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A CAUSAL MODEL OF EXPERIENTIAL LEARNING, COMMUNITY PARTICIPATION, AND SOCIAL INNOVATION ON THE POTENTIAL OF SMART SOCIAL ENGINEER

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ABSTRACT

This research aims to study and develop a causal model of experiential learning, community participation, and social innovation that affects the potential of smart social engineers in the context of Rajabhat Universities in Thailand. The research employed a quantitative research methodology with a sample of 297 social engineers from Rajabhat universities across Thailand, obtained through stratified random sampling. The research instrument was a questionnaire. Data were analyzed using descriptive statistics, Pearson correlation analysis, and structural equation modeling. Descriptive research findings revealed that the variables of experiential learning, community participation, social innovation, and the potential of smart social engineers all had average scores at a high level. Correlation analysis showed that experiential learning, community participation, social innovation, and the potential of smart social engineers had a statistically significant positive correlation. Structural equation modeling revealed that experiential learning and community participation had a statistically significant positive direct influence on the development of social innovation. Furthermore, social innovation had a statistically significant positive direct influence on the potential of smart social engineers. However, we found no direct influence of experiential learning and community participation on the potential of smart social engineers. In contrast, indirect influence analysis showed that experiential learning and community participation significantly impacted the potential of smart social engineers through social innovation. The research concludes that developing the capabilities of smart social engineers requires a focus on designing experiential learning that integrates systematic community participation processes. These processes should be driven towards developing social innovations that can be applied to solve problems and meet community needs concretely. Social innovation serves as a key mechanism

for linking the influence of experiential learning and community participation to effectively enhance the capabilities of smart social engineers.

KEYWORDS: Experiential Learning, Community Participation, Social Innovation, Smart Social Engineer.

1. INTRODUCTION

Currently, developing the skills and readiness for life and work of the nation's citizens, especially students who are the new generation of society, is a key goal of higher education amidst the rapid changes in the economic, political, social, community, environmental, and technological contexts. Today's students, who will become the main workforce of the country in the future, need diverse competencies appropriate to these changes. These include the ability to learn, think critically, work in teams, adapt, and be creative and innovative, as well as be good citizens who contribute to the community and society in which they live to develop and ensure sustainability. Policies and strategies that enable young people to learn and develop themselves deeply and sustainably from real-world situations, particularly by learning within community contexts and collaborating with others, play a crucial role in enhancing their potential as intelligent citizens prepared to tackle the challenges of the future world.

Recently, Thai universities, particularly the Rajabhat University group, have elevated their role to go beyond that of educational institutions, aiming to be partners with communities for sustainable local development. This includes instilling a sense of social responsibility in students and the younger generation through a process called "social engineering." This involves providing students with opportunities to conduct fieldwork, study community problems, understand the local society, develop collaborative skills for working with communities, and design innovative solutions that appropriately address local contexts. This process emphasizes learning through practice and solving real-world problems that students will face in the modern world.

The potential of social engineers to become brilliant individuals through experiential learning has been recognized as an effective approach to developing skills relevant to modern work and life. Experiential learning comprises key elements that reflect deep learning and are connected to community contexts: direct experience in real-world settings emphasizing learning from real-world community situations; individual and group reflection for systematic learning; conceptual synthesis leading to transformative change and the development of new ideas from experience; and the application of these ideas in the community to create tangible impact (Anwar, Suryajaya, & Suyidno, 2025; Bower, 2013; Schreck, Weilbach, & Reitsma, 2022; U-senyang, 2024). On the other hand, the concept of community participation has received continuous attention as a key mechanism for sustainable social development, especially when linked to civic development in local areas through learning and practical application. Previous research has found that genuine participation requires more than just a space to speak; it must include processes that foster shared ownership of problems and collaboratively find solutions within the community (Wannawijit, Chanchaichinnaworn, Kaewsathuan, & Wasayangkul, 2025; Zhang, You, Pundir, & Meijering, 2023). From the above, it can be seen that Rajabhat Universities play a significant role in local development through the learning processes of their students in the form of social engineers. The program is therefore a crucial learning mechanism for students in bridging theory with real-world situations, based on the application of the concept of community participation.

Furthermore, recent years have shown that the development of social innovation has become a crucial mechanism for driving sustainable development in many countries worldwide, especially in communities and cities facing diverse problems such as poverty, inequality, and rapid social and environmental change. Previous research has emphasized that social innovation cannot arise solely from ideas or technologies but requires a collaborative learning process and the participation of all sectors, particularly the local population (Ciccarino & Rodrigues, 2023; Kassim et al., 2022; von Schnurbein, Potluka, & Mayer, 2023). In the context of Thailand, Rajabhat Universities, as higher education institutions with a mission to develop local communities, play a vital role in promoting social innovation through area-based learning processes that allow students to engage in practical activities in the community. This approach relies on experiential learning that connects direct experience, reflection, and experimentation with new approaches in real-world situations, combined with community participation that emphasizes collaborative decision-making, joint action, benefit sharing, and joint evaluation.

As mentioned above, the researchers recognize the importance of developing social innovation rooted in collaborative learning between students and the community and the balanced development of human and social capital. This research aims to create new knowledge by developing it based on concepts and factors related to experiential learning, community participation, social innovation, and the potential of intelligent social engineers. The results will be a new model to help plan and program

activities that allow citizens to participate in real-world community situations through processes of practice, reflection, and developing new approaches in collaboration with local people or communities. This model can be used as a guideline for creating participatory processes from decision-making and implementation to benefit sharing and joint evaluation. This will promote innovation that not only addresses community needs but also cultivates the characteristics of intelligent citizens ready to face the new challenges of the future global society. Therefore, this research is not merely a study of the relationship between the aforementioned variables but a study that develops new knowledge that can be used as a guideline for human resource development at the higher education level, especially in Rajabhat Universities, which have a mission to develop sustainable local communities according to the social engineering approach. The researchers believe that the research results will support and promote the creation of a lifelong learning environment and the development of students' potential so that they can become key mechanisms for driving community and national development in the future.

