Developing and Validating Life and Career Skills Indicators for Sustainable Devel-opment among Underprivileged Groups in Multicultural Southern Thailand

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Abstract

Amid globalization, workforce adaptability and life and career skills are essential for sustaining livelihoods and fostering inclusive development, particularly among underprivileged groups in rural, multicultural areas. This study aimed to identify, synthesize, and validate life and career skills indicators to strengthen workforce capacity. Using document synthesis, expert interviews, and structured questionnaires, data were gathered from 200 participants for pilot testing and 500 for empirical validation. Exploratory and Confirmatory Factor Analyses examined the construct validity of the proposed framework. Findings revealed that local livelihoods rely on three primary occupations—rice farming, fisheries, and toddy palm—reflecting ecological resources and cultural diversity. Out of twenty-one initial components, seven core components consisted of 14 indicators of life and career skills were identified: 1) Business Planning and Management 2) Emotion and Attitude Management 3) Communication and Technology 4) Problem Analysis and Decision-Making 5) Professional Knowledge and Expertise 6) Innovative Marketing 7) Leadership and Accountability. Factor analysis confirmed the seven-component model, explaining 78.61% of the variance. The model showed excellent fit (χ^2/df = 1.50, p = 0.998; GFI = 0.998; AGFI = 0.997; RMR = 0.028; RMSEA = 0.000), indicating an accurate representation of observed relationships. The findings highlight the importance of integrating traditional livelihoods with digital literacy, innovative thinking, and cross-cultural collaboration to improve resilience, adaptability, and employability. This study affirms that sustainable community development in multicultural contexts is contingent upon both the preservation of local heritage and the cultivation of modern competencies.

Keywords: Life Skills, Career Skills, Multiculturalism, Underprivileged Groups

Introduction

Globalization has accelerated societal transformation and intensified the flow of information, making national competitiveness increasingly important for sustainable development. As economies transition toward innovation-driven systems, the demand for a workforce equipped with both technical expertise and a broad range of life and career skills continues to increase (World Economic Forum, 2025). These skills—including adaptability, communication, creative thinking and lifelong learning—are essential for navigating labor market volatility and responding to rapid technological and social change. Conceptual frameworks such as the 21st century skills and UNESCO's (2021) notion of transversal competencies emphasized the integration of cognitive, emotional, and social abilities to strengthen individual resilience and long-term workforce development.

Despite the global recognition of these competencies, developing countries, including Thailand, continue to face challenges related to workforce productivity due to persistent skill gaps. These challenges are particularly evident among underprivileged rural populations, who often have limited access to education, stable income, and opportunities for skill development. Many individuals in these communities rely on traditional livelihoods while also confronting structural and economic constraints that hinder their ability to adapt to evolving labor markets. In Southeast Asia, recent studies emphasize that innovation capability and sustainable livelihoods are strengthened through collaborative learning, knowledge sharing, and community networks, which enable individuals to response more effectively to changing economic conditions (Jalotjot, H. C., Tokuda, H, 2024).

In southern Thailand, the multicultural context—characterized by diverse ethnic, religious, and linguistic groups—presents both challenges and opportunities for sustainable livelihood development. However, existing skill frameworks are largely derived from global or universal model and therefore lack specificity in addressing the unique socio-cultural and occupational contexts of local communities. Without such contextualization, skill development initiatives may fail to effectively support individuals in adapting to their socio-economic environments or in achieving sustainable livelihood outcomes.

Therefore, this study aims to develop and validate life and career skill indicators for underprivileged groups in multicultural southern Thailand. The study seeks to bridge global competency frameworks with localized knowledge by identifying skill dimensions that are both contextually relevant and practically applicable. In doing so, it contributes to the development of a more inclusive and culturally responsive framework that supports sustainable development and workforce resilience at the community level.

Research Objectives

1. To identify and synthesize life and career skills indicators of underprivileged groups in multicultural southern Thailand.
2. To validate life and career skills indicators of underprivileged groups in multicultural southern Thailand.

Literature Review

1. 21st Century Skills

The concept of 21st century skills has been widely discussed as a response to the transformation of modern economies toward knowledge-based and technology-driven systems. The UK policy document 21st Century Skills: Realizing Our Potential highlights that individuals are central to economic and social development, and emphasizes that skill formation should not only support employability but also promote personal fulfilment, lifelong learning, and social inclusion. (Kumbhakar & Kumar, 2025).

