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หัวข้อที่ต้องการฝึกอบรมในรูปแบบบทเรียนอิเล็กทรอนิกส์ของครูพลศึกษาไทย: การศึกษาเปรียบเทียบตามประสบการณ์การทำงาน

E-LEARNING TRAINING TOPIC NEEDS FOR THAI PHYSICAL EDUCATION TEACHERS: A COMPARATIVE STUDY ACROSS WORK EXPERIENCES

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อสำรวจหัวข้อที่ครูพลศึกษาต้องการฝึกอบรมในรูปแบบบทเรียนอิเล็กทรอนิกส์ รวมทั้งเปรียบเทียบความต้องการดังกล่าวจำแนกตามประสบการณ์การทำงาน โดยปัญหาการวิจัยในครั้งนี้ คือ ข้อจำกัดในการพัฒนาวิชาชีพครูพลศึกษาในประเทศไทยส่วนใหญ่เป็นการฝึกอบรมแบบหน้าต่อหน้า (Face-to-face) เป็นหลัก แต่ระบบการเรียนรู้เพื่อพัฒนาวิชาชีพแบบออนไลน์หรือรูปแบบบทเรียนอิเล็กทรอนิกส์ที่สามารถเข้าถึงได้ทุกที่ทุกเวลายังมีอยู่อย่างจำกัด ประกอบกับการขาดซึ่งข้อมูลเกี่ยวกับความสนใจของครูพลศึกษาในการต่อยอดพัฒนาหลักสูตรอบรมต่าง ๆ ให้ตรงกับความต้องการที่แท้จริงของครูพลศึกษา การวิจัยนี้ใช้ระเบียบวิธีวิจัยเชิงสำรวจ โดยเก็บรวบรวมข้อมูลจากครูพลศึกษาจำนวน 448 คน จาก 7 ภูมิภาคทั่วประเทศไทยด้วยวิธีการสุ่มตัวอย่างแบบหลายขั้นตอน เครื่องมือที่ใช้ในการวิจัย คือ แบบสอบถามที่ผ่านการตรวจความตรงเชิงเนื้อหาจากผู้ทรงคุณวุฒิและตรวจสอบความเชื่อมั่น จำนวน 103 ข้อ (มีค่าสัมประสิทธิ์ครอนบาคแอลฟาเท่ากับ α = 0.87) วิเคราะห์ข้อมูลโดยการใช้สถิติเชิงพรรณนา การจัดอันดับ และการวิเคราะห์เชิงเนื้อหาเพื่อเปรียบเทียบหัวข้อที่มีความต้องการที่แตกต่างกัน 5 ลำดับแรก จำแนกตามประสบการณ์การทำงาน ผลการวิจัยพบว่า หัวข้อที่มีความต้องการมากที่สุด ได้แก่ การพัฒนาหลักสูตรวิชาพลศึกษา การจัดกิจกรรมกีฬาสีในสถานศึกษา แนวทางการวัดและประเมินผล หลักการผู้ฝึกสอนกีฬา และวิธีจัดการเรียนรู้เฉพาะทางกีฬา ประเด็นสำคัญ คือ ผลการวิเคราะห์เปรียบเทียบเผยให้เห็นถึงการเปลี่ยนแปลงของลำดับความสำคัญตามประสบการณ์ทำงานของกลุ่มตัวอย่าง โดยครูพลศึกษาที่มีประสบการณ์การสอน 1–20 ปี ให้ความสำคัญเป็นลำดับแรกเกี่ยวกับการพัฒนาหลักสูตรพลศึกษาและงานด้านการบริหารจัดการ ในทางตรงกันข้าม ครูพลศึกษาที่มีประสบการณ์การสอนตั้งแต่ 21 ปีขึ้นไป ให้ความสนใจในการฝึกอบรมในหัวข้อที่เกี่ยวข้องกับเนื้อหาทางวิทยาศาสตร์การกีฬา ข้อค้นพบเชิงประจักษ์นี้สะท้อนให้เห็นว่าหัวข้อความต้องการพัฒนาวิชาชีพมีพลวัตที่แปรเปลี่ยนตามประสบการณ์ทำงาน ข้อสรุปจากการศึกษาวิจัยนี้ชี้ให้เห็นว่า หน่วยงานภาครัฐและผู้กำหนดนโยบายที่เกี่ยวข้อง จำเป็นต้องปรับเปลี่ยนกระบวนทัศน์การฝึกอบรมรูปแบบเดิม ไปสู่การขับเคลื่อนการพัฒนาบทเรียนอิเล็กทรอนิกส์ ที่เนื้อหาสาระจำแนกตามประสบการณ์ทำงานและความต้องการ โดยสามารถเข้าถึงได้ทุกที่ทุกเวลา เพื่อไม่รบกวนเวลาสำหรับครูผู้สอนในระยะเริ่มแรกและระยะกลาง ควบคู่กับการสร้างแรงจูงใจในการมอบใบประกาศนียบัตรดิจิทัลเฉพาะทางด้านวิทยาศาสตร์การกีฬาขั้นสูง สำหรับครูผู้สอนอาวุโสที่มีความสนใจในด้านนี้ เพื่อบรรเทาภาวะหมดไฟในวิชาชีพครู