2. LITERATURE REVIEW AND KEY THEORIES

2.1. Literature Review

2.1.1. Experiential Learning

In 1984, Kolb proposed the experiential learning theory, which has found application in academic work in education and human resource development worldwide. This theory defines "experiential learning" as a learning process that occurs through direct interaction with the environment or real-life situations, resulting in the learner constructing knowledge from their experiences (Ajani, 2023; Shore & Dinning, 2023). Furthermore, Dewey supported this concept, pointing out that learning occurs through interaction between individuals and their environment, enabling learners to effectively connect existing knowledge with the outside world (Dewey, 1997). Experiential learning theory comprises four learning cycles: engaging in direct experience, reflection, constructing new concepts, and applying acquired knowledge to new situations. This process promotes individual learning by emphasizing the development of cognitive skills and their practical application in life (Kolb, 2015; Moore, Boyd, & Dooley, 2010; Rittipakdee, Prateungthai, & Naruphai, 2025; Shore & Dinning, 2023). Experiential learning is considered one of the most effective learning components because it allows learners to experiment and experience real-world situations. This helps learners effectively connect theory with practical application. Experiential learning not only makes learned content more meaningful but also fosters a deeper understanding of the subject matter. It also promotes the development of essential skills necessary for future life, such as critical thinking, collaboration, and problem-solving (Anwar, Suryajaya, & Suyidno, 2025; Mamatha, 2021; Thongkamsuk, 2024; U-senyang, 2024). Experiential learning forms the basis of both individual and group learning, leading to experimentation and knowledge exchange within learning groups, a process that occurs continuously (Bartels, 2023).

2.1.2. Community Participation

Community participation is a crucial factor contributing to the sustainable success of community-related development projects in local areas. Community involvement in decision-making enhances transparency and ensures development truly aligns with the needs of the local community (Wannawijit et al., 2025; Teng et al., 2025). Community participation positively impacts student development in several ways, which is essential for addressing specific local or community problems. Developing students through community participation leads to a deeper understanding of community social issues, resulting in the creation of creative and effective solutions applicable to real life (Rittipakdee, Prateungthai, & Naruphai, 2025). Working collaboratively in a real-world context, this learning approach enables learners to gain a deeper understanding of community issues and apply their knowledge to solve environmental problems sustainably, such as natural resource and environmental management or environmental conservation projects. This not only builds academic knowledge but also fosters social responsibility and sustainable community development (Rittipakdee, Prateungthai, & Naruphai, 2025; Teng et al., 2025). Furthermore, community participation networks that promote local development involvement empower communities to effectively manage and contribute to their own development and resource management. Therefore, relevant agencies, particularly government bodies, should continuously build community participation networks to ensure successful community engagement (Wannawijit et al., 2025). Community-based development can create community-based organizations that are more effective at solving complex problems and contribute to more sustainable community and social development

(Kato, 2025).

2.1.3. Social Innovation

Social innovation is crucial for solving problems and challenges in contemporary society (Planells-Aleixandre, García-Aracil, & Isusi-Fagoaga, 2025). Social innovation is a form of innovation that is distinctly separate from other types of innovation because it has a clear link to social issues and social values (Repo & Matschoss, 2019). Universities are a vital source of resources for developing social innovations to address social issues (McKelvey & Zaring, 2018; Planells-Aleixandre, García-Aracil, & Isusi-Fagoaga, 2025). Currently, social innovation is becoming increasingly important in relation to a variety of social and environmental goals, including multi-organizational collaboration, with a crucial focus on economic transformation and progress (Appiah & Grimm, 2024; Pieri & Teasdale, 2021; Edwards-Schachter, Matti, & Alcántara, 2012). Social innovation refers to new ideas for creating new social relationships or collaborations aimed at meeting societal needs, creating social values, or even transforming the structure of society (Appiah & Grimm, 2024; Satalkina & Steiner, 2022). The development of social innovation is vital for solving social problems through the thinking and decision-making processes of collaborative groups with shared goals for addressing social issues (Dawson & Daniel, 2010). Today, social innovation focuses on both individual and group levels, involving collaboration across multiple sectors to solve social problems, with an increasing emphasis on policy and practitioner perspectives in the field (Appiah & Grimm, 2024; Pieri & Teasdale, 2021). To effectively solve societal problems, especially through the application of social innovation, it is essential to develop individuals with a volunteer spirit, skills, and the commitment to becoming responsible citizens dedicated to solving social or community problems (Amin & Pietro, 2025). Empowering individuals is a crucial factor in developing social innovations that can effectively and successfully solve local social problems. Therefore, the student development processes in higher education institutions need to focus on fostering such capabilities in students (Cannon et al., 2026). A commitment to developing such human capital will lead to the creation of social entrepreneurial qualities, as well as opportunities for the emergence of social enterprises, which will be organizations capable of continuously solving social problems in the future (Garcia-Gonzalez & Ramirez-Montoya, 2021; Ghosh et al., 2024).

2.1.4. Smart Social Engineer

Social engineering is an approach to student development implemented by Thai Rajabhat Universities, aiming to equip students with the skills of social engineers. These skills encompass analytical and rational thinking, communication, teamwork, and social innovation. This approach seeks to enable students to apply their knowledge in real-world situations to solve community or societal problems in various dimensions, such as poverty, inequality, and quality of life issues (Sangarwut & Hemmanee, 2022). Developing social engineering skills through the use of appropriate tools, such as developing social engineering skills using geospatial information for area development, will help students understand and effectively apply them in community development and solve local community problems effectively (Ruethamrong, 2023). Previous research has suggested that a learning process focusing on practical training in communities should be implemented so that learners can learn and adapt social engineering tools in real-world situations. This will enhance learners' skills in problem-solving and community development effectively (Kongkoon, 2025). Previous research by Sangarwut and Hemmanee (2022) indicated that addressing social issues in local communities should build upon social engineering to create social innovations for sustainability by utilizing knowledge and creativity available in universities in the target community. Furthermore, Kongkoon's (2025) study suggests supporting activities or processes that allow community members to exchange knowledge and experience in the process of intelligent social engineering. Using the social engineering approach as a medium for learning stimulates practical learning and enables real-world and sustainable community development.

