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Evaluating the Professional Effectiveness of Online Physical Education Lectures at Ho Chi Minh City University of Technology and Education, Vietnam

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Abstract

Context: This study identifies a set of professional criterion for evaluating online Physical Education (PE) lectures and empirically tests their efficacy on 128 students at Ho Chi Minh City University of Technology and Education (HCMUTE). ***Findings:*** Six professional criteriion (PC) were selected through two rounds of expert interviews and Wilcoxon signed-rank testing ($P > 0.05$): (1) Lecture Introduction; (2) Lecture Content; (3) Learner Interaction; (4) Teaching Materials; (5) Multimedia Usage; and (6) Assessment & Evaluation. The resulting scale demonstrated high internal consistency (Cronbach's $\alpha = 0.809$). After eight weeks of implementation, the combined mean score across all six criterion was 3.96/5 ("Agree"), with the highest subscore for Lecture Content (4.13 ± 0.83) and the lowest for Multimedia Usage (3.69 ± 0.97). Coefficients of variation (Cv) fell below 25 % for most criterion, indicating strong consensus among students. ***Discussion:*** These findings confirm both the feasibility and professional effectiveness of online PE lectures while suggesting that multimedia design should be further improved to enhance the learning experience.

Keywords: online lecture, professional effectiveness, physical education, evaluation.

1. INTRODUCTION

Digital transformation in Physical Education (PE) has helped preserve students' training continuity when in-person classes were disrupted. However, robust tools are needed to quantify the quality of online PE lectures. Internationally, numerous studies highlight the importance of evaluating online PE teaching effectiveness against well-defined professional criterion. For example, Boonsem and Chaoensupmanee (2020) surveyed 1,000 Thai undergraduates and identified six major factors influencing PE teaching effectiveness: lesson objectives, curriculum content, teaching methodology, instructor competence, facilities, and learning outcomes assessment [1]. Similarly, Tagimaucia *et al*. (2024) interviewed 35 secondary-school PE teachers in Fiji and found that "lack of technology support equipment" and "inexperience with online teaching methods" were the two greatest obstacles, leading them to propose a framework of professional indicators such as interaction level, video-instruction quality, and capacity to assess movement remotely [7]. Hu and Liu (2023) developed a quality-evaluation system for online PE instruction in higher education using Analytic Hierarchy Process (AHP). They defined seven criterion - lesson objectives, content, methodology, materials, digital technology, student satisfaction, and willingness to continue - validated the model's internal consistency, and determined the relative priority of each criterion among Chinese instructors and learners [3]. More recently, Saiz-González *et al*. (2025) surveyed 412 university PE teachers in Spain using the UTAUT2 framework. Their findings showed that "platform ease of use" and "institutional support" were the top two determinants of professional teaching effectiveness in online PE [6].

At Ho Chi Minh City University of Education (HCMUE), the PE curriculum integrates both theoretical knowledge and practical skills, requiring students to produce video recordings and presentations on their

training processes. Transitioning to online delivery must preserve professional standards such as precise movement technique instruction, clear teaching aids, and rigorous assessment. To date, no study has established a foundational set of professional criterion and empirically tested the actual effectiveness of online PE instruction at HCMUE.

Accordingly, this paper has two primary objectives: (1) To develop a set of professional criterions for evaluating the quality of online PE lectures. These criterion were drawn from international recommendations (Boonsem & Chaoensupmanee, 2020; Tagimaucia *et al*., 2024; Hu & Liu, 2023; Saiz-González *et al*., 2025) and adapted to the Vietnamese PE context, resulting in six criterions: Lecture Introduction; Lecture Content; Learner Interaction; Teaching Materials; Multimedia Usage; and Assessment & Evaluation. (2) To evaluate the actual professional effectiveness after applying these criterions to 128 students who participated in an eight-week online PE course, thereby determining how well the lectures met professional standards and identifying areas for improvement.

The remainder of this paper is structured as follows: Section 2 describes the theoretical framework and the basis for selecting professional criterion, referencing key international studies; Section 3 outlines the research methodology, including expert interviews, Wilcoxon testing, and Cronbach's Alpha reliability analysis; Section 4 presents the survey results from 128 students in the experimental group; Section 5 discusses the appropriateness of the criterion, compares findings with international research, and suggests enhancements; and Section 6 provides concluding remarks and recommendations for scaling up online PE instruction at HCMUE.

2. RESEARCH METHODOLOGY

This section details the design, instrument development, sampling, data collection, and analysis procedures used to assess the professional effectiveness of online PE lectures at HCMUTE.

