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Teacher competency development in the digital age: promoting underprivileged students' vocational skills

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ABSTRACT

Vocational skills are essential for underprivileged students, providing practical job training that enables self-sufficiency, breaks the cycle of poverty, and improves job opportunities. The study addresses a critical gap, focusing on teacher competency for underprivileged students in urban communities of Chiang Mai, ethnic minority or stateless individuals, facing complex barriers to accessing fundamental rights and services. The concept of novel transdisciplinary research, comprising 10 vocational experts, 10 academic professionals from Chiang Mai-based universities, 35 school leaders and educators, and 261 parents, selected via purposive sampling. Data were collected through focus group discussions, field observations, workshops, and structured questionnaires, and were analyzed using descriptive statistics (mean, standard deviation) and qualitative content analysis. Public participation was crucial in developing guidelines for enhancing teacher competencies. The resulting framework consists of three components: challenges encountered by teachers; teacher development curriculum covering content, developmental approaches, and collaborative development networks; and development outcomes, including eight fundamental and eight specific outputs, and outcomes for improved student quality of life, competencies, and vocational skills across defined aspects. These guidelines provide a novel framework (outputs and outcomes) that integrates socio-legal knowledge and vocational training to sustainably improve the educational experiences and quality of life of this specific target group.

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1. INTRODUCTION

The United Nations sustainable development goals (SDGs) emphasize: i) no poverty: eradicating all forms of poverty in all areas; ii) good health and well-being: ensuring well-being and promoting good health for individuals of all ages; iii) reduced inequalities: reducing inequalities both within and across nations; and iv) peace, justice, and strong institutions: promoting a peaceful society where people have access to justice and establishing responsible institutions. These goals are particularly relevant for underprivileged children in urban communities, where digital literacy has become essential for sustainable learning and improved quality of life in this rapidly evolving era. According to the Thai education status report for the year 2017/2018 by the Independent Committee for Education Reform, an assessment of national and international test results such as Ordinary National Educational Test (O-NET), Programme for International Student Assessment

(PISA), and Trends in International Mathematics and Science Study (TIMSS) revealed challenges in student achievement. Specifically, average O-NET scores were below 50%, while the average PISA and TIMSS scores were significantly lower than those of neighboring countries [1]. Moreover, the PISA 2022 reported declines in mathematics and reading performance, while science scores remained statistically unchanged [2]. Overall, Thai students' average scores across all domains were lower than those of Organisation for Economic Co-operation and Development (OECD) member countries.

Despite the allocation of approximately 20% of Thailand's national budget to education, a significant number of students perform below minimum competency levels. PISA results categorized Thailand's overall educational outcomes at a "poor" level. Although there is a clear demand for "quality within diversity", decentralization of education remains restricted. Consequently, public schools encounter extensive administrative workloads, limiting teachers' time for classroom instruction. This challenge particularly affects underprivileged students, who require educational opportunities to develop their full potential, learn throughout their lives, contribute to society, and live harmoniously with others. According to Pornwiang *et al.* [3], underprivileged children are classified into 10 distinct groups; i) ultra-poor children; ii) children with drug problems; iii) abandoned children; iv) children subjected to abuse and violence; v) children affected by AIDS or serious contagious diseases stigmatized by society; vi) children from ethnic, multicultural, or stateless groups; vii) children of laborers; viii) children forced into labor or trafficking; ix) children involved in the sex industry, child prostitution, or at risk of such exploitation; and x) children with special needs. The researchers also recommended that these groups require urgent care and attention from school administrators and teachers, particularly within special school contexts [4]–[6].

Data from the Pa Daet Subdistrict Municipality, Mueang District, Chiang Mai Province [7], the urban community faces a concerning situation regarding socially underprivileged individuals, specifically underprivileged children in two schools for the academic year 2023 with a total of 537 students. These include: i) Wat Wang Sing Kham School, with a total of 293 students: 150 underprivileged students and 143 regular students; and ii) Wat Pa Daet School, with a total of 244 students: 174 underprivileged students and 70 regular students. These figures highlight the urgent need for educational approaches that align with students' diverse social, cultural, and legal contexts, particularly in relation to vocational and digital competency development. As part of the academic cooperation agreement signed on July 17, 2023, between Ban Pa Daet School, Wat Wang Sing Kham School, and the Center for Research on Inequality Reduction and Social Opportunity Advancement, collaboratively identified key problems, obstacles, and development needs within the Pa Daet Subdistrict [8], [9]. The discussions revealed that the high proportion of underprivileged students requires systematic, long-term solutions grounded in collaboration between schools, universities, and community partners.

Moreover, Pornwiang *et al.* [3] developed an innovative guideline for teachers that includes the following key principles: i) participation must be voluntary; ii) the content must align with job responsibilities; iii) activities should be selected based on individual readiness and personal passion; iv) development goals should be set in multiple dimensions, such as knowledge which individuals can learn independently and continuously; v) development goals should focus on key competencies, such as the digital skills of the participants what they should be able to do; vi) transdisciplinary integration content should be emphasized; vii) holistic evaluation should be conducted before, during, and after development using diverse methods; and viii) stakeholders must actively involve in the evaluation and reflection processes following development, differing from the traditional approach by focusing on curriculum, content, and development methods based on the needs of the employing agency, rather than the teachers' needs or issues teachers encounter.

