

Research Article

Assessment Strategies in Physical Education: A Mixed Method Analysis of Teachers Knowledge, Teaching Experience and Educational Level

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Abstract

Assessment is a crucial component of effective Physical Education (PE) instruction, providing valuable insights into students' learning and progress. However, limited studies have examined the influence of PE teachers' teaching experience and their knowledge of assessment strategies in Ghana. This study investigated the relationship between PE teachers' years of teaching experience and their proficiency in assessment strategies while also identifying differences in assessment strategies based on the educational level of PE teachers in Senior High Schools in the Central Region. Employing an explanatory sequential mixed-method design, the study collected both quantitative data from 175 teachers through a questionnaire and qualitative data from 10 teachers using an interview guide. Quantitative findings, analyzed using one-way ANOVA, revealed no statistically significant correlation between PE teachers' years of experience and their proficiency in understanding assessment strategies. Similarly, no significant differences in assessment strategies were found based on teachers' educational levels. However, qualitative analysis identified four key themes: the impact of teaching experience on the use of assessment strategies, quality and diversity of experience, fatigue and motivation in experienced teachers, and continuous learning and adaptation. These findings provide valuable insights into the influence of PE teachers' years of experience on their assessment knowledge, emphasizing the need for the Ghana Education Service (GES) to invest in professional development programs. Such initiatives would enhance assessment proficiency and foster a collaborative learning environment that transcends traditional experience-based hierarchies.

Keywords

Assessment Strategies, Physical Education, Teachers

1. Introduction

The benefits from physical activity (PA) are enormous, which substantially improve not only the physical fitness of individuals but also help to build emotionally stable and psychologically fit individuals within the society [25, 26]. For this reason, practitioners such as PE teachers need to hold up

the existence of PA and improve it further. One of the means PE teachers can ensure students meet PA targets is through proper assessment. Such assessment helps to improve the activities as students progress through the various segments. Through assessment, teachers gain an understanding of what

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learners have learned, how effectively they have completed assigned tasks, and the effectiveness of the materials, approaches, and techniques employed by the learner [8]. However, assessment should not be limited to evaluating system or learner performance alone, it needs to be based on pedagogy to guide the learning path [18]. The case is that, assessment also supports personal development of students because it acknowledges individual's accomplishments, fostering their identity [21]. A study by [32] found that students identified other factors influencing their grades in PE apart from their learning outcomes.

Various assessment strategies are employed to obtain information about students' achievement and overall development [29]. Assessment strategies are the complete set of documentation needed to assess one or more units of competency in learning. They are the tools PE teachers employ to measure and advance the skills and fitness levels of students in PE lessons. Assessment strategies in PE yield several benefits, enabling teachers to make informed instructional decisions, personalize learning experiences, and identify areas for improvement. Moreover, well-designed assessments promote student engagement, motivation, and a deeper understanding of concepts [4]. However, challenges can arise in designing valid assessments that effectively capture complex motor skills and ensure fairness for all students. Time constraints and the need for specialized training in assessment techniques can pose challenges to teachers [7]. The application of formative assessment strategies, which entail giving students constant feedback throughout the learning process, has been the subject of much research. Research indicates that formative assessment can improve student learning outcomes, particularly when it is combined with opportunities for self-reflection and goal setting [23]. Peer assessment, in which students judge the performance of one another, has been the subject of additional research. Peer assessment is a useful strategy for enhancing student learning, especially when used in combination with teacher feedback [38].