2.1.5. The Influences of Experiential Learning and Community Participation on Social Innovation

Experiential learning forms the basis of both individual and group learning, enabling learners to effectively connect theory with practical application. This leads to experimentation, problem-solving, and the exchange of knowledge and experience within groups, a continuous process that also fosters essential life skills for the future (Anwar, Suryajaya, & Suyidno, 2025; Bartels, 2023; U-senyang, 2024). Bartels' (2023) study found that experiential learning in collaborative groups, involving experimentation and the exchange of knowledge and experience,

contributes to sustainable social innovation. A study by Lapointe and Underdown (2022) on the educational structure that guides social science learners towards experiential learning in Canada found that having a foundation of knowledge and building experience through experiential learning, particularly through participation in managing social or community problems in areas of interest, contributes to constructive problem-solving and the development of social innovations to address social issues correctly. While the study by Yunfeng, Saad, and Yusuf (2022) highlighted the importance of experiential learning processes in influencing social entrepreneurship, this is a key characteristic linked to the development of social innovation to solve social problems and create economic impact simultaneously. This is consistent with the study by Cannon et al. (2026), which states that creating social innovation in modern education systems requires learners to construct learning experiences through hands-on work. Bartels (2023) suggested that policymakers should promote and support experiential learning as a key factor in fostering social innovation for successful long-term problem-solving. Therefore, the researcher hypothesizes the influence of experiential learning on social innovation as follows:

H1: Experiential learning significantly influences social innovation.

The outcomes of community participation processes through community-led learning have a positive impact on learner development in several aspects necessary for solving local or community problems. Such development enables learners to understand the social problems of their community and develop processes for finding creative solutions that can be applied in real life. Many of these solutions involve the development of social innovations that effectively solve local problems (Rittipakdee, Prateungthai, & Naruphai, 2025). Kato's (2025) study indicates that better solving complex problems may require community-based organizations developed through community participation, which would have greater resources and be better suited to developing creative solutions. Similarly, Bartels' (2023) study found that community involvement is crucial in promoting group learning processes that lead to hands-on experimentation in solving community social problems, ultimately resulting in the exchange of experiences and contributing to social innovation. Furthermore, the study by Appiah and Grimm (2024) also identified multi-organizational collaboration as a crucial factor in the development of current social innovations focused on social and environmental goals, as well as economic progress. The researcher's hypothesis on this issue is as follows:

H2: Community participation significantly influences social innovation.

2.1.6. The Influences of Experiential Learning, Community Participation, And Social Innovation on Smart Social Engineer

Social innovation is the application of novel ideas to create new forms of social relationships or collaborations in order to manage or respond to societal needs. It is a practice aimed at creating value within society or successfully solving societal problems (Repo & Matschoss, 2019). A study by Dawson and Daniel (2010) found that the development of social innovation is crucial for solving social problems through the thinking and decision-making processes of collaborative working groups with a shared goal of addressing social issues. The Appiah & Grimm study (2024) identifies social innovation as a process focused on solving social problems and creating value for society, thereby truly meeting those societal needs. In other words, the study provides a framework for using social innovation as a systematic approach to solving social problems, essentially employing a style of intelligent social engineering. Therefore, the researchers propose the following hypothesis for studying this issue:

H3: Social innovation significantly influences smart social engineer.

Experiential learning may refer to learning through hands-on experience. Such practice provides direct knowledge and experience that develops an individual's ability to solve problems effectively and manage challenges effectively, as well as preparing them for future work in a constantly changing environment (Shore & Dinning, 2023). A study by Lapointe and Underdown (2022) on experiential learning structures in Canada, focusing on social science learners, indicated that learning to build knowledge and experience through experiential learning, targeting social issues and involving participatory processes in addressing social or community problems of interest, can produce individuals with skills in creatively solving social problems and working effectively with local communities. The study of Shore and Dinning (2023) showed that learners who go through experiential learning acquire the knowledge, skills, and experience necessary to perform real-world tasks and solve problems. Certainly, the goal of developing social engineers in Thai universities is to cultivate

learners with the knowledge, skills, and experience to effectively solve social and community problems in their local areas. This is consistent with the study by Yunfeng, Saad, and Yusuf (2022), which found that developing skills in creative social problem-solving requires experiential learning, a crucial aspect of modern higher education. Therefore, the researchers developed hypotheses to study the relationship in this issue as follows:

H4: Experiential learning significantly influences smart social engineer.

The outcomes of community-based learning through community participation processes have developed learners in several important ways, including developing learners' understanding of environmental and social problems, leading to the search for sustainable solutions, and producing creative works that can be applied in real life. These outcomes result in learners developing critical thinking skills, creative problem-solving skills, social responsibility, and collaborative skills in solving local problems (Rittipakdee, Prateungthai, & Naruphai, 2025). The study by Teng et al. (2025) indicated that community involvement in learning development is akin to using a service-oriented learning model, which is highly beneficial in developing learners' deep understanding of society and community and ultimately enabling them to work towards finding solutions to community problems. Furthermore, Bartels' (2023) study provides the perspective that community involvement is crucial for creating individuals or groups who can sustainably solve community social problems. Therefore, the researchers propose the following hypothesis:

H5: Community participation significantly influences smart social engineer.