คำสำคัญ: หัวข้อที่ต้องการฝึกอบรม, บทเรียนอิเล็กทรอนิกส์, ครูพลศึกษา

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Abstract

This study investigated the prioritized e-learning training topics demanded by physical education (PE) teachers and compared these preferences across distinct career stages to address the limitations of conventional face-to-face professional development in Thailand. A survey research design was employed, collecting data from 448 PE teachers across seven Thai regions selected through multi-stage sampling. The research instrument was a validated 103-item questionnaire, demonstrating high internal consistency (α = 0.87). Data were analyzed using descriptive statistics, ranking, and content analysis. The findings revealed a high collective demand for topics spanning PE curriculum development, school sports day organization, measurement and evaluation, sports coaching, and sports-specific instruction. Crucially, a comparative analysis across career stages uncovered a noticeable difference in priority rankings based on teaching experience. Early-to-mid career educators (1–20 years) prioritized baseline pedagogical architecture and heavy administrative demands, particularly school sports day organization. Conversely, late-career educators (21+ years) exhibited a pedagogical saturation, shifting sharply toward specialized sports science, muscle-strengthening instruction, and athletic fitness conditioning. These empirical insights underscore the multi-role burdens imposed on Thai PE teachers and demonstrate that professional needs systematically evolve rather than remain static. The study concludes that relevant state authorities must abandon one-size-fits-all training in favor of a Differentiated Career Lifecycle E-Learning Framework—integrating asynchronous digital buffering for novice teachers and advanced scientific micro-credentials for senior educators—to mitigate teacher burnout, optimize systemic efficiency, and safeguard classroom instructional quality and student learning outcomes.

Keywords: Training topic needs, E-learning, Physical education teachers

Introduction

Electronic learning, commonly referred to as e-learning, is a form of digital education that uses online technologies to reduce constraints related to time and location. Through web-based platforms, learners are able to define their own learning goals and progress according to their individual pace and preferences (Office of Trade Competition Commission, 2023; Abusamra et al., 2025; Encarnacion et al., 2021). Over the past two decades, e-learning has expanded rapidly. Industry data indicate growth of approximately 900 percent compared with twenty years ago (Mani, 2023), reflecting a substantial shift in how education is delivered. In many contexts, traditional classroom instruction in schools and universities has increasingly been supplemented or replaced by online systems. These systems allow learners to access content at any time and from any location, while also providing opportunities to review complex material repeatedly and regulate their own learning pace (Bashir & Lapshun, 2025).

Despite this global expansion, evidence from selected online platforms suggests a trend where physical education and sports science e-learning courses are relatively limited compared to other academic fields. SkillLane (2025) reports that among 4,400 available e-learning courses, only 20 focus on sports, exercise, or physical education teacher development, accounting for just 0.45 percent of total offerings. Similarly, Futureskill (2025) indicates that no courses in these specific areas are currently available on its platform. At present, professional development for physical education teachers in Thailand is delivered primarily through programs organized by sports associations under the Sports Authority of Thailand and the Department of Physical Education. Participation is restricted by limited enrollment capacity, and the number of sessions offered each year does not correspond to the nationwide demand. According to data from the

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Department of Physical Education, only 33 training sessions were organized in 2023, and these did not cover all regions of the country (Department of Physical Education, 2024). Furthermore, the content of these programs mainly emphasizes sports coaching, officiating, and recreational leadership, and all sessions are conducted in face-to-face formats.

This situation contrasts with developments in several other countries. In the United States, the National Federation of State High School Associations provides more than 46 fully online courses related to coaching and officiating, allowing educators to participate at their convenience (National Federation of State High School Associations, 2024). In the United Kingdom, universities have also expanded short-term professional training opportunities; for example, Loughborough University offers more than 15 short courses in related areas (Loughborough University, 2024). Internationally, the use of e-learning for the professional development of sports personnel has grown considerably, particularly following the COVID-19 pandemic, which accelerated the shift away from in-person training (Mani, 2023).

When designing e-learning programs or short training courses, it is essential to begin with a clear understanding of baseline conditions and stakeholder needs. Needs analysis ensures that course content corresponds directly to learners' expectations and professional demands (Aldoobie, 2015). For this reason, the present study employed a survey research design to examine which training topics Thai physical education teachers wish to pursue through an e-learning format. The objective was to generate foundational data reflecting teachers' current interests in order to inform the development of future online programs.

The survey instrument was constructed based on core components of school physical education and physical activity programs. These components were synthesized from SHAPE America guidelines and adapted to the Thai educational context (SHAPE America, 2023; Sa-edi, 2011). The training topics were grouped into five principal domains: curriculum, instruction, assessment, and instructional development; organization of school activities and sports competitions; interschool sports competitions and athlete development; physical education for students with special needs; and sports clubs, recreation, and physical activity promotion.