Vocational skills are not only learning a trade for underprivileged children, but they are also a means of opportunity, hope, and a path to a better future. These initiatives assist them in escaping poverty, giving back to their communities, and developing self-reliance, living with dignity. Given the complexity of urban poverty and the specific challenges faced by children of ethnic/stateless groups, it shows the need for comprehensive research that bridges theory and practice in developing effective educational interventions for underprivileged children in urban Thai communities. Therefore, this study aims to conduct the professional development for teacher's competency by using a novel transdisciplinary research concept, known as participatory action research (PAR), which integrates expertise from five distinct fields (education, social sciences, health, agriculture, and marketing) by experts and specialists from universities in Chiang Mai with the principle of public participation from teacher training institutions, experts from various university faculties, school administrators, teachers, parents, and students. This process utilizes a working group of stakeholders in producing and developing teachers and related personnel with an emphasis on improving competencies in educational management to address issues faced by underprivileged children.

This public participation leads to a more comprehensive and multidimensional understanding of complex issues. Therefore, this study aims to design a teacher competency development curriculum using a transdisciplinary PAR approach, integrating expertise from education, social sciences, health, agriculture, and

marketing, while emphasizing public participation to improve both educational management and learning outcomes for underprivileged students. Through collaboration with entrepreneurs, researchers, and partner networks, we expect to generate new knowledge via social innovations. This initiative focuses on empowering underprivileged students by offering opportunities to earn income while studying, living independently based on their age and needs, and lowering educational inequality in urban communities as effectively as possible.

2. LITERATURE REVIEW

2.1. Guidelines for human resource development in education for the 21st century

Human resource development in 21st-century education reflects a gradual shift from traditional instructional models toward approaches that emphasize critical thinking, problem-solving, creativity, and innovation. This shift has been widely acknowledged in contemporary educational discourse; however, it requires more rigorous theoretical and empirical examination to ensure contextual relevance and practical feasibility. While recent research by Durongkaveroj [1], recognizes the necessity of transitioning from traditional educational approaches to contemporary frameworks. This emphasizes critical thinking, problem-solving, and innovation. This binary framework oversimplifies the intricate development of educational systems and may unintentionally overlook valuable elements of conventional teaching approaches. The growing emphasis on 21st-century skills-such as communication, collaboration, and the creative application of knowledge-has raised important concerns regarding implementation. Although these competencies are frequently promoted in policy and academic literature, empirical evidence supporting their effective application in disadvantaged educational settings remains limited. In addition, existing studies often fail to adequately address implementation challenges, particularly those related to teacher preparedness, institutional capacity, and unequal access to digital and learning resources. The Office of the Education Council of Thailand [10] similarly highlighted that without systematic capacity building and sustained professional support for teachers, human resource development policies risk remaining aspirational rather than leading to meaningful educational transformation.

2.2. Teacher competencies

The Office of the Education Council of Thailand is classified teacher competencies into two categories: i) threshold competencies, referring to the fundamental knowledge and skills necessary for performing complex tasks (speaking and writing competencies); and ii) differentiating competencies, referring to skills that enable individuals to achieve and exceed standards, are higher than expectations, and lead to different levels of success [10]. The Thai competency framework indicates that current literature does not clearly differentiate between fundamental communication skills (threshold competencies) and advanced communicative leadership that characterizes outstanding educators (differentiating competencies). This lack of distinction contributes to overly generalized professional development approaches that fail to address the full spectrum of teacher effectiveness.

2.3. Approaches for competency development

Pornwiang *et al.* [3] proposed a new approach to teacher competency development that emphasizes contextual relevance, professional autonomy, and participatory engagement. This framework outlines eight key principles designed to enhance the effectiveness and sustainability of teacher professional development. First, participation must be voluntary. Second, the content must align with the responsibilities of the participants. Third, participants should be able to select activities according to readiness and passion. Fourth, there should be structured development goals based on various dimensions, such as knowledge, being deeply knowledgeable in the core expertise, being aware of transdisciplinary aspects, being able to learn independently, and continuous knowledge-seeking. Fifth, development goals should focus on key competencies, such as the digital skills of the participants' expectations they are expected to accomplish. Sixth, emphasis of content should integrate transdisciplinary content. Seventh, a holistic evaluation (before, during, and after the development process) should be applied with various assessment methods. Lastly, stakeholders should participate in the evaluation and reflective feedback after the development.

2.4. Development of underprivileged students' vocational skills

The guidelines must pay attention to logical thinking and concepts related to career development among students aged 9–15. Effective vocational education at this stage emphasizes practical experiences that support both personal development and future employability. Previous studies have identified four complementary approaches to vocational skill development: i) proactive approach–engaging external organizations to promote and develop students' vocational and business skills by providing materials, equipment, and technology related to the students; ii) receptive approach–encouraging students to develop

products reflecting local identity; iii) adaptive approach–emphasizing the development of personnel to acquire knowledge in budget allocation in business, both online and offline; and iv) withdrawal approach–promoting the use of local identity and diverse community resources being as key selling points [11], [12].