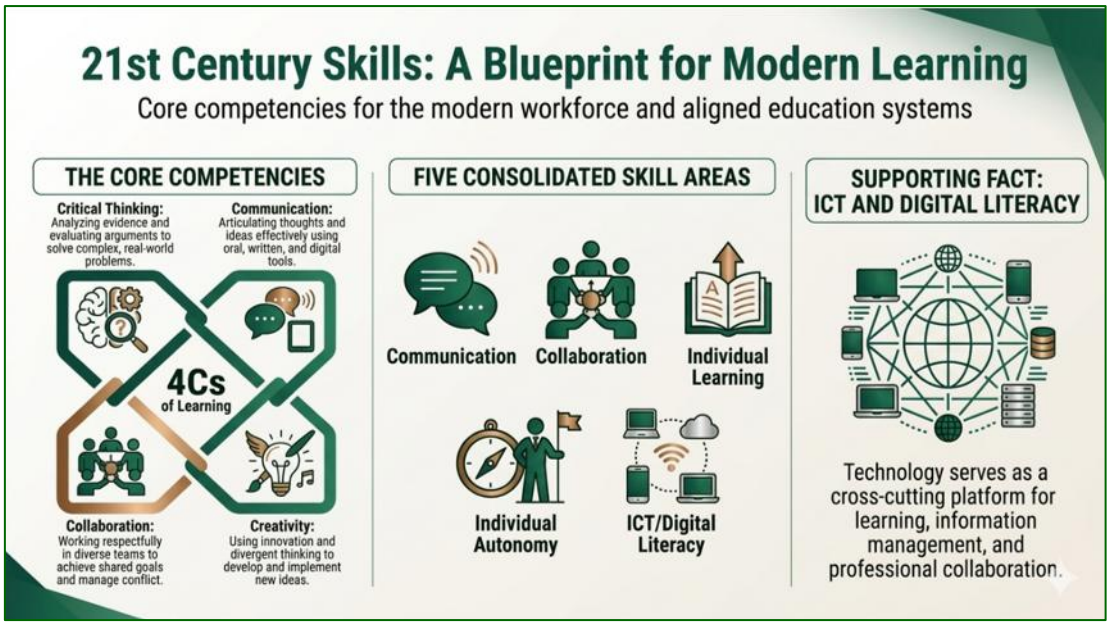

Figure 1 Core Competencies in 21st Century

As shown in the figure 1, Broader academic literature conceptualizes 21st century skills as a set of integrated competencies required to function effectively in complex environments. These include higher-order cognitive skills (e.g., critical thinking and problem-solving), interpersonal skills (e.g., communication and collaboration), and intrapersonal attributes (e.g., adaptability and self-directed learning) (National Academies). Frameworks such as the “4Cs” (critical thinking, communication, collaboration, and creativity), further consolidate these competencies into practical domains, often complemented by digital literacy as a cross-cutting skill essential for navigating information-rich and technology-mediated contexts. (Kumbhakar & Kumar, 2025)

2. Lifelong Learning Skills

Lifelong learning has become a central concept in the discourse on 21st century skills, particularly in response to rapid technological change, globalization, and evolving labor market demands. According to the International Labour Organization (2019), lifelong learning refers to a continuous process that encompasses formal, non-formal, and informal learning across the life course, integrating foundational, cognitive, social,

and job-specific skills. It is not limited to employability but also includes the development of capabilities necessary for active participation in society and personal development.

In addition, lifelong learning is increasingly viewed as a shared responsibility among governments, employers, and individuals. Effective systems require integrated policies that align education, training, and employment strategies, as well as active participation from social partners to ensure accessibility and relevance in diverse contexts International Labour Organization (2023) further underscores that lifelong learning enhances innovation, productivity, and resilience, enabling individuals and societies to thrive amid ongoing global transformations.

In summary, lifelong learning skills can be conceptualized as a dynamic and continuous set of competencies that support individuals in adapting to change, engaging in meaningful work, and participating fully in society. These skills integrate cognitive, social, and technical dimensions, with “learning to learn” serving as a foundational capability.