This study aims to investigate and prioritize the primary e-learning topics for professional development preferred by Thai physical education teachers, evaluating their specific training needs by highlighting the ten topics with the highest mean scores. Additionally, it compares these expressed e-learning needs across various career stages based on years of teaching experience. Ultimately, the findings furnish actionable recommendations to government departments and universities to shape e-learning materials that are responsive to actual professional necessity and contemporary expectations, driving toward more agile, accessible, and adaptive methods of teacher professional development.

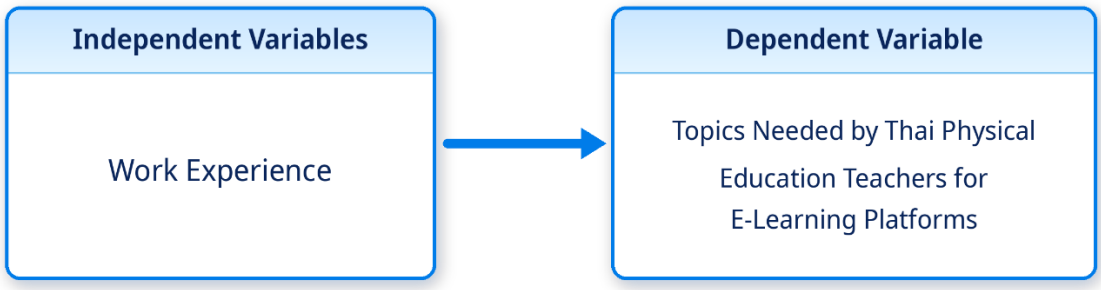


Figure 1. Conceptual framework

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Methodology

This study received approval for human research ethics from the Multi-Institutional Research Ethics Committee, Panel 2: Social Sciences, Humanities, and Fine Arts, Chulalongkorn University, Certificate No. 284/68.

Population

The target population consisted of 14,827 physical education teachers working under the Office of the Basic Education Commission (OBEC) nationwide (Office of Personnel Management and Legal Affairs Development, 2025). The sample size was calculated using the Taro Yamane formula, which is suitable for survey research involving a known population (Chaokromthong & Sintao, 2021). The initial calculation yielded a required sample of 390 participants. To reduce the risk of non-response and incomplete data, an additional 15 percent was added in accordance with standard survey research procedures (Ruenphet et al., 2025). As a result, the final required sample size was determined to be 448 participants.

Sampling Method

A multistage sampling technique was applied to recruit physical education teachers from both primary and secondary schools under OBEC. The process consisted of the following steps.

1. Regional Stratification: Thailand was divided into seven geographic areas: Northern, Central, Southern, Eastern, Western, Northeastern, and Bangkok (Office of the Royal Society of Thailand, 2015). Because Bangkok has a distinct administrative and social context, data collection for the capital was conducted separately from the other six regions. A target of 64 participants was set for each region.

2. Provincial Stratification: Within each of the six regions, four provinces were randomly selected using the Research Randomizer tool (Urbaniak & Plous, 2025). In Bangkok, random selection was conducted at the Educational Service Area Office level rather than the provincial level. A quota of 16 participants was assigned to each selected province or educational service area.

The selected provinces were as follows:

1) Southern region, which included Phang Nga, Pattani, Nakhon Si Thammarat, and Surat Thani.
2) Central region, which included Nakhon Sawan, Lopburi, Nakhon Pathom, and Pathum Thani.
3) Eastern region, which included Chachoengsao, Prachinburi, Sa Kaeo, and Trat.
4) Northern region, which included Chiang Mai, Phayao, Nan, and Lampang.
5) Western region, which included Tak, Kanchanaburi, Ratchaburi, and Prachuap Khiri Khan.
6) Northeastern region, which included Udon Thani, Khon Kaen, Sakon Nakhon, and Amnat Charoen.
7) Bangkok, which included the Thonburi Primary Educational Service Area Office, the Rattanakosin Primary Educational Service Area Office, and Secondary Educational Service Area Offices 1 and 2.