2.5. Teacher competency development guidelines in the digital age promoting underprivileged students' vocational skills

The study on developing teacher competencies in the digital age to promote underprivileged students' vocational skills in schools identifies two groups of competencies: i) core competencies-such as goal-oriented performance, quality service, self-development, and teamwork; and ii) functional competencies-such as curriculum management, learning management, student development, and classroom management. The content relates to various dimensions in developing underprivileged students, including health, education, society, economy, environment, and arts and culture. The goal is to equip underprivileged students with necessary vocational skills and knowledge, enabling them to be employed, generates income, and become self-reliant. Thus, these approaches will lead them to a better quality of life, and the social inequality is reduced by developing knowledge gained from transdisciplinary research.

2.6. Conceptual framework

The study on the development of teachers' competencies in the digital era to promote vocational skills among underprivileged children in Pa Daet Subdistrict, Mueang District, Chiang Mai is based on in concepts derived from the constitution, national strategic plans, and government policies, all of which aim to expand educational opportunities and quality for underprivileged children facing complex challenges. The focus is on developing specific competencies for teachers who hold direct responsibility for understanding and addressing the issues confronted by these children. The development approach is based on a transdisciplinary research concept, as illustrated in Figure 1.

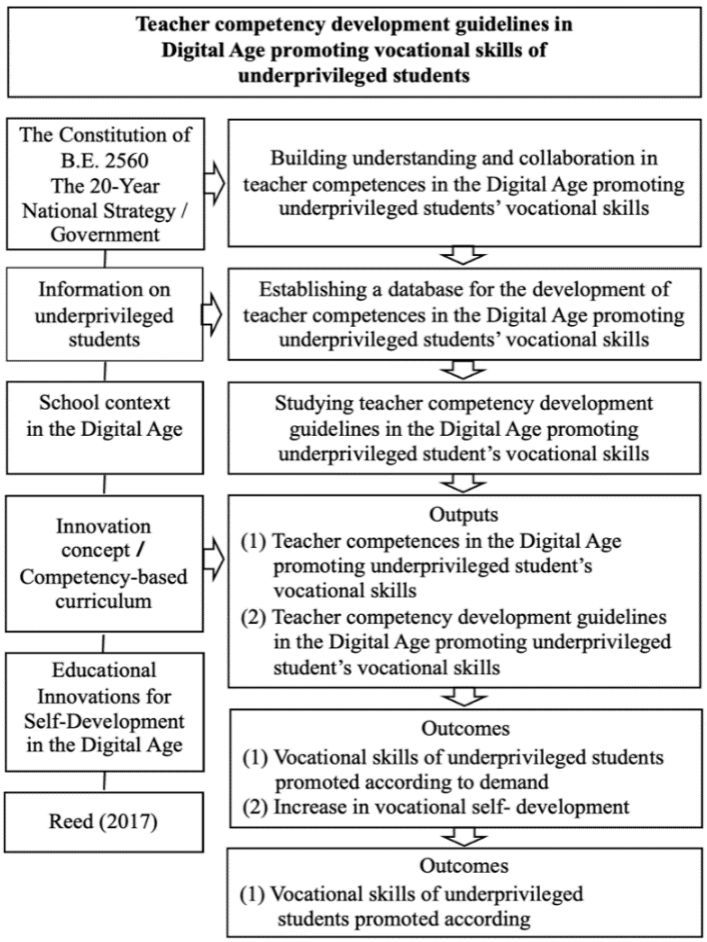

Figure 1. Teacher competency development guidelines in the digital age: promoting underprivileged students' vocational skills

3. METHOD

3.1. Phase 1: building understanding and collaboration

The first phase focused on fostering shared understanding and strengthening collaboration among stakeholders. The samples included 55 participants, selected through purposive sampling. They employed 35 school administrators and teachers from Wat Wang Sing Kham School and Wat Pa Daet School, and 10 educational experts from various institutions. Data were collected through two primary methods: structured surveys, which gathered standardized information on participants' perspectives regarding collaboration and teacher competency development needs, and focus group discussions, which provided in-depth insights into collaborative approaches among stakeholders. The research instruments consisted of standardized closed-ended questionnaires and Likert-scale items used to assess participants' attitudes, knowledge, and readiness for collaboration. In addition, semi-structured focus group guides with set topics and follow-up questions were used to encourage meaningful discussion. Data analysis was conducted using content analysis, involving the systematic examination of qualitative data from focus groups through thematic coding to identify recurring patterns, themes, and concepts related to understanding and collaboration.

3.2. Phase 2: establishing a database on the quality of life and underprivileged students in schools

The second phase focused on establishing a comprehensive database on the quality of life and underprivileged students in schools. It involved 306 participants selected through purposive sampling: 35 school administrators and teachers, 261 parents of underprivileged students from both target schools, and 10 university experts from Chiang Mai. Data collection utilized two primary methods: site visits along with direct observations and data collection at school locations for assessing physical conditions, resources, and contextual factors affecting student quality of life, and comprehensive surveys distributed to parents and school personnel to collect demographic and socioeconomic data. The research instruments included structured questionnaires covering demographic characteristics, socioeconomic indicators, and quality-of-life measures, along with standardized data recording forms for documenting site visit findings such as infrastructure, resource availability, and environmental conditions. Data analysis employed both quantitative and qualitative techniques: descriptive statistics (including means, central tendencies, and distribution patterns) to analyze survey data, and content analysis to examine observational records and open-ended responses, identifying themes related to challenges and opportunities in supporting underprivileged students.