3. Sustainable Livelihoods Framework (SLF)

The Sustainable Livelihoods Framework (SLF) has been widely adopted as a comprehensive analytical tool for understanding how individuals and households sustain their living within complex and dynamic environments. The framework conceptualizes livelihoods as comprising the capabilities, assets, and activities required for a means of living, which are considered sustainable when they can cope with and recover from stresses and shocks without undermining future re-sources. (DFID, 1999 cited in Natarajan et al., 2022)

Central to the SLF is the interaction of five key components. First, the vulnerability context refers to external factors such as shocks, trends, and seasonality that influence people’s livelihoods but are largely beyond their control. Second, livelihood assets—often represented as the “asset pentagon”—include five forms of capital: human, natural, financial, social, and physical. Third, transforming structures and processes, including institutions, policies, and social norms, shape access to resources and opportunities. Fourth, individuals employ livelihood strategies, such as agricultural intensification, diversification, or migration, to achieve their goals. Finally, these strategies lead to livelihood outcomes, including income, well-being, food security, and sustainability. (International Labour Organization, 2020)

In recent literature, the SLF continues to be applied as a flexible framework for analyzing rural development, poverty reduction, and sustainability, particularly in developing countries. It provides a structured lens for examining how different forms of capital are combined and mediated by institutional factors to produce livelihood outcomes in diverse contexts.

Research Methodology

This study employed a mixed-methods, triangulation design: data transformation model transforming QUAL data into QUAN, exploratory approach that combined both quantitative and qualitative research methods.

The research process consisted of the following sequential steps:

1. Contextual Analysis: In-depth interviews and focus group discussions were conducted with community leaders, public representatives, and subject-matter experts to develop a thorough understanding of life and career skills within the local context. The qualitative data obtained from these engagements were systematically analyzed using content analysis, in which responses were transcribed, coded, and categorized into key themes and sub-themes reflecting essential life and career skills. The analytical process enabled the identification of recurring patterns, shared perspective, and context-specific competencies. In parallel, relevant literature and prior research were reviewed and synthesized to identify life and career skills aligned with future occupational needs. The findings from both the content analysis and literature synthesis were integrated to in-form the initial drafting of performance indicators.

2. Measures Development: A collaborative workshop involving experts, stakeholder representatives, and measurement specialists (n = 35) was held to create measures of life and career skills relevant to lifelong learning and future skill development. Afterward, experts were chosen based on their academic credentials or professional experience in educational measurement, evaluation, or research. According to these criteria, 15 experts evaluated the content validity of the measures using the Index of Item-Objective Congruence (IOC) for 0.74 – 1.00, along with assessments of accuracy, appropriateness, and feasibility. Necessary revisions were made following their recommendations.

3. Pilot Testing of Measures for Life and Career Skills: The 5 – point rating scales questionnaire, consisting of 72 items, was pilot-tested with 200 local participants. These participants were collected using stratified random sampling to evaluate the measure's initial reliability, which yielded a Cronbach's Alpha coefficient of 0.991. Based on these results, necessary modifications were made to improve the clarity and suitability of the items.

4. Indicator's validation: Following the pilot testing and revision process, the finalized life and career skill indicators underwent a quality assessment with different and larger samples of 500 local residents in Songkhla Province, southern Thailand. This group was independently selected using stratified random sampling and did not overlap with the pilot-testing participants. —167 involved in sugar palm-related work, 167 in rice farming, and 166 in fisheries. This distribution ensured that the sample reflected the region's diverse socio-economic contexts.

5. Data from these 500 participants were collected using stratified random sampling to ensure consistency between the theoretical constructs and empirical data. The criteria for selecting stakeholder representatives were as follows: participants were required to be residents of the local area, including government officials and community leaders in Sathing Phra District. Eligible individuals were engaged in occupations related to rice farming, fisheries, and toddy palm, and who expressed voluntary willingness to participate in the study. The measurement model, comprising 14 observed variables, 7 first-order latent factors, and 1 second-order latent factor, included 35 estimated parameters—covering factor loadings, error variances, latent variances, and co-variances among latent constructs. The total number of naïve parameters before model identification can be expressed as Kline (2023):

t_{naive} = p (loadings) + p (error variances) + m_1 (2^{nd}-order loadings) + m_1 (1^{st}-order residuals) + m_2 (2^{nd}-order variance)

However, this naïve parameter count does not consider the identification constraints needed to determine the scale of the latent factors. To ensure proper model identification, it is standard practice to either fix one loading per latent factor or set the variance of a latent factor to a predetermined value. As a result, the number of parameters that can actually be estimated (i.e., free parameters) is determined by subtracting the total number of latent factors from the naïve parameter count.

$t_{free} = t_{naive} - (m_1 + m_2)$

Following the guideline of at least 10 participants per parameter (Wolf et al., 2013), a minimum of 350 participants was required to ensure stable model estimation. The use of 500 participants exceed this threshold, providing sufficient statistical power and reliability.