Furthermore, 893 teachers participated in a study [9] to explore how frequently they employed alternative assessment techniques in contrast to more traditional ones. The finding was that teachers used traditional assessment modes such as written assignments, exams with a closed-ended format, and quizzes. Teachers were also concentrated on alternative strategies such as performance evaluation and observation-based methods. Moreover, findings indicated that more experienced teachers tended to use alternative assessment strategies more frequently. [22] investigated the methods of classroom assessment used by 691 Botswana teachers and found that teacher-related factors such as prior teaching experience, academic credentials, and assessment preparation positively impacted teachers' abilities, convictions, and attitudes as well as their choice of suitable assessment strategies. [24] observed that teachers with more academic training and teaching experience had more desirable evaluation procedures. According to [29], teachers' usage of assessment strategies

and practices was influenced by their educational level and teaching experience, among other factors. Additionally, [35] found a link between better teaching techniques and assessment strategies and teachers' higher academic backgrounds. Lastly, [34] discovered that teachers' assessment procedures were influenced by the length of time they had been in the field of teaching.

Furthermore, [16] noted that teachers' assessment procedures were largely dictated by the specific goals they had for their classes. [1] asserted that professional development programs for teachers are essential for improving the knowledge and understanding of teachers regarding student assessment, especially in light of the continuous transition from summative to formative assessment strategies. Additionally, it has been observed by [35] and [24] that, teacher assessment practices are significantly impacted by assessment-focused training. However, such assessment strategies among PE teachers in Ghana are lacking in literature. Thus, this study sought to investigate PE teachers' knowledge of assessment strategies in Ghana.

The study is built on several assumptions about human learning and behaviour. The assumption is that individuals are active learners who think critically about what they learn, contrasting with the idea that people merely react to their surroundings [6]. Observational learning plays a central role, with behaviour being influenced by consequences. Bandura highlighted that people tend to imitate rewarding behaviours. Additionally, learning can occur through indirect experiences, such as watching movies or receiving verbal instructions, not just through direct interactions [6].

The theory is relevant in understanding how PE teachers develop assessment strategies. Teachers often adopt practices by observing colleagues or engaging in professional development. Bandura's emphasis on observational learning aligns with the idea that teachers may incorporate assessment practices they have witnessed being effective in their instructional settings. Additionally, the theory underscores the cognitive processes involved in acquiring knowledge, suggesting that teachers combine experiences, training, and exposure to various methods in assessing their students. Experienced teachers, having observed diverse strategies over time, often develop richer knowledge of assessment strategies. Similarly, teachers at different levels adapt assessment practices based on observed effectiveness in their specific contexts, aligning with Bandura's notion that individuals imitate rewarding or effective behaviours.

Research Questions

1. What is the influence of PE teachers' years of experience on their knowledge of assessment strategies?
2. What is the difference in assessment strategies employed by PE according to their educational level?

2. Methodology

This study employed explanatory sequential mixed method

design, applying both quantitative and qualitative data. Results of the quantitative was followed up with qualitative data [13, 14]. The qualitative data collected after the quantitative data helped to provide in-depth explanation to the results of the quantitative data.

Physical Education teachers in the Central Region of Ghana were the population for this study. There were 178 teachers teaching PE teachers in 2022/2023 academic year in all the Senior Secondary Schools (SHSs) in Central Region. Physical Education teachers in the region were considered for this study because these teachers possessed similar characteristics as PE teachers in the other fifteen regions in Ghana. This study employed a census sampling technique to select all teachers within the region to participate in the study. This was a small population, so all the 175 were targeted for the quantitative data collection period, but, 10 teachers were sampled through convenient sampling for the qualitative data.

This study used two research instruments, a questionnaire that collected quantitative data and a structured interview guide for qualitative data. Sections from the Physical Education Authentic Assessment Inventory [PEAAI] [28] and the Physical Education Assessment Questionnaire [PEAQ] [10] were adapted and modified to align with the study's objectives to measure teachers' knowledge of assessment strategies. The questionnaire consisted of three sections (sections A, B and C) and was entirely closed-ended. Section A consisted of four demographic questions: gender, educational level, number of years teaching PE, and years at the current school. Section B measured teachers' assessment strategies using 20 items on a five-point Likert-type scale with options as: Always (A), Often (O), Sometimes (S), Rarely (R), and Never (N), making respondents select their option based on their level of agreement. Section C, which assessed the knowledge of PE teachers on assessment, used a scale with the options: Agree (A), Strongly Agree (SA), Neutral (N), Disagree (D), and Strongly Disagree (SD). This section contained 15 items.