3.3. Phase 3: establishing a database for the development of teacher competencies in the digital age

The third phase concentrated on establishing a database for the development of teacher competencies in the digital age particularly for promoting vocational skills among underprivileged students. This phase involved 35 participants purposively selected from both target schools: 21 administrators and teachers from Wat Wang Sing Kham School and 14 from Wat Pa Daet School. Data collection was conducted through two main methods: structured surveys and focus group discussions. The surveys emphasized digital skills, how teachers apply technology in teaching, and their ability to support vocational skill development. The focus group discussions were to explore teachers' real experiences, challenges, and needs in developing digital-age competencies. The research instruments comprised digital competency questionnaires, allowing teachers to evaluate their proficiency in using digital tools, online teaching, and integrating technology into vocational education. Structured focus group guides facilitated discussions on digital transformation challenges, training needs, and skill gaps. Data analysis employed content analysis. This involved organizing and coding the information from the focus groups to identify important themes, such as what digital skills are needed, what obstacles exist, and what practices support effective teacher development in the digital age.

3.4. Phase 4: studying teacher competency development guidelines in the digital age

The final phase aimed at studying and developing teacher competency development guidelines in the digital age for promoting underprivileged students' vocational skills. It comprised 55 participants who were selected through purposive sampling: 21 school stakeholders from Wat Wang Sing Kham School, 14 from Wat Pa Daet School, and 20 experts and specialists representing diverse fields including education, social work, health, agriculture, and marketing. Data collection was carried out by organizing interactive workshops designed to promote collaboration in developing, validating, and refining teacher competency development guidelines through expert insights and stakeholder input. These workshops enabled extensive discussion and integration of perspectives from multiple disciplines The research instruments included structured workshop documentation forms for systematically recording workshop discussions, expert recommendations, thematic points, and action plans. Data analysis utilized content analysis, involving comprehensive thematic examination of workshop proceedings to synthesize expert contributions, identify areas of convergence and divergence among stakeholders, and develop evidence-based teacher competency development guidelines that integrate multidisciplinary perspectives for effective implementation in urban school contexts.

4. RESULTS AND DISCUSSION

School administrators and teachers developed a better understanding of the various categories of underprivileged students and demonstrated a strong willingness to collaborate in developing their competencies for the digital age, with a focus on promoting vocational skills. Moreover, the research on the problem situation discovered that teachers lack knowledge about legal provisions concerning rights and freedoms according to the constitution of the Kingdom of Thailand, such as the rights to education, healthcare, and social welfare. The establishment of a database on student types, quality of life, and competencies indicated that the total number of underprivileged students was 537 students, classified into 213 general students and 324 underprivileged students. The research identified three common types of underprivileged students: 130 students from ethnic, multicultural, stateless groups; 109 ultra-poor children; and 38 children and descendants of laborers.

The quality of life assessment identified three primary challenges affecting the underprivileged students' quality of life are lack of Thai nationality or an identification card to access to rights and services provided by state, followed by primary family income earning from temporary or contract labor, and living in rented house. These challenges correspond with findings from site visits, which documented students' living conditions, quality-of-life concerns, and developmental needs. Most of these students live with a single parent, belong to ethnic minority groups, lack official nationality documentation, and have parents with irregular or unpredictable incomes. The results of the basic underprivileged students' competency assessment are presented in Table 1. It can be concluded that the results of basic underprivileged students' competency assessment showed that the overall competency level is low ($\bar{x}$=2.25). The lowest mean score is Thai language for communication, which is also at a low level ($\bar{x}$=2.44).

Table 1. Basic competency assessment of underprivileged students

Core competencies	$\bar{x}$	S.D.	Interpretation
1) Thai language for communication	2.44	0.22	Low
2) Mathematics in everyday life	2.26	0.08	Low
3) Scientific inquiry and scientific mind	2.18	0.1	Low
4) English for communication	2.13	0.08	Low
Total mean	2.25	0.07	Low

The results of the core underprivileged students' competency assessment are shown in Table 2. In summary, the assessment of the core underprivileged students' competencies indicated that the overall competency level is low ($\bar{x}$=2.36). The lowest average score is media, technology and digital literacy ($\bar{x}$=2.15). The results of teachers' competency assessment are shown in Table 3. In summary, the assessment results of teachers' competencies in school pointed out that the overall competency is at a high level ($\bar{x}$=3.32). The lowest mean score is digital technology and innovation utilization ($\bar{x}$=3.11). This research has differences from the traditional development approach, as demonstrated in Figure 2.

Table 2. Core competency assessment of underprivileged students

Core competencies	$\bar{x}$	S.D.	Interpretation
1) Life skills and safety	2.51	0.18	High
2) Financial literacy and entrepreneurship	2.17	0.16	Low
3) Higher-order thinking skills and innovation	2.18	0.12	Low
4) Media, technology and digital literacy	2.15	0.17	Low
5) Leadership and teamwork	2.44	0.17	Low
6) Ethical and global citizen	2.71	0.20	High
Total mean	2.36	0.03	Low

Table 3. Competency assessment of teacher in schools of Pa Daet Subdistrict, Muang District, Chiang Mai

Aspects	$\bar{x}$	S.D.	Interpretation
1) Teaching professionalism	3.78	0.08	Highest
2) Educational management skills	3.26	0.04	High
3) Digital technology and innovation utilization	3.11	0.15	High
4) Care for specific target groups of students	3.17	0.05	High
5) Curriculum design	3.29	0.11	High
6) Learning management design	3.28	0.09	High
7) Learning assessment and evaluation	3.39	0.04	High
8) Building relationships with communities	3.25	0.10	High
Total mean	3.32	0.04	High