2.1.7. Social Innovation as the Mediating Factor of the Relationship Among Experiential Learning, Community Participation, And Smart Social Engineer

A review of the literature and previous research reveals a correlation between the key variables of this research: experiential learning, community participation, social innovation, and the development of social engineers. The researchers believe that social innovation is a crucial factor acting as a mediating variable between the relationships between experiential learning, community participation, and the development of social engineers. This is supported by Bartels' (2023) study, which found a link between experiential learning and the development of individuals capable of solving social problems or managing spatial issues in communities by linking the development of social innovation as a tool for solving such problems. This aligns with the findings of Yunfeng, Saad, and Yusuf's (2022) study, which found that experiential learning is important for the ability to develop social innovation to solve spatial problems, ultimately leading to the creation of individuals with social entrepreneurial qualities. Lapointe and Underdown's (2022) study also confirms this. Regarding the importance of community participation in solving spatial social problems, Bartels' (2023) study indicates that a strong perspective on community social participation is a vital factor for sustainable problem-solving, potentially requiring consideration at both individual and group levels in collaboratively studying and developing social innovation to address these issues. This aligns with the study by Appiah and Grimm (2024), which found that the involvement of diverse community organizations significantly contributes to the development of social innovations that lead to effective solutions to local social problems. This, in turn, creates individuals with the potential and skills to solve social problems, which is synonymous with the term "social engineer" used in the student development process of Thai Rajabhat universities.

The researcher's hypothesis on this issue is as follows:

H6: Social innovation plays a mediating role between experiential learning's relationship with smart social engineer.

H7: Social innovation plays a mediating role between community participation and smart social engineer.

2.2. Proposed Research Model

In constructing the conceptual framework for this research, the researcher reviewed the literature, concepts, theories, and previous research. The findings indicate that this research framework focuses on studying the interconnected relationships between four key variables: experiential learning, community participation, social innovation, and the development of social engineers, as shown in Figure 2.

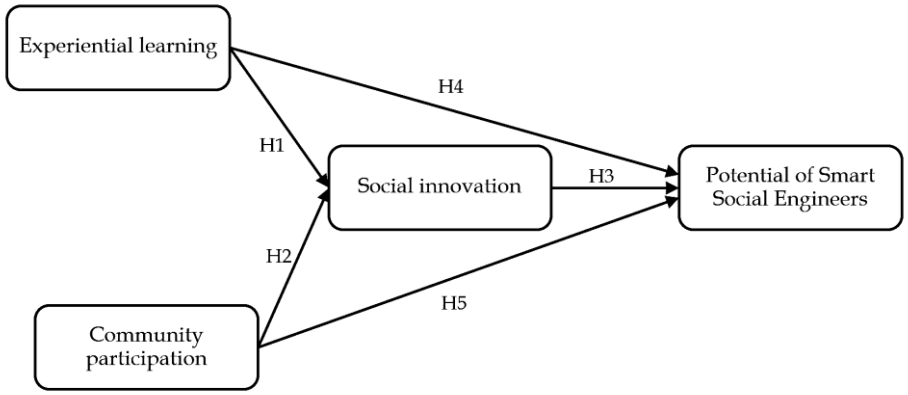

Figure 1: Proposed Research Model.

3. RESEARCH METHODOLOGY

3.1. Population And Sample

The population for this research consisted of 3,290 social engineers from 38 Rajabhat universities in Thailand (data as of 2025). This group comprised students, community leaders, lecturers, experts, administrators, and project coordinators from the universities. The sample size was calculated using Krejcie and Morgan's formula with a 95% confidence level and a 5% margin of error, resulting in a sample size of 342 individuals. Data was then collected using stratified random sampling, yielding 297 complete and ready-to-use questionnaires.

3.2. Research Questionnaire

For the research tools, the researchers reviewed the literature and previous research to create a conceptual framework and develop a questionnaire for data collection in this research. Initially, the questionnaire was evaluated for item objective congruence (IOC) by five experts. A value greater than 0.5 indicated that each question was consistent with the research objectives. The researchers will then proceed to test the reliability of the questionnaire in the next step. The questionnaire was developed from the references shown in Table 1. The researchers checked the reliability of the questionnaire using Cronbach's alpha statistics, where the criterion for considering reliability is that the alpha value must be greater than 0.7 (Hair, Black, Babin, & Anderson, 2014).

Table 1: Sources And Reliability of the Key Variables in the Questionnaire.

Variables	Items	Sources	Reliability
Experiential learning	20	Bartels (2023); Schreck, Weilbach, and Reitsma (2022); U-senyang (2024)	0.98
Community participation	20	Rittipakdee, Prateungthai, and Naruphai (2025); Zhang et al. (2023)	0.98
Social innovation	20	Appiah and Grimm (2024); Bartels (2023); Dawson and Daniel (2010)	0.98
Smart social engineer	20	Kongkoon (2025); Sangarwut and Hemmanee (2022)	0.98

The statistical analysis of the questionnaire's reliability, as shown in Table 1, reveals that all variables passed the reliability test. The alpha value of each variable was greater than 0.7, indicating that the research instrument is suitable for data collection in the next step.

3.3. Data Collection

For this research, the researcher used a stratified sampling method for the study population. Initially, the population was divided into four groups of social engineers: students, community leaders, lecturers and trainers, and coordinators and administrators. Data was then collected by sending online questionnaires to each group in quantities calculated using convenience sampling to meet the required sample size. The researcher received 297 completed questionnaires, which were checked for accuracy, completeness, and integrity. These questionnaires were then used for statistical analysis in the next step.