2.1. Study Design

The research employed a three-phase procedure to develop and validate a set of professional criterion, then measure student feedback after eight weeks of online PE instruction:

Criterion Compilation:

We reviewed and synthesized professional evaluation criterion from the literature and international studies (Boonsem & Chaoensupmanee, 2020; Tagimaucia *et al*., 2024; Hu & Liu, 2023; Saiz-González *et al*., 2025). An initial pool of eight potential professional criterion was drafted: Lecture Introduction, Lecture Content, Learner Interaction, Teaching Materials, Multimedia Usage, Assessment & Evaluation, Learning Outcomes, and Interdisciplinary Integration.

Two-Round Expert Interviews:

Twenty experts (PE instructors, education methodology faculty, and academic affairs officers) participated in two rounds of semi-structured interviews to refine the criterion. In each round, experts rated each criterion using a three-tier priority scale (Priority 1 = 3 points; Priority 2 = 2 points; Priority 3 = 1 point). A criterion was retained if it: Achieved at least 80 % agreement in both rounds and showed no statistically significant difference between rounds in a Wilcoxon signed-rank test ($P > 0.05$).

Based on these thresholds, the eight initial criterion were narrowed to six: PC1 - Lecture Introduction: Clarity of objectives and connection to real-world context; PC2 - Lecture Content: Accuracy, logical structure, and inclusion of practical exercises; PC3 - Learner Interaction: Bidirectional communication, timely support, and feedback; PC4 - Teaching Materials: Richness, up-to-date content, and ease of access; PC5 - Multimedia Usage: Use of engaging videos/images with appropriate length; PC6 - Assessment & Evaluation: Diversity and clarity of assessment methods and criterion.

Internal Consistency Reliability Testing:

We used Cronbach's Alpha to assess the internal consistency of the six selected criterion. Each criterion was operationalized as a composite variable formed by multiple survey items. A criterion was retained if: Cronbach's $\alpha \geq 0.60$, and each item's corrected item–total correlation ≥ 0.30. The final six criterion achieved Cronbach's $\alpha = 0.809$, verifying that the set was reliable for evaluating the professional effectiveness of online PE lectures.

2.2. Participants and Sampling

Target Population:

First- and second-year students enrolled in three online PE classes (Chess, Volleyball, and Tennis) at HCMUE during the second semester of the 2024–2025 academic year.

Experimental Group (EG):

128 students who completed at least eight weeks of synchronous and asynchronous online PE instruction via the university's LMS platform.

Control Group (CG):

126 students in traditional, face-to-face PE classes (not the primary focus of this paper but recorded for broader efficacy comparison).

Selection Criterion:

Voluntary participation, stable Internet access, and availability of a device (computer or smartphone) capable of accessing the online platform and recording practice videos.

2.3. Data Collection Instruments

Professional Effectiveness Survey (Appendix A):

Comprises six criterion (PC1–PC6), each operationalized by 4–5 Likert-scale items (1 = "Strongly Disagree" to 5 = "Strongly Agree"). A pilot test with 30 students was conducted to refine wording, eliminate ambiguous questions, and ensure completion time of approximately 8–10 minutes.

Expert Interview Protocol:

Guided semi-structured interviews for criterion selection. Each expert recorded priority scores for each proposed criterion and provided qualitative justification**.**

2.4. Data Collection and Processing

Timeline: Data were gathered between April and May 2025, after eight weeks of online PE teaching.

Procedures:

(1) Online Survey: The Professional Effectiveness Survey was distributed via the LMS (Moodle/Canvas) with an accompanying Google Form link. Participants were assured anonymity. Responses taking less than five minutes or leaving more than 20 % of items blank were excluded. A total of 128/135 valid responses were retained. (2) Expert Interviews: Two sequential rounds of interviews, each involving 20 experts. Sessions were recorded and transcribed to compile priority scores.

Reliability Analysis (Cronbach's Alpha):

Conducted in SPSS 26.0. The overall α for the six criterion was 0.809. Each survey item also demonstrated a corrected item–total correlation > 0.30, confirming their appropriateness for inclusion.

Statistical Analysis:

(1) Descriptive Statistics: Means, standard deviations (SD), standard errors (SE), and coefficients of variation (Cv) were computed for each criterion; (2) Wilcoxon Signed-Rank Test: Used to confirm no significant difference in expert ratings between Round 1 and Round 2 ($P > 0.05$); (3) Paired t-Test: Employed to compare pre- and post-course physical fitness test results (e.g., sit-ups, standing long jump, grip strength) within EG and between EG and CG, although these fitness outcomes fall outside this paper's primary professional criterion focus; (4) Coefficient of Variation (Cv): Assessed the degree of consensus among students for each criterion; Cv < 25 % indicated strong agreement.