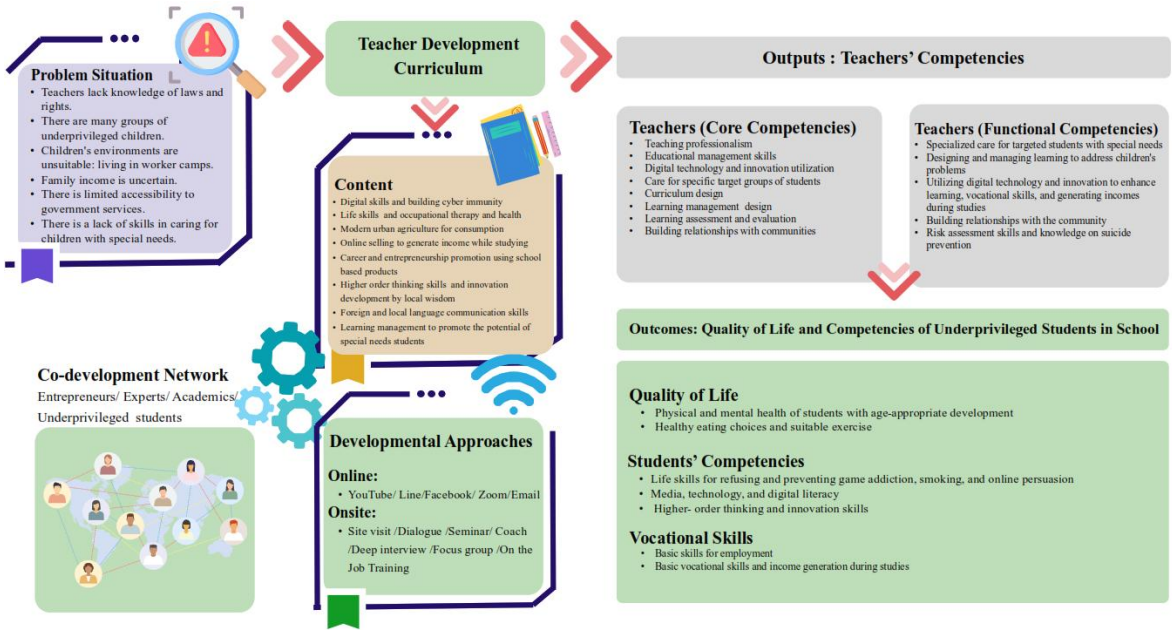

Figure 2. Teacher competency development guidelines in the digital age

The development of teacher competencies in the digital age represents a new guideline established analyzing complex problems and solutions from all stakeholders. This guideline extends beyond conventional educational knowledge, incorporating the application of multiple disciplinary insights contributed by experts through diverse methods. It consists of three key components: i) problem situation of teachers; ii) teacher development curriculum, which includes content, developmental approaches, and co-development network; and iii) development outcomes, comprising both outputs (competencies developed in teachers) and outcomes (enhanced quality of life, competencies, and vocational skills for underprivileged students).

Therefore, this guideline was developed through a PAR process that engaged stakeholders from all sectors of the community. This approach differs from traditional development models, particularly through its emphasis on collaborative development networks. The initiative also includes experts from various departments at Chiang Mai University, whose research and innovations are adapted to the specific needs and challenges of teachers in each area. It serves as a model for teacher competency development that can be applied by other educational institutions or agencies responsible for supporting teachers who work with underprivileged student populations.

4.1. Discussion

The findings on building understanding revealed that the school administrators and teachers have developed a deeper awareness of the different underprivileged student's types and are willing to collaborate in developing their competencies in the digital age, promoting the underprivileged students' vocational skills. Moreover, the research discovered that teachers lack sufficient knowledge about legal provisions concerning rights and freedoms according to the constitution of the kingdom of Thailand, such as the rights to education, healthcare, and social welfare. This represents a significant and unique gap in traditional teacher training for this specific context, attributed to the fact that most teachers hold a bachelor's degree in education and mainly teach within their specific subject areas. Consequently, their knowledge and understanding of health and social welfare may not consistent with the authentic challenges encountered by underprivileged students. This finding suggests that basic competency development alone is insufficient for this target group, demanding the inclusion of specialized socio-legal knowledge in teacher professional development curricula. This is in line with previous studies [13]–[16], which summarized that teacher development and training are essential, especially for those working with special needs students.

The database established on the types, quality of life, and competencies of underprivileged students revealed three critical problems: lack of Thai nationality or identification documents, dependence on temporary or contract-based family income, and residence in rented housing. These findings help explain the underlying causes and consequences faced by these students. Most underprivileged children in urban communities live with parents who are migrant laborers from ethnic minority groups, working in various

locations either legally or illegally. Despite this, Thailand mandates compulsory education for all children residing in the country. Consequently, these children are able to attend schools located near worker camps or rental communities.