3.4. Data Analysis

The first part of the data analysis involves descriptive statistics related to the initial information of the respondents and the mean and standard deviation statistics of the key variables of this study. A preliminary evaluation of the mean criteria shows

that a mean of 4.5 to 5 is considered the highest level; 3.51 to 4.5 is high; 2.51 to 3.5 is medium; 1.51 to 2.5 is low; and 1 to 1.5 is the lowest level. The second part of the analysis is the structural equation modeling analysis, divided into two parts. The first part analyzes the measurement model of this study to test the observed and latent variables in the measurement model. The second part analyzes the structural model, proving the influence paths of the variables within the research framework, which will lead to the conclusion of the hypothesis of this study. In the initial assessment of the model using a fit index (Goodness-of-Fit index), the researchers used the following criteria: P value of Chi-square > 0.05, Chi-square/df < 2, GFI > 0.9, AGFI > 0.9, CFI > 0.9, TLI > 0.9, RMSEA < 0.05, and RMR < 0.08 (Sathyanarayana & Mohanasundaram, 2024). Once the model is deemed suitable, the researchers will then consider analyzing the influence pathways that align with the research framework in the final step.

4. RESULTS

In this section, the researchers will present their findings in three parts: descriptive statistical analysis, confirmatory analysis of the measurement model, and finally, structural model analysis to test the hypotheses in the structural equation model, or the conceptual framework of this study.

4.1. Descriptive Analysis

For the descriptive statistical analysis results, the researcher will present them in two parts. The first part, shown in Table 2, presents the results of the analysis of general information of the respondents. Table 3 shows the results of the analysis of the mean and standard deviation of the key variables of this study.

Table 2: General Analysis of the Respondents.

Variables		Frequencies	Percent
Gender	Male	106	35.7
	Female	191	64.3
Age	24 years old or below	212	71.4
	25 – 30 years old	2	0.7
	31 – 40 years old	30	10.1
	41 years old or above	53	17.8
Education	Below Bachelor's Degree	54	18.2
	Bachelor's Degree	158	53.2
	Master's Degree	67	22.6
	Doctorate Degree	18	6.0
Work experiences	Below 3 years	205	69.0
	3 – 5 years	22	7.4
	6 – 10 years	10	3.4
	11 years or above	60	20.2
Social Engineer-related status	Students	212	71.4
	Community leaders	12	4.0
	Advisors	61	20.6
	Administrators or Coordinators	12	4.0
Regions in Thailand	Northern part	39	13.0
	North-eastern part	177	59.6
	Central part	45	15.2
	Eastern part	10	3.4
	Western part	15	5.1
	Southern part	11	3.7

Table 2 shows that the majority of respondents were female (64.3%), and the largest group was under 25 years old (71.4%). Furthermore, the analysis revealed that the majority of respondents held a bachelor's degree (53.2%), followed by a master's degree (22.6%). Regarding work experience, the largest group (69%) had less than 3 years of experience, followed by those with 11 years or more (20.2%). Next, analyzing the significant status of social engineers, the largest group was students (71.4%), followed by consultants (20.6%) and community leaders, coordinators, and administrators (8%). Finally, analyzing the area of residence of respondents in Thailand, the majority were from the Northeast region (59.6%), followed by the Central region (15.2%), the Northern region (13%), the Western region (5.1%), the Southern region (3.7%), and the Eastern region (3.4%), respectively.

Table 3: Statistical Analysis of the Key Research Variables.

Variables	Means	Standard Deviation (SD)	Interpretation
Experiential learning	4.25	0.66	High level
Community participation	4.11	0.68	High level
Social innovation	4.06	0.68	High level
Smart social engineer	4.16	0.70	High level

Considering the economic analysis of the key variables shown in Table 3, it was found that, overall, the average scores of the four key research variables within the conceptual framework of the study were at a high level of opinion. The research results showed that experiential learning had an average score of 4.25 (SD = 0.66), community participation had an average score of 4.11 (SD = 0.68), social innovation had an average score of 4.06 (SD = 0.68), and smart social engineers had an average score of 4.16 (SD = 0.70). This analysis indicates that the level of opinion among respondents regarding these four key factors is high.

4.2. Measurement Model Analysis

The researchers began by testing the measurement model using statistical software to assess its initial goodness-of-fit indices. The analysis yielded the following goodness-of-fit values: Chi-square = 507.486 ($p < 0.001$), Chi-square/df = 5.178, GFI = 0.824, AGFI = 0.755, CFI = 0.934, TLI = 0.919, RMSEA = 0.119, and RMR = 0.017. Based on these results, the measurement model was deemed unsuitable. Therefore, the researchers adjusted the model using statistical software to optimize the measurement variables. The results of the adjustment yielded Chi-square = 128.680 ($p < 0.001$), Chi-square/df = 1.739, GFI = 0.952, AGFI = 0.912, CFI = 0.991, TLI = 0.986, RMSEA = 0.05, and RMR = 0.01. These adjustments demonstrate that the measurement model for this research project is suitable and meets the goodness-of-fit indices requirements (Sathyanarayana & Mohanasundaram, 2024). The results of the model adjustment analysis are shown in Figure 2.