In person interview was conducted with the teachers, followed briefing on the nature and the reason for the interview or the research. The interview session was audio-recorded and lasted for about 20 minutes. During the interview session, teachers were allowed to express their opinions. This helped teachers to provide detailed explanation to the phenomenon under investigation.

To ensure validity of the instrument, two experienced PE teachers were contacted to critique the instrument. They reviewed the content thoroughly, identified issues and suggested corrections, which were used to refine the instrument for the study. To help determine the reliability of the instrument, pilot testing was done with teachers in a different region. Thereafter, the internal consistency was determined using Cronbach's alpha reliability coefficient, which produced an overall value of .897, with assessment strategies at .858 and knowledge at .848, respectively.

The pilot testing of the interview guide revealed issues relating to the clarity of questions and the order in which it was

presented. These problems were fixed with the support from the PE experts. Moreover, audit trail of the analysis and notes for peer review were kept. The thorough and detailed explanation of the setting, participants involved, and the transparency of the data collection and analysis revealed how valid the qualitative data was.

Before the research instruments were administered, consent to participate was obtained and a brief discussion was held with participants where the objectives of the study were explained. Moreover, participants were assured of the confidentiality and anonymity of the data [12]. Participants did not provide names and other information that could directly identify them. Moreover, each teacher signed informed consent, a form which was attached to the questionnaire. The questionnaire was converted into a Google online form and the link was shared with participants. This was also considered favorable because of how it could reach participants at their comfort. Several reminders were sent to encourage the teachers to fill the questionnaire. A return rate of 98.3% was obtained from the 175 participants who completed the questionnaire, which is sufficient for analysis [15].

Ten PE teachers were interviewed to provide qualitative data. These teachers were part of the participants who filled the questionnaire. During the interview the saturation point was obtained at the ninth interview. In order to ascertain the true saturating point, the researcher added another interview which repeated the same interview responses [20]. To eliminate bias during the interview, two MPhil students were trained and they conducted the interviews. Interviews were audio recorded with the permission from the participants.

At the end of the data collection, the online google form was pull down into the excel sheet. The data was then checked for completeness, and into SPSS for analysis. Respondents' demographic data was analyzed using frequency and percentage counts. Again, a binary logistic regression was employed to ascertain how Physical Education teachers' years of experience affect their knowledge of assessment strategies.

Thematic analysis method was to identify, analyze, and interpret meaningful patterns within the interview data [11]. A detailed coding manual with clear definitions was created to ensure standardized and consistent coding. To ensure the coding scheme was well understood, the researcher and two MPhils students practiced with the data sample from the pilot testing, resolving initial confusion and building a shared understanding. Using Cohen's Kappa to assess inter-rater agreement, the raters separately coded two transcripts while preserving the integrity of the analysis. The raters achieved a Kappa score of 0.79, which indicates strong agreement and high consistency among raters.

A manual transcription of the recorded interview data was made to familiarize with the data. Common phrases and sentences were assigned codes, which were then grouped into themes. The themes were then reviewed by both the researcher and the interviewees to ensure the accuracy of the data. Themes were then named and defined based on key

findings. Finally, the quantitative and qualitative data were integrated by comparing and contrasting the findings.

Also, to find out how different PE teachers' educational levels affected their assessment strategies, the One-Way ANOVA was used.

3. Results

Table 1. Influence of Years of Teaching Experience on Knowledge of the Use of Assessment Strategies.