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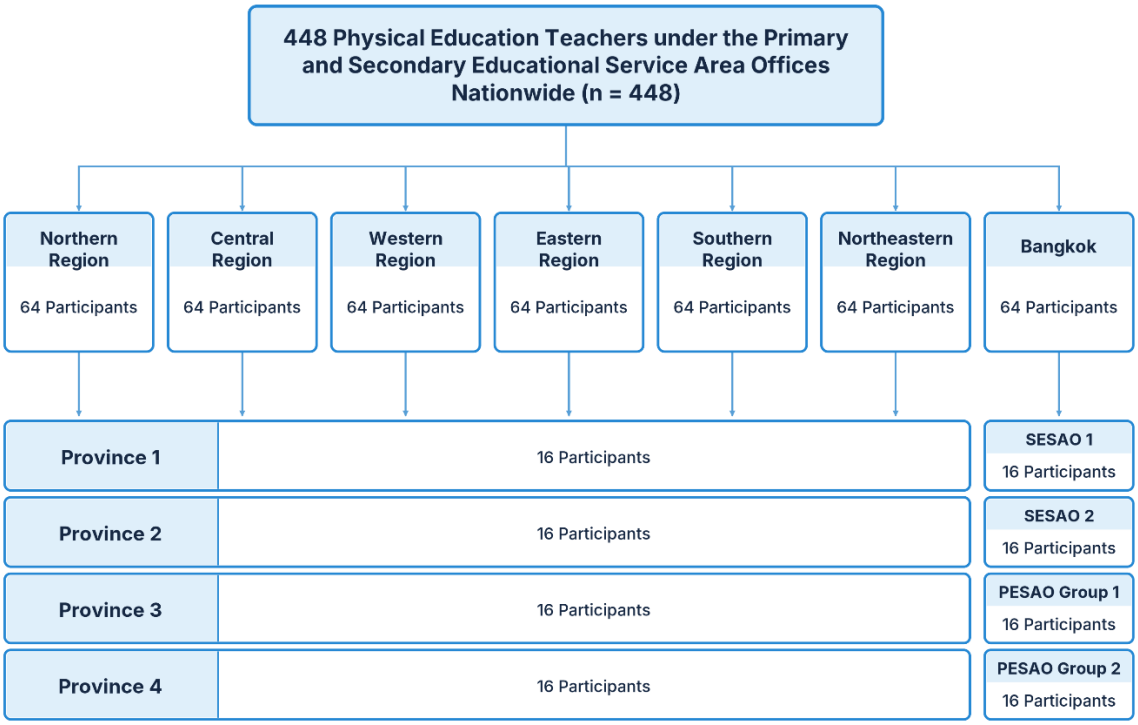


Figure 2. Sampling Method and A multistage sampling

Note: The sample size for each province was fixed at 16 participants, comprising eight physical education teachers from Primary Educational Service Area Offices and eight from Secondary Educational Service Area Offices.

3. After four provinces in each region were randomly selected, the sample size for each province was set at 16 participants. This included eight physical education teachers from Primary Educational Service Area Offices and eight from Secondary Educational Service Area Offices.

3.1 Bangkok constituted a special case, as sampling was conducted at the level of Educational Service Area Offices rather than by province. The sample comprised 16 physical education teachers from Primary Educational Service Area Office Group 1 and 16 from Primary Educational Service Area Office Group

3.2 This allocation reflects the administrative structure of the Bangkok Primary Educational Service Area Office, which organizes its affiliated schools into three groups: Dvaravati, Rattanakosin, and Thonburi (Bangkok Primary Educational Service Area Office, 2025). In addition, the Bangkok sample included 16 physical education teachers from Secondary Educational Service Area Office 1 and 16 from Secondary Educational Service Area Office 2.

Research instrument

This study employed a single research instrument in the form of an online questionnaire distributed through Google Forms. The questionnaire was designed to investigate the training topics that physical education teachers preferred to study via an e-learning format. Each item was rated using a five-point Likert scale, ranging from the highest to the lowest level of agreement. The mean scores were interpreted based on the criteria established by Nyutu et al. (2021).

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Mean	Level of Need
1.00–1.80	Lowest
1.81–2.60	Low
2.61–3.40	Moderate
3.41–4.20	High
4.21–5.00	Highest

This study sought to examine the training topics that Thai physical education teachers preferred to undertake through an e-learning format. Data were collected using an online questionnaire administered through Google Forms.

The questionnaire consisted of three sections.

Section 1: collected general demographic information through seven items, including gender, age, institutional affiliation, school size, geographic region, province of school location, and years of teaching experience.

Section 2: 103 survey items organized into five components, as detailed below.

Component 1: Curriculum, instruction, assessment, and instructional development

Component 2: Organization of school activities and sports competitions

Component 3: Sports competitions between schools and athlete development

Component 4: Physical education for students with special needs

Component 5: Sports clubs, recreation, and physical activity promotion

Section 3: Open-ended section for free suggestions

The final section of the questionnaire consisted of an open-ended question designed to allow participants to suggest additional training topics not previously listed, as well as to provide any further recommendations.

After the instrument was developed, it was submitted to three subject matter experts for evaluation of content validity. The assessment employed the Index of Item Objective Congruence, which determines the degree to which each item corresponds with the research objectives. The calculated IOC value was 0.99, indicating a very high level of alignment between the questionnaire items and the study objectives.

The questionnaire was then revised based on the experts' feedback and pilot tested with 30 physical education teachers from schools that were not included in the main sample. Internal consistency was examined using Cronbach's alpha. When examining individual components, the results revealed that Component 2 yielded the highest reliability coefficient (α = 0.84), followed by Component 5 (α = 0.83), Component 1 (α = 0.82), and Component 4 (α = 0.81). Component 3 demonstrated the lowest coefficient at 0.80. Crucially, the overall reliability coefficient for the entire instrument was 0.87, indicating that the research tool possesses an acceptable and standardized level of internal consistency (Hair et al., 2010). On this basis, the instrument was considered suitable for implementation in the primary data collection phase.