The results of basic underprivileged students' competency assessment showed that the overall competency level is low, and the lowest mean score is Thai language for communication. According to the assessment of the core underprivileged students' competencies, it was revealed that the overall competency level is low, and the lowest average score is media, technology, and digital literacy. This result is critically interpreted through a cultural and organizational lens: most underprivileged children in urban communities are the children of migrant laborers who belong to ethnic groups and migrant workers, communicating in local dialects. Additionally, most of their families work as laborers and live-in poverty, which limit their access to media and technology. As a result, their ability to communicate in Thai and their digital literacy become barriers to learning. Therefore, the low scores reflect not just educational deficits but profound socio-economic and linguistic barriers inherent to this specific urban migrant context, highlighting the need for context-based educational interventions. This is in line with several findings [17]–[20]. Educational management for underprivileged students should focus on social and emotional skill development, effective classroom management, and active participation of parents and schools. The use of appropriate programs and methods can help these children develop the necessary skills for sustainable success.

The findings in establishing a database to develop teachers' competencies presented that the overall competency is at a high level, and the lowest mean score is the aspect of digital technology and innovation utilization. Organizationally, this trend is likely due to the significant administrative workload public school teachers face, limiting their time for advanced innovation mastery. However, due to the rapid advancement of digital media, technology, and innovation, along with the heavy workload teachers are already responsible for, they have limited available time for self-development or learning new innovations. Consequently, their ability to adapt to rapidly changing media, technology, and innovations is constrained.

The findings consist of a problem situation related to the quality of life and the competencies desired for underprivileged students. The development guidelines are divided into three parts. Part 1: problem situation establishes the foundational context for the initiative. Part 2: teacher development curriculum is structured through three sub-components: i) content, focusing on digital skills and building cyber immunity, life skills and occupational therapy and health, modern urban agriculture for consumption, online selling to generate income during studies, career and entrepreneurship promotion using school-based products, higher-order thinking skills and innovation development by local wisdom, foreign and local language communication skills, and learning management to promote the potential of special needs students; ii) developmental approaches, utilizing online and onsite modalities through specialized curriculum design, knowledge dissemination, practical training, and follow-up on progress; and iii) co-development network. Part 3: development outcomes comprises: i) outputs (competencies to be developed in the teacher), which include eight fundamental and eight specific competencies, and ii) outcomes (quality of life, competencies, and vocational skills promoting underprivileged students), consisting of improving quality of life in two aspects, competencies in three aspects, and vocational skills in two aspects. These will empower underprivileged students to develop to reach their full potential. This is consistent with the findings in previous studies [21]–[24], which recommend that teacher development for underprivileged students should emphasize improving language skills, vocational training, a strengths-based approach, and improving knowledge of child learning processes. These elements enable teachers to create a supportive learning environment to foster children's development. Furthermore, implementing these approaches represents a new operational method, regarded as community innovation, which will contribute to an area-based and local economy [25]–[27]. This integration of collaboration between schools, networks, and communities strengthens sustainable development [28]–[33].

4.2. Theoretical and practical implications

This research encompasses multiple interrelated theoretical frameworks and practical applications aimed at addressing the complex educational requirements of disadvantaged children in urban areas. It also relies on recommendations for human resource development in education for the 21st century, highlighting the necessity for adaptable, technology-infused strategies to equip educators for modern challenges. Central to this framework is vocational skill development for underprivileged children, recognizing that practical, career-oriented education serves as a critical pathway for breaking cycles of poverty and social exclusion. Moreover, it includes competency development guidelines for teachers adapted to the digital era, focusing on how educators can improve disadvantaged students' vocational skills using technology-based teaching methods effectively. The theoretical basis is advanced through the idea of transdisciplinary research, encouraging the merging of educational insights from social sciences, health, agriculture, and marketing fields to create holistic solutions. This approach is complemented by the concept of public participation to

ensure that all stakeholders-including teachers, administrators, parents, students, and community members actively contribute to the educational development process. The framework also employs educational management approaches that address cultural diversity, acknowledging the specific needs of the ten categories of disadvantaged children identified in the study. This research aligns with educational management principles that reinforce the SDGs, particularly in relation to poverty reduction, equitable education, social inclusion, and the promotion of peaceful, resilient communities. Importantly, it ensures that educational interventions contribute to broader social transformation and continuous community advancement.

5. CONCLUSION

This study introduces a new concept for developing teachers' competencies in target areas aligned with the authentic problems faced by underprivileged students in urban communities. This study provides a significant theoretical contribution by demonstrating the efficacy of the transdisciplinary PAR model for solving complex educational problems that single-discipline methods cannot address. This novel integration of knowledge from education, social sciences, health, agriculture, and marketing, achieved through active public participation, is crucial for supporting the SDGs, promoting lifelong learning, and personal growth. The development guidelines are divided into three parts: problem situation, teacher development curriculum, and development outcomes. These outputs include eight fundamental and eight specific teacher competencies. The outcomes consist of improving quality of life (two aspects), competencies (three aspects), and vocational skills (two aspects). These will enable underprivileged students to fully develop their potential.

Therefore, the distinctiveness of this developing teacher competency guideline is an innovative concept, which differs from traditional teacher development approaches. This concept applies educational sciences to solve the complex problems underprivileged children face. These traditional approaches often rely on a single disciplinary perspective, which may not achieve sustainable solutions. The key practical implication is the co-production of knowledge and the use of context-based learning modules, (community tourism management or urban agricultural processing) where teachers act as co-teachers, collaborating with experts from both private and social sectors. This ensures the guidelines are aligned with reality and leads to practical implementation, fostering a sense of ownership among stakeholders. The developmental guidelines aligned with reality and this leads to practical implementation.