Variable	B	S. E.	Wald	Df	Sig.
Experience			3.681	5	.596
6-10 years	.488	.412	1.406	1	.236
11-15 years	.270	.472	.326	1	.568
Step 1 ^a 16-20 years	.606	.523	1.342	1	.247
21-25 years	1.012	.941	1.157	1	.282
26 or more	.829	.708	1.371	1	.242
Constant	-.606	.227	7.132	1	.008

Reference category: ^aless than 6 years; $p < 0.05$

In this study, the concept of knowledge of assessment was measured on a categorical scale comprising high and low. Conversely, the number of years of teaching experience was categorized into several discrete levels, including those with less than 6 years of experience, 6-10 years, 11-15 years, 16-20 years, 21-25 years, and more than 25 years of teaching experience. Addressing the aforementioned research question entailed treating the knowledge of assessment variable as the dependent variable and the teachers' years of teaching experience as the independent variable. As experience was measured on a categorical scale, the first category served as the reference point for comparisons and analysis. The data was subsequently subjected to analysis using a binary logistic regression model (see Table 1).

The results in Table 1 indicated that years of teaching experience determined the knowledge of the use of assessment strategies among the teachers; specifically, knowledge of the use of assessment strategies among teachers with 6-10 years of teaching experience is approximately 48.8% higher compared to those teachers with less than 6 years of teaching experience ($\beta = .412$; $p = 0.236$). Furthermore, teachers with 11-15 years of teaching experience exhibited an increase in their knowledge of the usage of assessment strategies, approximately 27% when compared to their counterparts with less than 6 years of teaching experience ($\beta = .472$; $p = .568$). In addition, teachers with 16-20 years of teaching experience showcased a rise of 60.6% in their knowledge of the usage of assessment strategies compared with those having less than 6

years of teaching experience ($\beta = .523$; $p = .247$). Moreover, teachers who possess 21-25 years of teaching experience exhibited an increase of about 100.1% in their knowledge of the usage of assessment strategies when correlated to their colleagues with under 6 years teaching experience ($\beta = 1.157$; $p = 0.282$). Lastly, teachers with more than 26 years of teaching experience seem to experience an increase in their knowledge of the usage of assessment strategies, with approximately 82.9% compared with less than 6 years of teaching experience ($\beta = 1.371$; $p = .242$). Despite these notable percentages, there was no statistical significance in the ($p > 0.05$), suggesting that while there is an apparent trend, it is not statistically conclusive based on the findings.

The qualitative results from the follow-up interviews provided nuanced perspectives on the relationship between teaching experience and knowledge of the use of assessment strategies. The results obtained were presented in themes:

(1) Theme 1: Impact of teaching experience on the use of assessment strategies

Four participants emphasized the impact of teaching experience on the use of assessment strategies. Their insights are summarized and presented as follows:

Response of Participant 1:

"Experienced teachers perform better in assessments due to a heightened sense of responsibility and fear, which motivates meticulous use of assessment strategies"

Response of Participant 5:

"Accumulated expertise, teacher adaptations, and continuous reflective practice contribute to the relationship between experience and knowledge of the use of assessment strategies"

Response of Participant 8:

"Substantial experience can lead to a wealth of expertise in assessment strategies, but it is crucial to emphasize ongoing learning to adapt to changes"

(2) Theme 2: Quality and diversity of experience

During the interview, two participants discussed the significance of both quality and diversity of experience when using assessment strategies:

Response of Participant 6:

"The quality and diversity of experiences, along with professional development and a commitment to continuous learning, are crucial in shaping knowledge of use of assessment strategies."

Response of Participant 7:

"While experienced teachers can exhibit high levels of expertise, experience alone does not guarantee the effective use of assessment strategies."

(3) Theme 3: Fatigue and motivation in experienced teachers

Three participants highlighted the impact of fatigue and motivation on experienced teachers' use of assessment strategies:

Response of Participant 9:

"Although experienced teachers have a robust under-

standing of the use of assessment strategies, they may face fatigue and indifference towards refining their practices.”

Response of Participant 2:

“Experienced teachers may experience fatigue, but they can still maintain a high level of knowledge in using assessment strategies, even if their interest in trying new methods diminishes.”