Data collection

1. Documents and academic literature related to the professional duties of physical education teachers in Thailand were examined. The content areas of the questionnaire were derived from national school physical education programs and relevant scholarly sources.

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2. After defining the content framework, a questionnaire was drafted using a five-point Likert scale ranging from the highest to the lowest level. A total of 103 prospective training topics suitable for e learning delivery were identified. The instrument was subjected to content validity evaluation, revised accordingly, pilot tested, analyzed for reliability, and refined before being used in the primary data collection.

3. An official letter was issued by the Demonstration Secondary School, Faculty of Education, Chulalongkorn University to request cooperation from the Primary and Secondary Educational Service Area Offices in the selected provinces. The letter sought support in distributing the questionnaire to physical education teachers and included a QR code directing participants to the online survey hosted on Google Forms.

4. Formal correspondence was then sent to the relevant Primary and Secondary Educational Service Area Offices in each selected province to invite physical education teachers under their supervision to participate voluntarily in the study.

5. The collected data were processed using descriptive statistical methods. The results were organized, summarized, and interpreted in line with the research objectives.

Data analysis

Quantitative data were analyzed using descriptive statistics (mean, standard deviation, and percentage) via SPSS. The training topics were ranked by mean scores to provide a national overview of preferred e-learning areas. Furthermore, a comparative ranking analysis was conducted to identify and contrast the Top 5 topics prioritized by teachers across different experience levels. All findings are presented in a tabular format to highlight the shifting professional development needs throughout the teachers' career stages.

Results

The required sample size of 448 completed questionnaires was exceeded. Because the online survey link was clear and easy to use, and participation was voluntary, the final number of responses surpassed this initial target. This level of response is above benchmarks often reported in survey research literature (Wu et al., 2022). The results are presented in five major parts.

1. The majority of the respondents were male (n = 300, 66.96%), while females accounted for the remaining 33.04% (n = 148). As presented in Table 1.

Table 1. Respondent general information.

Gender	Number	Percentage
Male	300	66.96
Female	148	33.04

2. The largest age group among the participants was 31–40 years (n = 181, 40.40%), followed by those aged under 30 years (n = 142, 31.70%) and 41–50 years (n = 107, 23.88%). Individuals aged 51 years and over constituted the smallest proportion of the sample (n = 18, 4.02%). As illustrated in Table 2.

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Table 2. Distribution by age.

Age	Number	Percentage
Under 30 years	142	31.70
31–40 years	181	40.40
41–50 years	107	23.88
51 years and above	18	4.02

3. The largest segment of the sample consisted of early-career teachers with 1–5 years of experience (n = 155, 34.60%). This was followed sequentially by those with 6–10 years (n = 110, 24.55%) and 11–15 years (n = 101, 22.54%). Mid-to-late career cohorts comprised smaller proportions 16–20 years (n = 48, 10.71%) and 21–25 years (n = 25, 5.58%), while those with 26 years or more constituted the smallest share (n = 9, 2.01%). As shown in Table 3.

Table 3. A Distribution by working experience.

Working Experience	Number	Percentage
1–5 years	155	34.60
6–10 years	110	24.55
11–15 years	101	22.54
16–20 years	48	10.71
21–25 years	25	5.58
26 years or more	9	2.01

4. The top ten e-learning professional development topics were prioritized based on their mean scores (M), standard deviations (SD), and corresponding qualitative interpretations. The empirical evidence indicates that the professional development needs for all top ten categories were exceptionally high (M = 4.25 - 4.48, SD < 1.00), demonstrating a strong consensus among participants regarding these priorities. Foundational and administrative competencies dominated the rankings; specifically, "Physical Education Curriculum Development" emerged as the highest priority (M = 4.48), while event organization and assessment literacy ranked within the top four. Regarding instructional pedagogy, there was a pronounced demand for evidence-based specialization in volleyball techniques, strength training, and sports conditioning. Furthermore, participants emphasized the integration of sports science—specifically targeting circulatory health—and the utilization of sports as a social intervention tool (e.g., anti-drug programs). Lastly, the inclusion of budgeting and interpersonal communication underscores a comprehensive demand for professional excellence, effectively bridging technical domain knowledge with organizational and soft skills. As presented in Table 4.

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Table 4. Top 10 Desired Training Topics in E-Learning Format.