Results

The results of this study are presented in two sections: (1) Identification and Synthesis of Life and Career Skills Indicators among Underprivileged Groups in Multicultural Southern Thailand. (2) Validation of Life and Career Skills Indicators among Underprivileged Groups in Multicultural Southern Thailand. The findings are communicated clearly and transparently, with relevant statistical analyses included to ensure rigor and reproducibility.

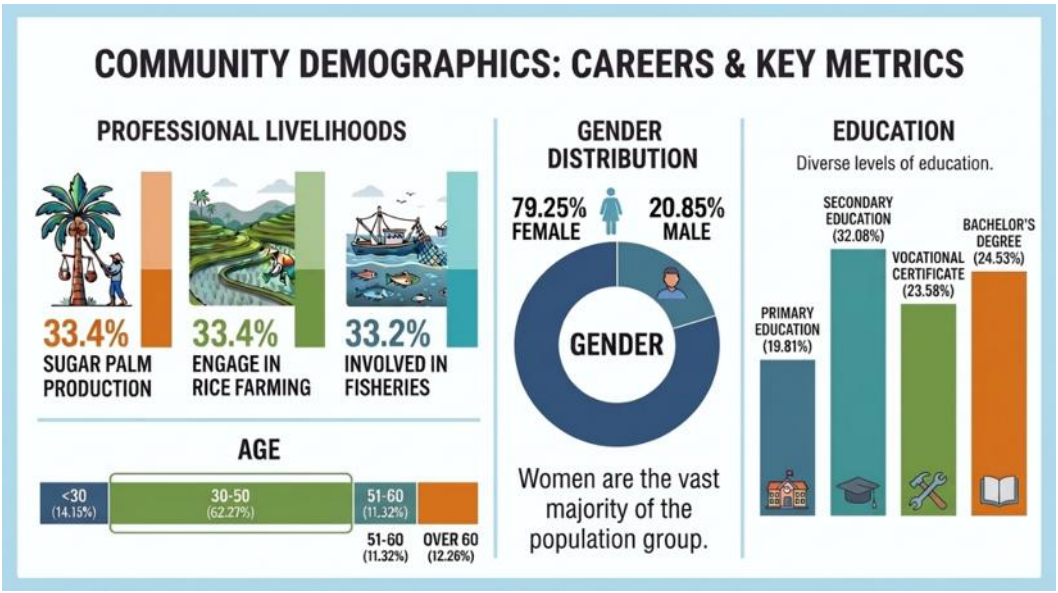

Figure 2 Demographic and Occupational Summary

The figure 2 has shown the data set demonstrates the demographic structure of a specific survey group, an equal third of the community is involved in the cultivation and processing of sugar palms, rice farming and fisheries. The primary working age group for over 62% is 30-50 years old, Secondary Education represents the largest educational achieved by 32.08% of the group.

1. Identification and Synthesis of Life and Career Skills Indicators among Underprivileged Groups in Multicultural Southern Thailand.

The data obtained from in-depth interviews with the District Community Development Officer of Sathing Phra District and a Senior Community Development Academic provided important insights into the primary occupations and ways of life of local residents within the Sathing Phra context. The findings revealed that the community's livelihoods can be broadly categorized into three main groups, locally referred to as "Nod–Na–Le" through the organization.

The first group, known as "Nod," comprises individuals engaged in occupations related to toddy palm. Their activities include both the sale of fresh products and value-added processing. These include food products (e.g., preserved palm fruit, palm sugar discs, liquid palm sugar, and powdered palm sugar) as well as non-food products derived from palm materials, such as handicrafts. While certain groups have achieved business success, others have encountered challenges due to limited knowledge of production processes and marketing constraints, often resulting in reliance on intermediaries.

The second group, referred to as "Na," consists of rice farmers. This group is clearly organized into two main clusters: the Tha Hin group, which cultivates the Sareh rice, and the large-scale farming group, which grows varieties such as Pathum Thani fragrant rice, RD15, Ai Chiang, and Kradangnga fragrant rice. Most farmers in this group sell their produce in an unprocessed form, typically as unmilled paddy rice immediately after harvest. As a result, they have limited bargaining power in the market.

The third group, known as "Le," includes coastal fishers. The majority sell their catch fresh, although some engage in basic processing methods such as drying, producing items like salted fish, anchovies, and dried shrimp.

Across all three occupational groups—Nod, Na, and Le—most practitioners are adults and elderly individuals. Community development officers noted that youth participation remains limited, as younger individuals are often either unavailable, uninterested, or residing outside the area. This trend raises concerns regarding the potential loss of local wisdom and the discontinuity of traditional knowledge transmission within the community.