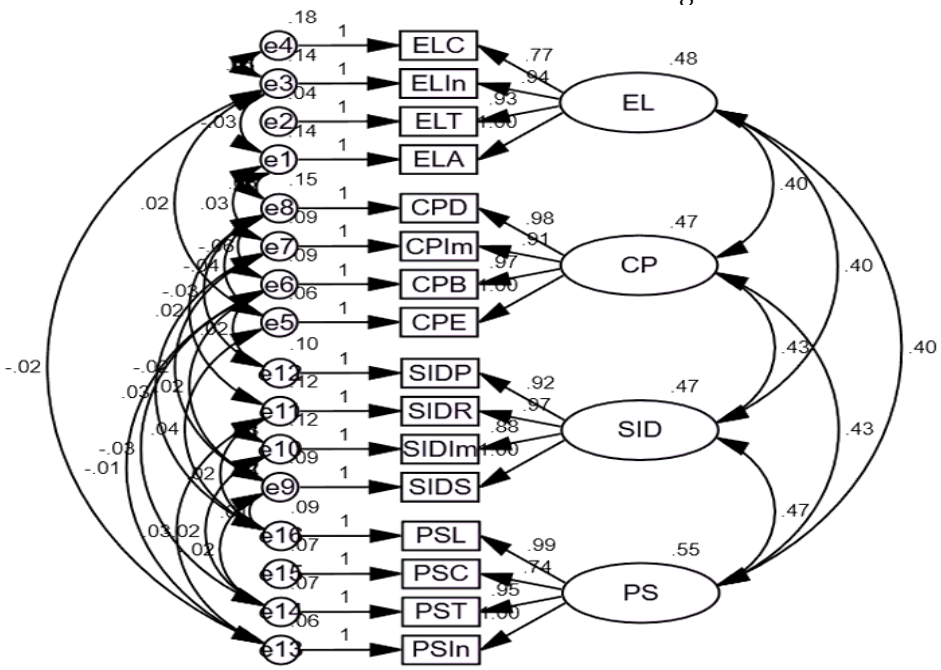

Figure 2: Result of The Measurement Model Analysis.

Table 4 presents the regression weight results of the measurement model and the significance level of the influence between latent and observed variables. From the results in Table 4, the analysis shows that the observed variables are suitable to be included with the latent variables, one at a time. This analysis confirms the suitability of the measurement model used in this research. The confidence derived from the analysis of the model fit index and the significance level showing the influence between observed and latent variables will affect the reliability of the structural model analysis in the next step.

Table 4: Regression Weights of Measurement Model.

Paths			Estimate	S.E.	C.R.	P
ELA	<---	EL	1			
ELT	<---	EL	0.934	0.037	25.319	<0.001
ELIn	<---	EL	0.942	0.049	19.259	<0.001
ELC	<---	EL	0.766	0.044	17.302	<0.001
CPE	<---	CP	1			
CPB	<---	CP	0.97	0.033	29.072	<0.001
CPIm	<---	CP	0.914	0.032	28.385	<0.001
CPD	<---	CP	0.984	0.046	21.175	<0.001
SIDS	<---	SID	1			
SIDIm	<---	SID	0.879	0.034	25.728	<0.001
SIDR	<---	SID	0.965	0.04	24.174	<0.001
SIDP	<---	SID	0.92	0.037	24.849	<0.001
PSIn	<---	PS	1			
PST	<---	PS	0.953	0.028	34.483	<0.001
PSC	<---	PS	0.744	0.025	29.76	<0.001
PSL	<---	PS	0.995	0.03	33.221	<0.001

4.3. Structural Model Analysis

In the final step, the researchers performed a structural equation modeling analysis. Initially, they considered the model's goodness-of-fit indices, similar to the evaluation of the measurement model. The preliminary analysis revealed that the model required adjustment because the goodness-of-fit indices did not meet the required criteria. The values were found to be the following: Chi-square = 815.675 ($p < 0.001$), Chi-square/df = 8.239, GFI = 0.783, AGFI = 0.702, CFI = 0.885, TLI = 0.860, RMSEA = 0.156, and RMR = 0.185. The researchers adjusted the structural model, resulting in goodness-of-fit indices that met the criteria as follows: Chi-square = 109.622 ($p = 0.003$), Chi-square/df = 1.523, GFI = 0.957, AGFI = 0.919, CFI = 0.994, TLI = 0.990, RMSEA = 0.042, and RMR = 0.011. These goodness-of-fit indices indicate that the structural model is suitable for further analysis of the path influence in the structural equation modeling in the next step.

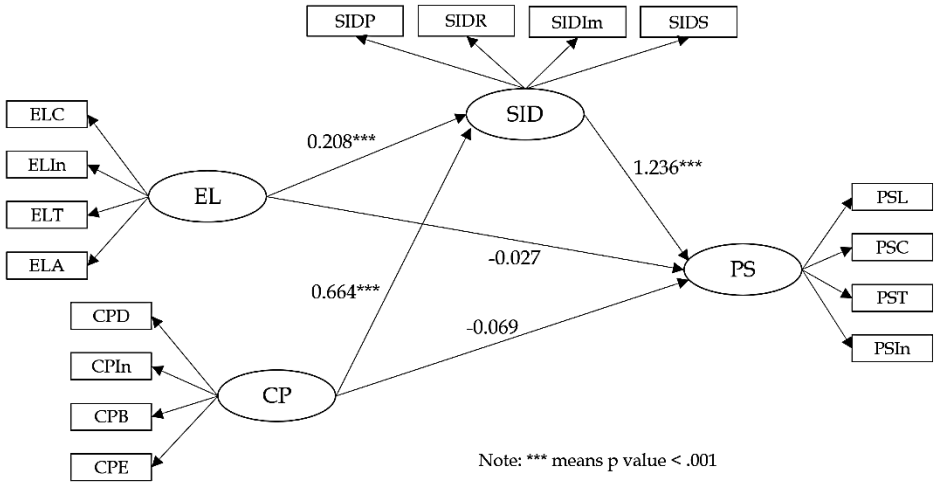

Figure 3: The Bootstrapping PLS-SEM Model.

The path influence analysis results of the key variables in the research are shown in Figure 3, Table 5, and Table 6. The path influence analysis between these variables is conducted within the conceptual framework of the research. From Figure 3 and Table 5, the analysis found that experiential learning has a significant influence on the development of social innovation, thus supporting hypothesis 1. The next analysis showed that community participation has a direct and significant influence on the development of social innovation, thus supporting hypothesis 2. As for hypothesis 3, which proves the influence of experiential learning on the potential of smart social engineers, the analysis rejected hypothesis 3. Similarly, the analysis rejected hypothesis 4, rejecting the influence of community participation on the potential of smart social engineers.

Table 5: Direct Effects of Structural Analysis.