Rank	Item Number	Training Topics Desired	M	SD	Level of Need
1	Q1.	Physical Education Curriculum Development	4.48	0.67	Highest
2	Q31.	School Sports Day Event Organization	4.34	0.78	Highest
3	Q6.	Measurement and Evaluation in Physical Education	4.33	0.73	Highest
4	Q25.	Techniques and Methods for Teaching Volleyball in Physical Education	4.29	0.82	Highest
5	Q34.	Methods for Organizing Anti-Drug Sports Competitions	4.28	0.82	Highest
6	Q3.	Techniques and Methods for Teaching Physical Education Using Resistance Exercise	4.28	0.83	Highest
7	Q35.	Principles of Coaching Athletics	4.28	0.91	Highest
8	Q100.	Techniques for Promoting Exercise to Improve the Circulatory System	4.27	0.81	Highest
9	Q33.	Interpersonal Relations and Communication for Physical Education Teachers	4.26	0.79	Highest
10	Q30.	Budget Management Strategies for School Activities	4.25	0.87	Highest

5. The professional training requirements of physical education (PE) teachers evolve distinctively across different career stages. For educators with 1–20 years of experience, "Physical Education Curriculum Development" (Q1) remains the highest priority, indicating a sustained emphasis on foundational pedagogical design. Within this broader cohort, early-career educators (1–10 years) prioritize administrative event organization (Q31), whereas mid-career cohorts (11–20 years) shift their focus toward budgetary management and coaching principles (Q30, Q35). A turning point occurs beyond the 20-year milestone; teachers with 21–25 years of experience lean toward specialized instructional methodologies, such as resistance training (Q3), rather than general curriculum design. Ultimately, the most senior educators (26+ years) prioritize advanced sports science and physiological conditioning, including athletic fitness (Q77) and muscle-building techniques. Collectively, these findings illustrate a clear developmental trajectory, wherein educators transition from generalist curriculum managers into highly specialized technical and sports science experts as their careers progress that demonstrated in Table 5.

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Table 5. Top 5 Desired Training Topics in E-Learning Format by comparing Teaching Experience Levels.

Rank	1–5 Years	6–10 Years	11–15 Years	16–20 Years	21–25 Years	More than 26 Years
1	Q1. Physical Education Curriculum Development	Q1. Physical Education Curriculum Development	Q1. Physical Education Curriculum Development	Q1. Physical Education Curriculum Development	Q3. Techniques and Methods for Teaching PE Using Resistance Exercise	Q77. Physical Fitness Training for Athletes
2	Q31. School Sports Day Event Organization	Q31. School Sports Day Event Organization	Q35. Principles of Coaching Athletics	Q6. Measurement and Evaluation in Physical Education.	Q1. Physical Education Curriculum Development	Q91. Techniques for Promoting Exercise to Build Muscle
3	Q78. Sports Psychology	Q3. Techniques and Methods for Teaching PE Using Resistance Exercise	Q89. Techniques for Establishing Sports and Recreation Clubs	Q35. Principles of Coaching Athletics	Q22. Techniques and Methods for Teaching Football in PE	Q92. Techniques for Promoting Stretching Exercises
4	Q25. Techniques and Methods for Teaching Volleyball in PE	Q34. Methods for Organizing Anti-Drug Sports Competitions	Q30. Budget Management Strategies for School Activities	Q30. Budget Management Strategies for School Activities	Q16. Techniques and Methods for Teaching Table Tennis in PE	Q83.3 Personality and Posture for Sports Officials
5	Q77. Physical Fitness Training for Athletes	Q6. Measurement and Evaluation in Physical Education	Q34. Methods for Organizing Anti-Drug Sports Competitions	Q47. Principles of Coaching Football	Q13. Techniques and Methods for Teaching Sepak Takraw in PE	Q6. Measurement and Evaluation in Physical Education

Discussion

The discussion in this study highlights three key insights beneficial to policy-making by relevant government agencies responsible for the professional development of physical education teachers.

1. Dynamics of Professional Development for Physical Education Teachers

A longitudinal analysis of physical education teachers in Thailand reveals a highly dynamic, stage-responsive professional development trajectory. Rather than displaying fragmented and unpredictable needs, the empirical data illustrated in Table 5. demonstrates a clear evolution from operational execution and administrative generalism in early-to-mid career stages toward specialized sports science and scientific mastery in later years. This developmental trajectory is anchored by a remarkable empirical consistency across the first two decades of the teaching career. For educators spanning the 1 - 5 years, 6 - 10 years, 11 - 15 years, and 16 - 20 years cohorts, Physical Education Curriculum Development (Q1) stands unanimously as their absolute highest professional development priority (Rank 1). This shared anchor statistically validates the grouping of these four subgroups into a cohesive "early-to-mid career macro-cohort" (1-20 years), all of whom face the ongoing, high-stakes challenge of translating national curriculum standards into effective, localized classroom instruction.

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However, beneath this overarching curriculum anchor, a subtle and vital transition occurs within this 1 – 20 years spectrum, reflecting the changing institutional roles assigned to teachers as they gain experience:

1) The Operational and Acculturation Phase (1 - 10 years) For both the 1 - 5- and 6-10-years cohorts, School Sports Day Event Organization (Q31) emerges as the unanimous Rank 2 priority. This reflects the immediate operational realities of Thai schools, where junior PE teachers are culturally tasked with orchestrating massive community-facing athletic events to build professional credibility and secure institutional trust.

