnal Pendidikan Dan Ilmu Pengetahuan*, *21*(2), 119–130.

Novidsa, I., Purwianingsih, W., & Riandi, R. (2020). Exploring knowledge of prospective biology teacher about Education for Sustainable Development. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *6*(2), 317–326. https://doi.org/10.22219/jpbi.v6i2.12212

Olsson, D., Gericke, N., & Boeve-de Pauw, J. (2022). The effectiveness of education for sustainable development revisited–a longitudinal study on secondary students' action competence for sustainability. *Environmental Education Research*, *28*(3), 405–429. https://doi.org/10.1080/13504622.2022.2033170

Parry, S., & Metzger, E. (2023). Barriers to learning for sustainability: a teacher perspective. *Sustainable Earth Reviews*, *6*(1), 1–14. https://doi.org/10.1186/s42055-022-00050-3

Perwitasari, S. I., Hariyono, E., & Susantini, E. (2023). Implementation of ESD (Education for Sustainable Development) in Climate Change Learning: A Literature Review. *IJORER : International Journal of Recent Educational Research*, *4*(4), 399–415. https://doi.org/10.46245/ijorer.v4i4.317

Riess, W., Martin, M., Mischo, C., Kotthoff, H. G., & Waltner, E. M. (2022). How Can Education for Sustainable Development (ESD) Be Effectively Implemented in Teaching and Learning? An Analysis of Educational Science Recommendations of Methods and Procedures to Promote ESD Goals. *Sustainability (Switzerland)*, *14*(7), 1–17. https://doi.org/10.3390/su14073708

Romeo S. Berba, & Elleine Rose A. Oliva. (2022). a Structural Equation Model on Research Skills. *EPRA International Journal of Multidisciplinary Research (IJMR)*, *7*(January), 212–218. https://doi.org/10.36713/epra9388

Shaheen, F., Ahmad, N., Waqas, M., Waheed, A., & Farooq, O. (2017). Structural Equation Modeling (SEM) in Social Sciences & Medical Research: A Guide for Improved Analysis. *International Journal of Academic Research in Business and Social Sciences*, *7*(5), 132–143. https://doi.org/10.6007/ijarbss/v7-i5/2882

Strajhar, P., Schmid, Y., Liakoni, E., Dolder, P. C., Rentsch, K. M., Kratschmar, D. V., Odermatt, A., Liechti, M. E., Ac, R., No, N., No, C., Oramas, C. V., Langford, D. J., Bailey, A. L., Chanda, M. L., Clarke, S. E., Drummond, T. E., Echols, S., Glick, S., … Mogil, J. S. (2019). Structural Equation Modeling Basic Assumtions and Concepts: a Novices Guide. *Nature Methods*, *7*(6), 20–35.

Suherman, J., Najmul Hidayat, A., Dede Khoeriah, N., & Saeful Insan, H. (2022). Budget-Based Education Financing Management. *Journal of Islamicate Studies*, *5*(1), 113–125. https://doi.org/10.32506/jois.v5i1.721

Sukmanasa, E., Suryanti, Y., & Aisyah, S. (2023). Relevance of 21st Century Skills in Dealing with Sustainable Development Goals Through The Independent Campus Learning Program. *Journal of Education & Teaching Primary School Teachers*, *6*(1), 123–128.

Swekwi, U., & Lertlit, S. (2021). Education for Sustainable Development: The Production of Talented Teachers in Science and Mathematics Project. *Asian Journal of Management Sciences & Education*, *10*(2), 16–25.

Tejedor, G., Sánchez-Carracedo, F., & Segalàs, J. (2022). Education for Sustainable Development in Higher Education-Introduction to a Special Issue. In *Sustainability (Switzerland)* (Vol. 14, Issue 17, pp. 11–23). MDPI. https://doi.org/10.3390/su141710530

Thompson, R. P. (2023). Journal of Learning Development in Higher Education Integrating education for sustainable development in learning development practice within a university humanities and social sciences faculty. *Journal of Learning Development in Higher Education*, *October*(29), 1–6.

Vilmala, B. K., Karniawati, I., Suhandi, A., Permanasari, A., & Khumalo, M. (2022). A Literature Review of Education for Sustainable Development (ESD) in Science Learning: What, Why, and How. *Journal of Natural Science and Integration*, *5*(1), 35. https://doi.org/10.24014/jnsi.v5i1.15342

Wulandari, P. (2022). Membumikan Education for Sustainable Development (ESD) di Indonesia dalam Menghadapi Isu-isu Global. *Purwadita*, *2*(2), 42–49.

Zulfarina, Z., Azizahwati, A., & Ruslindawati, R. (2023). Analysis of Education for Sustainable Development (ESD) as a Basis for Development of Biotechnology Teaching Materials. *SHS Web of Conferences*, *17*(3), 20–30. https://doi.org/10.1051/shsconf/202317302001