2.5. Study Limitations

This study measured student self-reported satisfaction and consensus with the six professional criterion; it did not include direct observational measures such as video analysis of movement technique or objective assessments of motor skill acquisition. The sample comprised only three PE class types (Chess, Volleyball, Tennis), which may not capture the full diversity of HCMUE's PE curriculum. Reliance on self-report questionnaires may introduce response bias related to students' transient mood or survey-completion habits.

3. RESULTS

3.1. Selection and Validation of Professional Criterion (PC)

The six professional criterion (PC1–PC6) were confirmed via expert consensus and Wilcoxon testing (Table 1). Across both interview rounds (n = 20), each retained criterion achieved ≥ 80 % agreement and exhibited no significant difference between rounds ($P > 0.05$).

Table 1: Expert Ratings for Professional Criterion (n = 20, Wilcoxon Signed-Rank Test)

No.	Criterion (Abbreviation)	Round 1 Σ Points	Round 1 %	Round 2 Σ Points	Round 2 %	Z	Asymp. Sig. (2-tailed)
1	PC1 - Lecture Introduction	51	85	53	88.3	-1.000[b]	.317
2	PC2 - Lecture Content	50	83.3	51	85	-.577[b]	.564
3	PC3 - Learner Interaction	53	88.3	54	90	-1.000[b]	.317
4	PC4 - Teaching Materials	55	91.7	53	88.3	-1.414[c]	.157
5	PC5 – Multimedia Usage	50	83.3	52	86.7	-1.414[b]	.157
6	PC6 - Assessment & Evaluation	53	88.3	53	88.3	.000[d]	1.000
7	PC7 - Learning Outcomes	28	46.7	29	48.3	-.447[b]	.655
8	PC8 - Interdisciplinary Integration	29	48.3	29	48.3	.000[d]	1.000

Note: [a] Wilcoxon Signed-Ranks Test, [b] Based on negative ranks, [c] Based on positive ranks, [d] Sum of negative ranks equals sum of positive ranks

Since PC7 and PC8 failed to reach the 80 % consensus threshold, they were removed. The remaining six criterion (PC1–PC6) satisfied both the consensus and Wilcoxon test conditions. Next, the internal consistency of these six criterion was assessed via Cronbach's Alpha (Table 2).

Table 2: Cronbach's Alpha Reliability for Professional Criterion

No.	Item (Criterion)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item–Total Correlation	Cronbach's Alpha if Item Deleted
Overall Scale (α = 0.809)					
1	PC1 - Lecture Introduction	19.91	8.835	0.595	0.773
2	PC2 - Lecture Content	19.66	9.311	0.545	0.784
3	PC3 - Learner Interaction	19.7	9.376	0.64	0.767
4	PC4 - Teaching Materials	19.69	9.209	0.612	0.77
5	PC5 - Multimedia Usage	20.11	8.949	0.492	0.801
6	PC6 - Assessment & Evaluation	19.91	9.456	0.563	0.781

All six criterion demonstrated corrected item–total correlations > 0.30 and contributed to an overall Cronbach's α = 0.809, confirming the scale's reliability for evaluating professional effectiveness.

3.2. Student Evaluations of Professional Effectiveness

After eight weeks of online PE instruction applying the six professional criterion, 128 students rated each criterion on a 5-point Likert scale. Table 3 and Figure 1 summarize their responses, indicating general satisfaction with the professional aspects of the online lectures. The overall mean across all criterion was 3.96 ("Agree"). Individual criterion means ranged from 3.69 to 4.13 ("Agree"), with the highest score for PC2 (4.13 ± 0.83) and the lowest for PC5 (3.69 ± 0.97). Coefficients of variation (Cv) for most criterion were below 25 %, reflecting strong student consensus, except for PC5 (Cv = 26.3 %), which exhibited greater variability in perceptions.