2) The Managerial and Budgetary Phase (11 - 20 years) As teachers cross the 10-year threshold, their administrative burdens shift from manual event coordination to high-level resource management. This is empirically evidenced by the rise of Budget Management Strategies for School Activities (Q30) to Rank 4 for both the 11-15 and 16 - 20 years cohorts.

This developmental progression aligns with Huberman et al.'s (1993) stages of stabilization and role-building. Novice and mid-career Thai PE teachers do not merely teach; they must navigate a complex institutional landscape where operational competency and fiscal management are prerequisites for professional survival and identity construction.

Conversely, late-career educators (21+ years) experience a profound pedagogical saturation, triggering a shift toward high-level specialization and scientific mastery. At 21 - 25 years of service, curriculum development (Q1) drops to Rank 2, superseded by a demand for Techniques and Methods for Teaching PE Using Resistance Exercise (Q3) at Rank 1. For veteran educators with over 26 years of experience, curriculum concerns drop out of the top five entirely, replaced by highly specialized athletic training demands, with Physical Fitness Training for Athletes (Q77) securing Rank 1 and Techniques for Promoting Exercise to Build Muscle (Q91) at Rank 2. This evolution strongly supports Fessler & Christensen's (1992) teacher career cycle model, which posits that late-career educators seek to avoid professional stagnation by pursuing intellectually challenging, specialized domains rather than repeating basic pedagogical training. This is further corroborated by Muhammad et al. (2025) regarding senior teachers' distinct preference for highly tailored, advanced professional development.

Based on these empirical findings, educational authorities must abandon standardized, "one-size-fits-all" training mandates in favor of a Differentiated Career Lifecycle Policy Framework:

1) For early-to-mid career educators (1–20 years) Policies must focus on providing dual-track support. In addition to curriculum implementation, professional development must offer structured training in event logistics (for those in their first decade) and strategic fiscal management (for those in their second decade). Simultaneously, educational authorities should advocate for dedicated administrative staff to absorb routine logistical burdens, safeguarding the instructional focus of these developing educators.

2) For senior educators (21+ years) Policies must pivot away from basic pedagogical reviews. Instead, state funding, research grants, and specialized micro-credentials should be directed toward advanced sports science, biomechanics, and athletic conditioning. Furthermore, school systems should structurally leverage this cohort's deep expertise by positioning them as virtual master mentors for junior colleagues.

Restructuring professional development along this dynamic professional career trajectory not only mitigates institutional budgetary waste but also strategically leverages the evolving competencies of educators to ensure sustained systemic quality.

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2. The Multi-Role Burden of Thai Physical Education Teachers

The prominence of non-classroom responsibilities within the top training priorities directly illuminates the multi-role burden imposed on Thai PE teachers. The high ranking of School Sports Day Event Organization (Q31) (Rank 2 for 1 - 10 years) and Principles of Coaching Athletics (Q35) (Rank 2 for 11 - 15 years and Rank 3 for 16 - 20 years) highlights that a Thai PE teacher's professional success is heavily evaluated on their performance outside the traditional classroom walls.

In the Thai educational context, the annual school sports day is not merely an extracurricular activity; it is a vital cultural cornerstone for community engagement, public relations, and school prestige. The immense logistical, fiscal, and public safety pressures of organizing these massive events fall squarely on PE teachers, explaining why junior educators feel an urgent, pragmatic need to master event logistics alongside classroom teaching. Similarly, the strong demand for athletics coaching techniques reflects the highly competitive nature of local and national inter-school sports tournaments in Thailand. Because schools are often judged on their athletic achievements, and because the Department of Physical Education (2024) notes a lack of standardized, accessible sports coaching certifications, PE teachers must actively seek out coaching and training strategies to meet these institutional expectations.

Furthermore, the specific interest in sports like Volleyball (Rank 4 for 1 - 5 years) and Football (Rank 5 for 16 - 20 years) demonstrates how cultural and national sports successes—such as Thailand's prominent international standing in volleyball (Volleyball World, 2025)—directly influence local educational demands. This "national hero" effect drives heightened student interest, forcing PE teachers to seek out advanced instructional methods and biomechanical safety protocols (Srisomphot, 2024) to manage highly enthusiastic, sports-specific classrooms.

These empirical insights underscore the reality that Thai PE teachers function as educators, event managers, budget administrators, and athletic coaches simultaneously. While it is vital for state authorities to provide professional development that reflects these authentic, multi-faceted roles, a critical counter-perspective must be addressed: Thai PE teachers are severely overworked. This extreme institutional demand poses a direct threat to the core quality of physical education. When the system forces educators to prioritize complex logistical management, community event coordination, and administrative compliance over lesson preparation and pedagogical reflection, classroom quality inevitably degrades. This systemic strain ultimately compromises student learning outcomes, resulting in lower physical literacy, suboptimal motor skill development, and a general decline in student well-being.