The initiative components based on the synthesis of relevant documents and prior studies, together with expert opinions, the findings indicated that the life and career skills of residents in Sathing Phra District, Songkhla Province comprise 21 key components as follows (see table1):

Table 1 Initial Key Components of Life and Career Skills

Component		
(1) innovative thinking and adaptability	(8) self-assessment and understanding of individual differences	(15) management skills
(2) design thinking	(9) self- and interpersonal attitude adjustment	(16) sustainable development orientation
(3) social intelligence and cross-cultural learning skills	(10) transparency and accountability	(17) financial literacy
(4) perceptual acuity and interpretive ability	(11) leadership	(18) marketing skills
(5) rational decision-making	(12) production expertise	(19) communication skills
(6) analytical and situational evaluation skills	(13) interdisciplinary integration	(20) foreign language proficiency
(7) media literacy	(14) lifelong learning orientation	(21) networking skills

2. Validation of Life and Career Skills Indicators among Underprivileged Groups in Multicultural Southern Thailand.

To determine if the data is suitable for factor analysis, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were performed.

Table 2 KMO and Bartlett's Test.

Statistic	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.822
Bartlett's Test of Sphericity Approx. Chi-Square	89819.989
Df	2211
Sig.	0.000

Table 2 demonstrates the KMO value was 0.822, indicating a high level of sampling adequacy according to Kaiser's criteria (1974), where values above 0.80 are considered meritorious. Additionally, Bartlett's Test of Sphericity yielded a Chi-Square value of 89,819.989 (df = 2,211, p <0.001), indicating that the correlation matrix was not an identity matrix and that the variables were significantly correlated.

Principal Component extraction with Eigenvalues greater than 1.0 grouped the indicators into eight initial components. After axis rotation, the variance explained by each extracted component was adjusted.

Table 3 Total Variance Explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	42.03	62.73	62.73	42.03	62.73	62.73	17.05	25.45	25.45
2	2.95	4.40	67.13	2.95	4.40	67.13	10.94	16.33	41.78
3	2.11	3.15	70.27	2.11	3.15	70.27	7.68	11.46	53.24
4	1.81	2.71	72.98	1.81	2.71	72.98	7.58	11.31	64.55
5	1.43	2.13	75.11	1.43	2.13	75.11	4.57	6.82	71.36
6	1.37	2.04	77.15	1.37	2.04	77.15	2.47	3.69	75.05
7	1.19	1.78	78.93	1.19	1.78	78.93	2.39	3.56	78.61
8	1.16	1.73	80.66	1.16	1.73	80.66	1.37	2.05	80.66

As shown in Table 3, the principal component analysis conducted to identify the key underlying factors from a large set of raw data. The analysis extracted eight principal components, which collectively account for approximately 80.66% of the total variance, indicating a high level of explanatory power for the dataset. Examination of the eigenvalues shows that the first component is the most significant, explaining 62.73% of the variance, highlighting its dominant influence on the data structure. To enhance interpretability and achieve a more balanced distribution of variance across components, Varimax rotation was applied, facilitating clearer identification and meaningful interpretation of each factor.