Paths	Direct effects	t-value	P value	Hypothesis

Experiential learning -> Social innovation (H1)	0.208	3.858	<0.001	Supported
Community participation -> Social innovation (H2)	0.664	11.665	<0.001	Supported
Social innovation -> Smart social engineer (H3)	1.236	9.859	<0.001	Supported
Experiential learning -> Smart social engineer (H4)	-0.027	-0.423	0.672	Not Supported
Community participation -> Smart social engineer (H5)	-0.069	-0.650	0.516	Not Supported

Next, in hypothesis 5, the analysis found that the development of social innovations has a clear and statistically significant direct influence on the potential of smart social engineers. This analysis confirms that hypothesis 5 of the research is supported.

Table 6: Indirect Effects of Structural Analysis.

Paths	Coefficients	P value	Hypothesis
Experiential learning -> Social innovation -> Smart social engineer (H6)	0.258	<0.05	Supported
Community participation -> Social innovation -> Smart social engineer (H7)	0.821	<0.05	Supported

This analysis examines the indirect influence of social innovation as a mediating variable between experiential learning and smart social engineers. Table 6 confirms the indirect influence of social innovation on the influence of experiential learning on smart social engineers. The analysis confirms that hypothesis 6 of the research is supported. Finally, the analysis supports hypothesis 7, confirming that social innovation serves as a mediating variable in the relationship between community participation and the potential of smart social engineers.

Table 7: Coefficient Of Determination.

Constructs	Coefficient of determination (R^2)
Social innovation	0.857
Smart social engineer	0.826

Table 7 shows the coefficients of determination (R^2) to summarize the usefulness of the final research model. The analysis result found that social innovation had a coefficient of determination of 0.857. This means that the key variables, experiential learning and community participation, can explain 85.7% of the variance in social innovation development. Further analysis revealed that the potential of smart social engineers had a coefficient of determination of 0.826. This means that the three factors, experiential learning, community participation, and social innovation, can explain 82.6% of the variance in the smart social engineer variable.

5. DISCUSSION

This study aims to test the relationship between experiential learning, community participation, social innovation development, and the potential of smart social engineers, comprising seven hypotheses. The study confirms hypothesis 1, which finds that experiential learning has a significant influence on the social innovation of those who develop society by solving local problems. This finding agrees with the research by Cannon et al. (2026), which showed that hands-on experience is necessary for creating social innovation, and studies by Yunfeng, Saad, and Yusuf (2022) and Lapointe and Underdown (2022) highlighted how important experiential learning is in developing social innovation. This is part of building social entrepreneurship to solve community problems and create economic impact for the community, which is essential for fostering sustainable development and enhancing the overall well-being of the community. This also aligns with Bartels' (2023) study, which found that policies promoting and supporting experiential learning are a crucial factor in successfully developing social innovation that solves problems in the long term. The discussion highlighted the importance of various factors that influence the realization of social innovation. Social innovation arises from learning, experimenting, and adapting new concepts to address community problems and needs in real-world contexts. When learners continuously engage in fieldwork and interact with community members through participatory activities, it helps synthesize knowledge from experience, leading to the invention of new methods, products, or services that are appropriate for the area. Furthermore, the study found that community participation influences the development of social innovation, thus confirming hypothesis 2. The findings are consistent with Kato's (2025) study, which points out that creatively solving complex problems requires collaborative community involvement. It also aligns with Bartels' (2023) study, which found that community participation impacts group learning, potentially leading to community

problem-solving through the development of social innovation and proactive problem-solving. Furthermore, it aligns with the study of Appiah and Grimm (2024), which highlights the importance of diverse organizational participation in developing social innovation aimed at addressing social and environmental problems. This concept is consistent with Dewey's concept, who viewed learning as arising from the interaction between individuals and real-world situations in society, not merely from receiving knowledge in the classroom. Furthermore, it relates to the relationship between community participation and the development of social innovations to solve social problems. Such participation helps build trust among members, fosters constructive exchange of ideas, and facilitates the creation of effective solutions through collaborative problem-solving. Regarding hypothesis 3, the research clearly confirms that social innovation influences the potential of smart social engineers who work in the field to solve community problems. The findings are consistent with Dawson and Daniel's (2010) study, which found that the development of social innovation is crucial for solving social problems through thinking and decision-making processes by collaborative groups with a common goal of solving social problems. It is also consistent with the Appiah & Grimm study (2024), which indicated that social innovation is a process aimed at solving social problems and adding value to society to meet social and community needs. Social innovators develop social innovation by using creative thinking to solve social problems. These individuals play a crucial role in solving social problems and developing sustainable communities. This can be seen as vital for becoming social engineers within the context of regional or community development.

Next, the researchers will discuss the results of hypotheses 4 and 5, which consider the direct influence of experiential learning and community participation on the potential of intelligent social engineers. The analysis rejects both hypotheses. This means the study did not find any influence of experiential learning and community participation on the development of intelligent social engineers. This finding is inconsistent with previous studies, including the research by Lapointe and Underdown (2022), which demonstrated that experiential learning positively influences social development by producing individuals with skills in solving social problems and collaborating with local communities, as well as the study by Teng et al. (2025), which indicated that community involvement in learning development significantly enhances learners' understanding of society and community, enabling them to work towards solutions for social issues. This finding differs from previous studies, suggesting that, in the Thai context, relying solely on learning experiences and community participation is insufficient to create effective solutions to social and community problems. Other factors are needed to influence the development of problem-solving approaches and the development of individuals who can act as agents of change to truly address local community issues, such as access to resources, mentorship programs, and supportive policy frameworks that encourage active community engagement.