3. Leveraging E-Learning for the Sustainable Professional Development of PE Teachers

To operationalize the differentiated career framework proposed in Section 1 and mitigate the operational strains and time-poverty highlighted in Section 2, the delivery modality of professional development must pivot from rigid, face-to-face training archetypes toward a digital-first, stage-responsive infrastructure. Rather than exacerbating the systemic burnout of PE teachers by demanding physical attendance at off-site seminars, localized e-learning frameworks offer a scalable, flexible, and non-disruptive pathway for continuous professional growth. For early-to-mid career teachers, who bear the heaviest administrative and logistical burdens inside and outside the classroom, professional development must be seamlessly integrated into highly fragmented schedules. Asynchronous micro-learning platforms serve as the critical delivery mechanism for this cohort. By delivering bite-sized, mobile-compatible modules focused on the immediate administrative and event-logistics skills they require, this digital format functions as a vital "temporal buffer." It allows junior educators to upskill on-demand and at their own pace, optimizing their operational efficiency without disrupting their core instructional duties. This localized, self-paced delivery aligns with

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the findings of Yang & Qian (2025), who argued that digital learning ecosystems must be contextually tailored to fit the demanding and highly specific labor realities of physical education teachers.

Conversely, for senior educators who seek professional mastery and leadership roles, the e-learning infrastructure must transcend basic tutorial delivery. The digital architecture for this cohort should be designed around specialized, web-based Communities of Practice (CoPs) and advanced micro-credential pathways. These platforms should not only host specialized knowledge in advanced sports science but also structurally position senior teachers as virtual master mentors. By leveraging digital dashboards and collaborative workspaces, veteran educators can facilitate remote peer coaching, evaluate digital portfolios, and provide asynchronous mentorship to novice colleagues across different regions. This approach not only satisfies the cognitive and professional needs of late-career educators but also systemically addresses geographical barriers in teacher mentorship.

Ultimately, leveraging stage-aligned digital modalities transforms professional development from an expensive, one-size-fits-all administrative mandate into a highly scalable, self-sustaining virtual ecosystem. This systemic transition is highly viable; as substantiated by Yefremenko et al. (2025), physical education teachers exhibit a profound and rapidly increasing receptivity toward electronic learning modalities, indicating a strong readiness for digitized, stage-appropriate professional growth.

Conclusion and Recommendations

This study concludes that enhancing the professional quality of Thai physical education requires a paradigm shift from standardized training to a dynamic, e-learning-driven professional development approach and structural workload recalibration. Empirical evidence reveals that PE teachers undergo distinct career phases, shifting from operational generalism focused on school-wide event orchestration in their first twenty years, to a demand for scientific specialization in advanced sports science during later career stages. To optimize systemic efficiency, educational authorities must implement a Differentiated Career Lifecycle e-learning Framework. This entails leveraging asynchronous micro-learning platforms to provide administrative and fiscal training for early-career educators, while deploying specialized digital platforms, micro-credentials, and virtual master-mentor dashboards for senior teachers. Furthermore, policy makers must address the severe multi-role burdens—stemming from non-classroom expectations like sports day and coaching after school—which currently overwork educators. Without reducing these administrative pressures and integrating user-centric digital support, the quality of classroom instruction will continue to degrade, ultimately compromising student learning outcomes, physical literacy, and long-term well-being.

Policy Recommendations for Educational Authorities

1. The Ministry of Education and relevant office bodies (such as OBEC and the Department of Physical Education) must abandon the traditional "one-size-fits-all" professional development model. Administrative policies should formally mandate differentiated training tracks based on professional longevity: a dual-track focus on basic pedagogy paired with operational/fiscal logistics for the first two decades (1–20 years), and an exclusive pathway toward advanced sports science specialization for late-career educators (21+ years).

2. Government agencies should invest in the architecture of a dedicated, digital-first learning ecosystem. This national platform must support dual modalities: asynchronous, mobile-compatible micro-learning modules for time-poor junior teachers, and web-based Communities of Practice (CoPs) featuring digital dashboards to facilitate remote, cross-regional mentorship networks.

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Recommendations for Future Research

1. this study provides a comprehensive nationwide empirical baseline of training needs, future research should employ qualitative methodologies—such as in-depth interviews or focus groups—to investigate the institutional, cultural, and psychological barriers PE teachers face regarding e-learning adoption and digital literacy.

2. Future studies should design, implement, and evaluate a pilot version of the stage-responsive e-learning platform proposed in this framework. Longitudinal action research is recommended to measure the empirical impact of localized micro-learning versus face-to-face frameworks on both teacher retention rates and student physical literacy outcomes.

Limitations

Although this study has contributed a lot, it has limitations. First, the use of self-reported data may be subject to social desirability or response biases. Second, although prioritized topics are investigated in the study, not all the broader social and economic factors in individual schools may be included. Finally, the results are unique to Thai educational setting; the generalizability of the findings to other cultural or policy settings should be interpreted delicately.

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