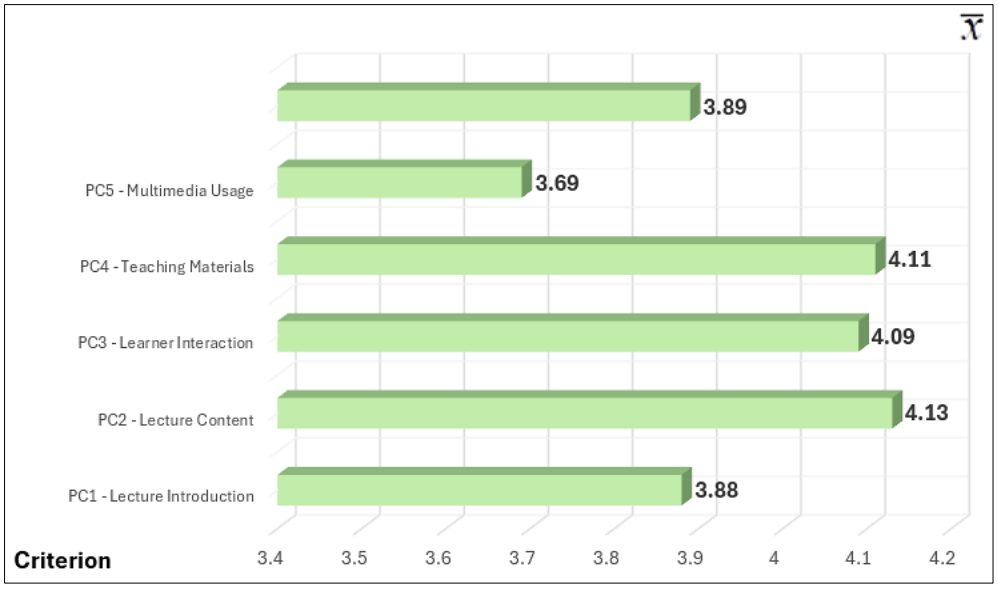

Figure 1: Professional Effectiveness of Online PE Lectures

Table 3: Professional Effectiveness of Online PE Lectures (n = 128)

No.	Criterion	Mean (×)	SD	SE	Cv (%)
1	PC1 - Lecture Introduction	3.88	.884	.078	22.8
2	PC2 - Lecture Content	4.13	.826	.073	20
3	PC3 - Learner Interaction	4.09	.726	.064	17.8
4	PC4 - Teaching Materials	4.11	.786	.069	19.1
5	PC5 - Multimedia Usage	3.69	.970	.086	26.3
6	PC6 - Assessment & Evaluation	3.89	.776	.069	19.9
	Overall Mean:	**3.96**			

Key observations:

Highest mean (4.13): PC2 (Lecture Content), indicating that students found the content highly accurate, well-organized, and actionable.

High ratings (> 4.0): PC3 (Learner Interaction) and PC4 (Teaching Materials) reflect strong approval of interactive features and resource quality.

Lowest mean (3.69): PC5 (Multimedia Usage), showing that while students "Agree" with the

multimedia elements, there remains room for improvement in video production quality, visual design, and duration.

Cv < 25 % for five criterion demonstrates student consensus; only PC5 exceeded 25 %, indicating more varied perceptions of multimedia effectiveness.

These results confirm that the online PE lectures met professional standards effectively, especially in content accuracy, interactivity, and resource provision, but highlighted multimedia design as an area needing enhancement.

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4. DISCUSSION

The high reliability (α = 0.809) of the six-criterion scale affirms its suitability for evaluating the professional aspects of online PE lectures. Student feedback indicates that online lectures performed well in terms of content structure, interactive support, and teaching resources. However, multimedia elements (e.g., video length, visual clarity, dynamic presentation) received comparatively lower satisfaction, suggesting that instructors should further refine filming, editing, and graphic design to optimize student engagement.

These findings align with Melton, Bigham, and Bland (2014), who reported that theoretical PE content can be as or more effective online than face-to-face, thanks to self-paced learning and access to diverse digital resources [4]. Conversely, Varea, González-Calvo, and García-Monge (2020) argued that core motor skills and physical fitness instruction - fundamental to PE - are significantly limited in an online context, lacking direct demonstration and real-time technique correction. Spanish PE teachers noted that teaching sport skills (e.g., running, jumping, volleyball techniques) remotely often fails, as real-time feedback and hands-on correction are absent, leading to technique errors and suboptimal instruction [8]. Traditional PE pedagogy relies on physical presence, tactile feedback, and individualized correction. Transitioning to entirely online methods without adapting pedagogical strategies risks rendering the lectures monotonous and professionally ineffective [2]. Kevin Mercier *et al*. (2021) found that nearly 40 % of U.S. PE instructors struggled to design content suited for online platforms, negatively impacting lecture quality and learner experience [5].

In sum, improving professional effectiveness in online PE instruction requires: (1) Enhancing instructors' digital competencies, including video production, interactive tool usage, and virtual classroom management; (2) Integrating motion-capture or AI-powered movement analytics to provide remote, objective feedback on student technique; (3) Adopting a blended learning model, combining synchronous online theory with occasional in-person practice sessions to compensate for practical skill limitations.

5. CONCLUSION

The six professional criterion (PC1–PC6) form a reliable measure for appraising online PE lectures. Empirical application reveals that, over eight weeks, online lectures excelled in content accuracy, interactive engagement, and teaching resources; however, multimedia presentation requires further refinement. These outcomes validate the potential to scale online PE instruction widely in the context of educational digital transformation.

Recommendations: Invest in multimedia production facilities and editing software to standardize video quality and graphical content. Incorporate branching lecture functions and real-time feedback mechanisms on the LMS to personalize student experiences. Implement a blended framework - delivering theoretical lessons online while conducting short, in-person practice clusters - to mitigate the lack of physical, hands-on interaction.

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