For hypothesis 6, which states that social innovation is an intermediary variable in the relationship between experiential learning and the creation of intelligent social engineers, this study confirms hypothesis 6. This aligns with Lapointe and Underdown's (2022) study, which found that social innovation is a significant factor in the influence of experiential learning on social development. The findings are consistent with Bartels' (2023) study, which found a link between experiential learning and the development of individuals capable of solving social problems or local issues in communities. This is achieved by linking the development of social innovation as a creative tool for solving such social problems. The findings are also consistent with Yunfeng, Saad, and Yusuf's (2022) study, which found that experiential learning is crucial for the ability to develop social innovation to solve local problems in communities, leading to the creation of individuals with the characteristics of social entrepreneurs to ultimately manage social issues. Finally, regarding hypothesis 7, which proves the influence of social innovation as an intermediary variable in the influence of social participation on intelligent social engineers, the research supports this hypothesis. This is consistent with Mr. A's study, which found that social innovation is a crucial factor in making community participation contribute to the creation of intelligent social engineers. This study's findings are consistent with Lapointe and Underdown's (2022) research, which affirms the importance of community participation in solving social problems, and with Bartels' (2023) research, which clearly indicates that social community involvement is a key factor in achieving sustainable solutions at the local level. This leads to collaborative community learning and the development of social innovations to address community problems. Furthermore, it aligns with Appiah and Grimm's

(2024) research, which found that the social involvement of various organizations is clearly beneficial for developing social innovations, leading to effective solutions to local community problems. This, in turn, contributes to the creation of individuals with the potential and skills to systematically solve social problems—or, as some might call them, "intelligent social engineers" according to the definition of the Thai Rajabhat University group.

In summary, the research findings can be clearly discussed and linked to conceptual frameworks and theories, especially the concepts of experiential learning, community participation, social innovation development, and the potential of smart social engineers, which have been developed and integrated into a final model in this research.

6. CONCLUSION AND RECOMMENDATION

6.1. Conclusion

Experiential learning and community participation have a statistically significant positive direct influence on the development of social innovation. This reflects that social innovation does not arise from individual learning alone but requires a participatory process involving stakeholders in the area. This facilitates knowledge exchange, joint decision-making, and the creation of solutions that are consistent with the real-world context of the community. Simultaneously, learning and participation alone may not be sufficient to enhance the capacity for analysis and problem-solving if they are not transformed into social innovations that can be practically applied to solve problems. Experiential learning serves as a crucial foundation for the learning process at the individual level. Such learning helps learners gain contextual understanding and identify problems and opportunities for community development from real-world situations. Community participation is a key condition that facilitates collaborative learning and development between individuals and the community. Learners play a role with local members through the exchange of ideas, joint decision-making, and practical social work. These factors lead to the development of social innovation, which acts as a key mechanism for enhancing the capacity of intelligent social engineers. In conclusion, developing social innovation, utilizing key factors such as experiential learning and community collaboration and participation in target areas, is crucial for solving specific social problems and fostering the smooth functioning of such societies or communities. This aims to reduce social inequality, improve quality of life, and ensure sustainable existence. Social innovation can be considered a vital component, acting as a catalyst for various inputs to cultivate individuals or groups who can act as "smart social engineers." These engineers will effectively address localized problems within the context of community and social development, ultimately achieving national strategic goals. The key new findings from this study are summarized in the final research model as shown in Figure 4 below.

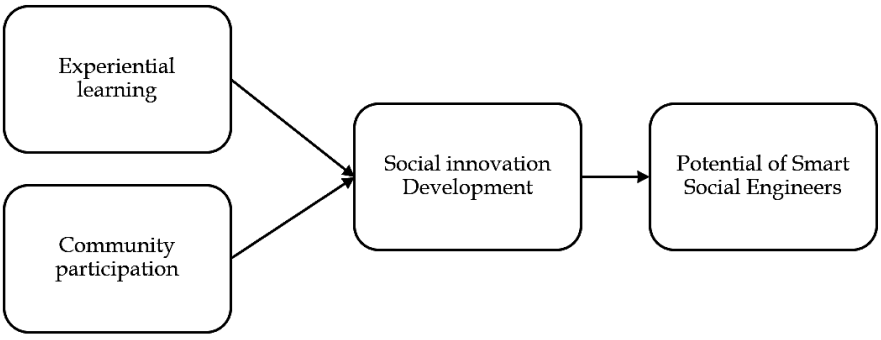

Figure 4: New Model Explaining Key Factors Affecting Social Innovation and Smart Social Engineers.

6.2. Recommendation

Regarding policy recommendations, educational institutions should establish policies that promote experiential learning in formats that connect problems to real-world community contexts. They should support educational institutions in working with communities as learning and personnel development partners in collaborative learning processes between communities and educational institutions. This will foster the development of tangible social innovations, ultimately leading to sustainable solutions to local community and social problems. Furthermore, institutions should have a human capital development policy that utilizes social innovation as a tool for solving local problems. This policy should focus on developing personnel involved in solving community and social issues

through social innovation processes or social entrepreneurship development. This will create individuals capable of truly and sustainably solving social problems – known as "smart social engineers." As for practical recommendations, the researchers suggest that educational institutions should design curricula or experiential learning activities that provide students with opportunities to engage in hands-on activities in community settings, from studying problems and analyzing them to collaboratively designing solutions. This includes studying problems, analyzing and collaboratively designing solutions, and testing and evaluating the effectiveness of learning and problem-solving. This aims to develop individuals' knowledge, skills, and attitudes, ultimately enabling them to become intelligent social engineers. Furthermore, the researchers recommend creating collaborative learning spaces with communities to facilitate knowledge exchange, teamwork, problem-solving experiences, and the development of social innovations to meet the specific needs of local communities. Finally, the researchers propose that educational institutions should have processes in place to develop the capabilities of teachers and staff, who, as contributors to creating new personnel, possess the capacity to develop students with experiential learning skills, group learning processes, and the ability to develop social innovations effectively addressing local community problems. This study was a cross-sectional study, which is a limitation of this research. Therefore, the researchers suggest that future research should include long-term studies to understand the impact of time on the results of various variables according to this research model. Furthermore, in-depth research using qualitative research methods should be considered to analyze and identify other factors that support the relationship between experiential learning and community participation, which ultimately contribute to the development of individuals capable of effectively solving social problems and enhancing social innovation.

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