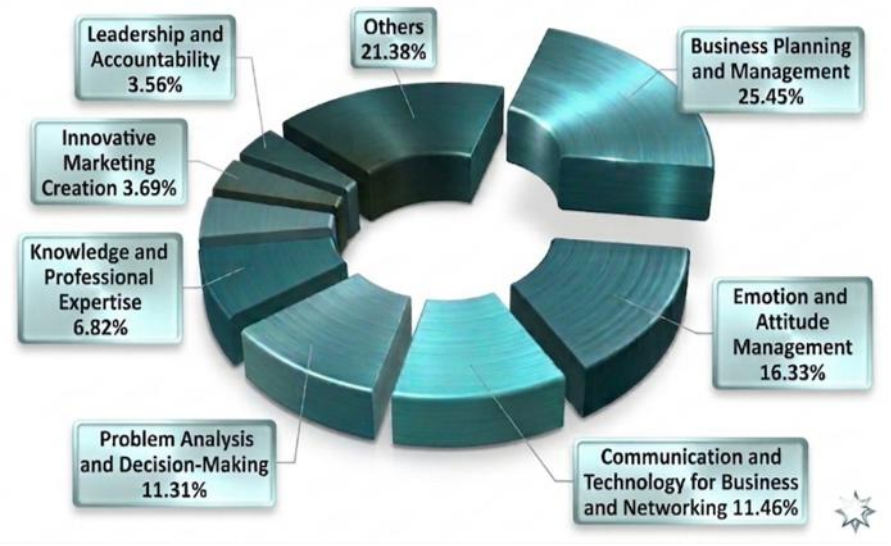

Figure 3 Percentage of Variance in the Components

As shown in Figure 3, with a threshold of 0.30 or higher was applied in accordance with Hair et al. (2018) for sample sizes exceeding 500 participants. The results indicate that Business Planning and Management (25.45%) emerges as the most significant component, followed by Emotion and Attitude Management (16.33%), indicating the central role of both managerial and psychological competencies in livelihood development. Communication and Technology for Business and Networking (11.46%) and Problem Analysis and Decision-Making (11.31%) contribute similarly, reflecting the growing importance of digital and cognitive skills. Knowledge and Professional Expertise (6.82%), Innovative Marketing Creation (3.69%), and Leadership and Accountability (3.56%) account for smaller yet meaningful proportions, representing more specialized and adaptive capabilities. Overall, the seven retained components explain 78.62% of the total variance, demonstrating strong explanatory power and underscoring the multidimensional nature of life and career skills in this context.

Table 4 Loadings per component.

Number of indicators per	Component						
component	1	2	3	4	5	6	7
1	0.73	0.80	0.73	0.72	0.70	0.75	0.62
2	0.72	0.76	0.73	0.72	0.67	0.73	0.59
3	0.66	0.67	0.72	0.64	0.66	0.73	0.59
4	0.66	0.64	0.67	0.63	0.65	0.70	0.55
5	0.66	0.64	0.62	0.58	0.61	0.63	0.49
6	0.58	0.64	0.60	0.54	0.57	0.61	
7	0.56	0.53	0.59	0.51	0.55		
8	0.55	0.50	0.58	0.51			
9	0.53						

As shown in the table 4, the analysis revealed nine components comprising of 51 indicators, with factor loadings ranging from 0.49 to 0.80. These values demonstrate acceptable to strong relationships between observed variables and their underlying constructs, factor loadings above 0.50 are practically significant and values approaching 0.70 or higher indicate strong associations (Hair et al. 2018). Among the components, the first component contained the highest number of indicators (9 indicators), while the second, third, and fourth components each consisted of 8 indicators. However, one indicator in the ninth component had a factor loading of 0.49, which is below the recommended threshold; therefore, this indicator did not meet the acceptable criteria and was excluded from further analysis. This distribution reflects a relatively balanced structure, with most components supported by an adequate number of indicators for meaningful interpretation.