The conclusion of this guideline leading to the authentic educational contexts is to transform abstract concepts into measurably tangible outcomes. Policy recommendations derived from this research include: i) mandating specialized teacher training in socio-legal aspects (rights, welfare, and statelessness issues) for educators working with specific target groups; and ii) utilizing the PAR model as a blueprint for area-based teacher development to eliminate poverty and advance quality education. For vocational skills, students can earn income while studying from the developed vocational skills or develop product/service prototypes for commercial potential to collaborate with local entrepreneurs. The entire process is based on an intensive transdisciplinary research framework. It is implemented by developing the context-based learning modules (e.g., community tourism management or urban agricultural processing). Teachers acted as co-teachers, collaborating with experts from both private and social sectors, applying real-life problems as learning platforms. Significantly, the establishment of sustainable mechanisms is implemented through a teacher's manual and the creation of a teacher development network to lead to ownership among stakeholders. For future research direction, this collaborative model should be expanded into a learning ecosystem, followed by longitudinal studies to track student outcomes using frameworks such as Happy Thais and Smart Thais over a 3-5-year period. It can integrate schools, communities, and entrepreneurs, and these can promote effective underprivileged students' vocational skills in the future.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

The data that support the findings of this research are available from the corresponding author, [SP], upon reasonable request.

REFERENCES

[1] W. Durongkaveroj, "Recent developments in basic education in Thailand: issues and challenges," *SSRN Electronic Journal*, 2022, doi: 10.2139/ssrn.4204181.

[2] The National PISA Center, "Press conference on the results of the PISA 2022 assessment," 2023. [Online]. Available: https://pisathailand.ipst.ac.th/news-21/.

[3] S. Pornwiang, M. Manokarn, and T. Thongngok, "Guidelines for improving educational personnel competencies in the digital age to elevate the quality of life and underprivileged children competencies in urban communities, Chiang Mai Province," *Journal of Law and Sustainable Development*, vol. 11, no. 12, pp. 1–27, Dec. 2023, doi: 10.55908/sdgs.v11i12.1995.

[4] A. F. Gilmour and L. E. Sandilos, "The crucial role of administrators in shaping working conditions for teachers of students with EBD," *Journal of Emotional and Behavioral Disorders*, vol. 31, no. 2, pp. 109–119, 2023, doi: 10.1177/10634266221149933.

[5] U. Nisa, A. Zain, and A. Rahmah, "The role of shadow teachers for supporting learning assistance on children with special needs in inclusive early childhood education," *Journal of Islamic Education Students (JIES)*, vol. 4, no. 1, pp. 32–42, May 2024, doi: 10.31958/jies.v4i1.12298.

[6] M. Doikou, "Promoting social and emotional learning in pupils with disability. Special teachers' perceptions and practices," *International Journal of Emotional Education*, vol. 16, no. 1, pp. 154–168, Apr. 2024, doi: 10.56300/IYZP5999.

[7] Pa Daet Sub-district Municipality, "Local development plan (A.D. 2023-2027)," (in Thai), Strategy and Budget Division, Chiang Mai, Thailand, 2021, pp. 4–8. [Online]. Available: https://www.padad.go.th/v/document/129

[8] H. Hautala and H. Lehti, "Children's perceived economic disadvantage and social relationships in school: family relationships as a mediating factor," *Child Indicators Research*, vol. 18, no. 1, pp. 295–318, Feb. 2025, doi: 10.1007/s12187-024-10192-9.

[9] J. R. Badger *et al.*, "Associations between school-level disadvantage, bullying involvement and children's mental health," *Children*, vol. 10, no. 12, p. 1852, Nov. 2023, doi: 10.3390/children10121852.

[10] B. Alan, "Determining generic teacher competencies: a measurable and observable teacher competency framework," *International Journal of Psychology and Educational Studies*, vol. 9, no. 2, pp. 308–331, 2022, doi: 10.52380/ijpes.2022.9.2.472.

[11] K. K. Dutta and V. Talegaonkar, "Evolving pedagogy model in teacher and teaching-learning process for the education of underprivileged children: a journey of skill development initiative at NGO activity center," *Towards Excellence*, vol. 14, no. 3, pp. 494–511, Sep. 2022, doi: 10.37867/te140348.

[12] T. D. D. A. Ningtyas, B. Budiyanto, and S. J. Andajani, "Development of vocational skills for mild mentally retarded children on making bags from Batik cloth at the SMALB level," in *Proceeding of International Conference on Special Education in South East Asia Region*, May 2024, pp. 59–65, doi: 10.57142/picsar.v1i1.28.

[13] J. L. Brown *et al.*, "Direct and moderating impacts of the CARE mindfulness-based professional learning program for teachers on children's academic and social-emotional outcomes," *Applied Developmental Science*, vol. 29, no. 1, pp. 14–33, Jan. 2025, doi: 10.1080/10888691.2023.2268327.

[14] I. Thompson, *Tackling social disadvantage through teacher education*. London: Routledge, 2025, doi: 10.4324/9781041057239.

[15] A. M. Lema and D. Mngarah, "Fostering disadvantaged children's social development through interactive reading aloud," *Language Teaching and Educational Research*, vol. 7, no. 2, pp. 107–121, Dec. 2024, doi: 10.35207/later.1466883.