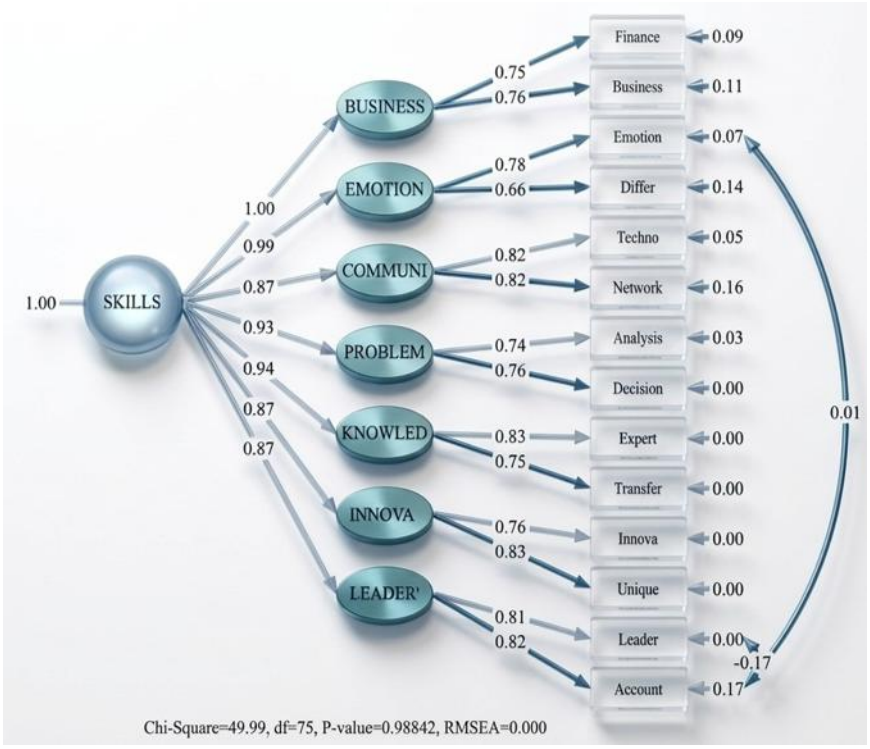

Figure 4 The Model of Components and Indicators of Life and Career Skills

The second-order confirmatory factor analysis (CFA) results indicate that the measurement model achieved an excellent fit with the empirical data. All fit indices met the recommended criteria, including a relative chi-square (χ^2/df) of 1.50 (below 2.00), a probability level (p) of 0.998 (greater than 0.05), a Goodness-of-Fit Index (GFI) of 0.998, and an Adjusted Goodness-of-Fit Index (AGFI) of 0.997 (both exceeding 0.90). Additionally, the Root Mean Square Residual (RMR) was 0.028 (below 0.05), and the Root Mean Square Error of Approximation (RMSEA) was 0.000, indicating an excellent level of model fit with the empirical data.

As shown in Figure 4, the latent construct of skills was represented by seven components. The factor loadings between the latent variable and its components ranged from 0.87 to 1.00, reflecting strong relationships and confirming that all components significantly contributed to the overall construct.

Furthermore, the factor loadings of the observed indicators ranged from 0.66 to 0.83, indicating acceptable to high levels of construct validity. All indicators met the minimum acceptable loading threshold of 0.30, confirming that each indicator was sufficiently related to its respective component and supporting the construct validity of the measurement model. In addition, most indicators demonstrated strong loadings (greater than 0.70), while a few remained within an acceptable range. The error terms associated with the indicators were relatively low, suggesting that the indicators were reliable measures of their respective latent constructs.

Overall, these findings confirm that the measurement model possesses strong construct validity and reliability, supporting the validity of the constructed indicators for evaluating life and career skills aimed at fostering lifelong learning and future skills among the population in southern Thailand.

The results of the factor analysis identified seven distinct components comprising a total of 14 indicators, representing key dimensions of life and career skills. **Component 1: Business Planning and Management** refers to the ability to systematically plan, organize, and manage business operations to achieve sustainable outcomes. It encompasses both strategic and personal dimensions of business performance. This component consists of two indicators: *(1.1) financial and marketing planning and management,* which refers to the capacity to plan, allocate, and manage financial resources and marketing activities effectively to ensure business viability and growth, and *(1.2) self-awareness and competency alignment,* which involves the ability to recognize one's own strengths and limitations, as well as those of others, and align tasks with competencies to enhance work performance and efficiency.

Component 2: Emotional and Attitudinal Management highlights the importance of regulating emotions and maintaining constructive attitudes in diverse social and professional contexts. This component consists of two indicators: *(2.1) emotional awareness and regulation,* the ability to perceive, understand, and manage one's emotions appropriately in work situations, and *(2.2) cross-cultural understanding*, emphasizing the capacity to recognize, respect, and effectively interact with individuals from diverse cultural backgrounds.

Component 3: Communication and Technology for Business and Networking captures the integration of communication skills and digital tools in supporting business activities and relationship building. It comprises two indicators: *(3.1) communication and technology utilization,* the ability to use language and digital tools to convey information, promote business activities, facilitate negotiation, and support conflict resolution through effective and conciliatory communication, and *(3.2) networking,* which involves the ability to establish, maintain, and expand professional and social connections for business opportunities.

Component 4: Problem Analysis and Decision-Making represents cognitive abilities related to identifying, analyzing, and solving problems in a systematic manner. It includes two indicators: *(4.1) information searching and problem identification,* the ability to gather relevant information and accurately define problems, and *(4.2) solution generation and decision-making,* reflecting the capacity to develop alternative solutions and make informed decisions based on analysis.

Component 5: Knowledge and Professional Expertise refers to the possession and application of domain-specific knowledge and skills in occupational contexts. It consists of two indicators: *(5.1) knowledge and professional skill,* the ability to apply specialized knowledge and technical skills effectively in one's profession, and *(5.2) knowledge and expertise transfer,* emphasizing the ability to share knowledge and skills with others, including the intergenerational transmission of knowledge to ensure continuity and sustainability of practices.

Component 6: Innovative Marketing Creation emphasizes creativity and innovation in developing and promoting products or services. It includes *(6.1) creative and design thinking,* the ability to generate new ideas and design innovative solutions, and *(6.2) differentiation and uniqueness development,* highlighting the ability to develop distinctive and unique products or services that establish a clear identity and competitive advantage in the market.

Finally, **Component 7: Leadership and Accountability** reflects the ability to lead others responsibly while maintaining ethical standards. This component comprises *(7.1) leadership*, the ability to guide, influence, and motivate others toward shared goals, and *(7.2) transparency and accountability*, emphasizing ethical conduct, responsibility, and the ability to guide others toward shared goals. Together, these components illustrate a comprehensive and multidimensional framework of skills essential for sustainable livelihood development.

Conclusion

1. Factor analysis identified that the indicators of life and career skills for promoting lifelong learning and enhancing future skills among the population in southern Thailand are organized into seven components, consisted of 14 indicators.

2. The research model demonstrated an excellent fit with the empirical data, considering all fit indices together, it can be concluded that the developed research model shows a strong alignment between the theoretical constructs and the empirical data, confirming the model's validity and robustness in representing the hypothesized structure.

Discussion

The findings of this study, which identify seven core components of life and career skills, provide a nuanced and contemporary understanding of human capital within the Sustainable Livelihood Framework (SLF). Skills such as business planning, emotional management, communication, problem-solving, and innovation illustrate a shift from traditional labor-based competencies toward more complex, adaptive capabilities required in rapidly evolving socio-economic contexts. This transition is consistent with 21st-century skills frameworks that emphasize the importance of cognitive, digital, and socio-emotional competencies for workforce readiness and sustainable development (World Economic Forum, 2025; Kumbhakar & Kumar, 2025).

These findings align with the SLF perspective that human capital—encompassing skills, knowledge, and competencies—plays a fundamental role in enabling individuals to transform available assets into viable livelihood strategies (Amin et al., 20225). Recent empirical studies reaffirm that human capital remains a critical determinant of livelihood outcomes, contributing significantly to income generation, social integration, and poverty reduction across diverse contexts (Du et al., 2025). This highlights the continued relevance of human capital in strengthening livelihood resilience and adaptability.

In particular, emerging literature highlights the importance of foundational and transferable skills as key components of human capital. These include literacy, digital competencies, and socio-emotional skills, which serve as essential building blocks for more advanced capabilities and long-term adaptability. Such skills enhance individuals' ability to respond to dynamic socio-economic and technological changes, thereby improving their capacity to transform available resources into sustainable livelihood strategies (Equitable Education Fund & World Bank, 2024). Furthermore, cross-cutting competencies—such as digital, self-reliant and life skills, and soft skills—are increasingly recognized as critical for participation in modern labor markets and sustainable development pathways.

Additionally, investments in skills development and training have been shown to significantly improve livelihood capital and resilience, particularly among rural and vulnerable populations (Sharma & Kaur, 2024). Within the SLF context, human capital interacts with other forms of capital—such as social, financial, and physical capital—to shape livelihood outcomes, reinforcing the framework's multidimensional perspective on poverty and development (Mensah & Addo, 2025).

Notably, the emergence of components such as "Innovative Marketing Creation" and "Communication and Technology for Business and Networking" indicates the integration of modern skill sets into traditional livelihoods, suggesting a hybridization between local knowledge and global competencies. This reflects the adaptive strategies described in the SLF, where individuals diversify and transform their livelihood activities to cope with external pressures and opportunities (Scoones, 2021). Such integration is particularly critical in rural and underprivileged contexts, where sustainability depends on the ability to balance tradition with innovation.

The strong empirical validity of the proposed model further supports the theoretical robustness of life and career skill. The alignment between the identified skill components and livelihood practices suggests that skills development should not be treated as a generic or universal construct, but rather as a context-specific capability system that directly supports livelihood strategies. This finding addresses a key limitation in existing frameworks, which often emphasize generalized competencies without adequately considering their applicability to local economic activities and cultural contexts.

Implication

Policy perspective implication

1. Policymakers should design localized training programs beyond resource-based interventions and incorporate culturally responsive skill development initiatives with modern competencies, particularly in areas such as digital marketing, financial literacy, and value-added production.

2. Education systems—especially in rural and multicultural regions—should adopt context-sensitive curricula that reflect local livelihood realities. This may involve embedding community-based learning, experiential education, and indigenous knowledge systems into formal and non-formal education frameworks.

3. Government and development agencies should promote inclusive innovation ecosystems by supporting small-scale producers with access to technology, markets, and capacity building resources.

Practical implication

1. Practitioners working in rural development and education should prioritize participatory approaches that actively engage community members in the co-creation of skill development programs. This ensures that interventions are not only contextually relevant but also socially accepted and sustainable.

2. The integration of digital tools into traditional livelihood practices should be facilitated through targeted training and infrastructure support, thereby enabling communities to enhance their economic resilience without eroding cultural identity.

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