[16] A. Anees, "Teacher education for early childhood care and education," *EPRA International Journal of Multidisciplinary Research (IJMR)*, vol. 10, no. 2, pp. 378–380, Feb. 2024, doi: 10.36713/epra15863.

[17] N. Bhattrai, "Addressing educational inequities in urban slums: a narrative review," *International Research Journal of MMC*, vol. 5, no. 5, pp. 123–132, Dec. 2024, doi: 10.3126/irjmmc.v5i5.73702.

[18] S. J. Niu, H. Niemi, and B. Furman, "Supporting K-12 students to learn social-emotional and self-management skills for their sustainable growth with the solution-focused kids' skills method," *Sustainability*, vol. 14, no. 13, 2022, doi: 10.3390/su14137947.

[19] Y. Liu, M. Xiong, R. Mo, L. Song, and J. Liu, "Parental involvement and children's positive and negative emotion: The mediating role of academic stress," *Journal of Advances in Humanities Research*, vol. 2, no. 2, pp. 86–97, Apr. 2023.

[20] S. Khuhro and A. Khuhro, "Educational support provision offered to children belonging to disadvantaged communities," *Spry Contemporary Educational Practices*, vol. 2, no. 2, pp. 146–169, Jul. 2023, doi: 10.62681/sprypublishers.scep/2/2/2.

[21] L. Darling-Hammond, A. C. W. Schachner, S. K. Wojcikiewicz, and L. Flook, "Educating teachers to enact the science of learning and development," *Applied Developmental Science*, vol. 28, no. 1, 2024, doi: 10.1080/10888691.2022.2130506.

[22] J. T. Downer *et al.*, "Coaching and coursework focused on teacher–child interactions during language/literacy instruction: effects on teacher outcomes and children's classroom engagement," *Early Education and Development*, vol. 35, no. 5, pp. 1032–1062, Jul. 2024, doi: 10.1080/10409289.2024.2303604.
[23] N. K. Ozdemir, N. B. A. Kayabol, G. Aydın, and C. E. Tatlı, "Fostering teachers' career education competencies: test of a training programme," *British Journal of Guidance and Counselling*, vol. 50, no. 3, pp. 462–473, May 2022, doi: 10.1080/03069885.2022.2031883.
[24] R. P. Pertiwi, S. E. K. Dewi, and R. A. Abdulwahab, "Learning management of children with special needs in the era of limited face-to-face learning in inclusion elementary school," *JIP Jurnal Ilmiah PGMI*, vol. 8, no. 2, pp. 117–129, Jan. 2022, doi: 10.19109/jip.v8i2.13819.
[25] P. I. Rahmatullah, M. Akhyar, and A. Efendi, "Enhancing high school students' problem-solving skills through digital module integration," *JTP - Jurnal Teknologi Pendidikan*, vol. 27, no. 1, pp. 245–259, Apr. 2025, doi: 10.21009/jtp.v27i1.53496.
[26] F. F. Amanda, S. B. Sumitro, S. R. Lestari, and Ibrohim, "Enhancing critical thinking and problem solving skills by complexity science-problem based learning model," *Multidisciplinary Journal of Educational Research*, vol. 14, no. 1, pp. 96–114, Dec. 2024, doi: 10.17583/remie.9409.
[27] S. Mahmudah, T. Kirana, and Y. S. Rahayu, "Profile of students' critical thinking ability: implementation of e-modul based on problem-based learning," *IJORER: International Journal of Recent Educational Research*, vol. 3, no. 4, pp. 478–488, Jul. 2022, doi: 10.46245/ijorer.v3i4.231.
[28] M. Khasawneh, "Social attitude of children with special needs in the learning process," *Medical Archives*, vol. 77, no. 2, pp. 149–153, 2023, doi: 10.5455/medarh.2023.77.149-153.
[29] E. Lagoudaki, Z. Gareiou, and E. Zervas, "Comparative review of the application of education for sustainable development in secondary education in Europe," in *E3S Web of Conferences*, Nov. 2024, p. 04007, doi: 10.1051/e3sconf/202458504007.
[30] H. L. W. Pan and W. Y. Chen, "Networked learning communities in promoting teachers' receptivity to change: how professional learning beliefs and behaviors mediate," *Sustainability*, vol. 15, no. 3, p. 2396, Jan. 2023, doi: 10.3390/su15032396.
[31] H. Perlman, A. S. Bryk, and J. L. Russell, "Measuring educators' perceived benefits of participation in educational improvement networks," *Peabody Journal of Education*, vol. 100, no. 1, pp. 82–99, Jan. 2025, doi: 10.1080/0161956X.2025.2444844.
[32] M. X. P. Ortega, S. C. Ojeda, M. C. Sandoval, L. A. R. Rodríguez, and F. C. Gómez, "Learning ecosystem: designing an inclusive space to enhance the higher education process," *International Journal of Changes in Education*, vol. 2, no. 2, pp. 104–114, Feb. 2025, doi: 10.47852/bonviewijce52024054.
[33] Y. Li, "Research on the resource integration model of the home-school-community collaborative education ecosystem," *Frontiers in Science and Engineering*, vol. 5, no. 5, pp. 68–79, May 2025, doi: 10.54691/fza9wh47.

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