(4) Theme 4: Continuous learning and adaptation

One participant underscored the need to recognize the evolving nature of insights in the educational system and acknowledged that experience alone may not be sufficient in adapting to these changes. This participant emphasized the ongoing commitment to staying informed about the use of assessment strategies:

Response of Participant 8:

“The evolving nature of knowledge and the need for experienced teachers to stay informed and committed to ongoing learning to adapt to changes on the use of assessment strategies.”

Table 2. Difference in Assessment Strategies Based on the Educational Levels.

Variables	Mean	SD	F-value	DF	P-value
B. Ed. Degree	72.79	8.77	.265	172	.767
BSc. Degree	72.39	10.95			
Master's Degree	73.91	11.83			
Total	72.75	10.82			

N=175.

Results in Table 2 explored the differences in assessment strategies among PE teachers according to their education levels. The ANOVA revealed no statistically significant differences in assessment strategies among PE teachers based on their educational level ($F(2, 172) = .265, p = 0.767$). The mean scores for assessment strategies were relatively similar across the three educational levels, with B. Ed. Degree ($M = 72.79, SD = 8.77$), BSc. Degree ($M = 72.39, SD = 10.95$), and Master's Degree ($M = 73.91, SD = 11.83$). Therefore, there are no differences in assessment strategies employed by PE teachers in SHS in the Central Region based on their educational levels.

4. Discussions

1. Influence of years of experience on knowledge of assessment strategies

The finding that teaching experience does not significantly influence the use of assessment strategies by Physical Edu-

cation (PE) teachers carries several implications. It challenges the common assumption that more years of teaching experience automatically equate to greater expertise in assessment. This calls into question the effectiveness of using the length of a teacher's career as a measure of their competence in assessment strategies. If experience does not directly correlate with improved knowledge in assessment, it raises concerns about the potential misalignment between conventional expectations and the actual capabilities of experienced teachers. Additionally, this lack of significant relationship undermines the value of professional development initiatives targeting experienced PE teachers, indicating the need for more specific, tailored training programs addressing gaps in assessment knowledge and skills.

The absence of a clear connection between teaching experience and proficiency in assessment strategies suggests that some experienced teachers may lack the necessary expertise to effectively implement assessment strategies, which could negatively impact student outcomes and the quality of PE education. This emphasizes the importance of revisiting teacher training and ongoing professional development to ensure that teachers are equipped with the skills to meet the evolving demands of assessment practices.

Social Cognitive Learning Theory [6] posits that learning is shaped by observation, imitation, and social influences. In this context, the study suggests that proficiency in assessment strategies may not rely solely on observing and modeling experienced teachers. Instead, it indicates that other factors, such as continuous learning, professional development, and personal commitment, are essential to teachers' understanding of assessment strategies. This aligns with Bandura's view of learning as a multifaceted process. Additionally, the findings support [36] research, which highlights the impact of contextual factors on assessment practices, suggesting that experience alone is insufficient for mastering assessment strategies.

Supporting studies, such as [3, 19, 33], also reinforce the idea that teaching experience does not guarantee a deep understanding of assessment strategies. These researchers emphasize the importance of ongoing professional development and educational background in mastering assessment practices. Furthermore, [37] note that collaborative and peer-assisted learning can enhance teachers' understanding of assessment, regardless of their years of experience.

The findings of this study align with [31], which found no significant gender differences in the assessment strategies of PE teachers. This congruence reinforces the observation that the theoretical knowledge teachers possess does not always translate into practical classroom implementation. The current study also concurs with [39] and [2], whose work indicated no significant relationship between teaching experience and assessment strategies, suggesting that the duration of teaching experience may not be a major factor in shaping assessment practices.

The study's results align with [17], who observed variabil-

ity in PE teachers' proficiency in assessment strategies, influenced by diverse educational backgrounds, training experiences, and professional development. This insight adds complexity to the understanding of PE teachers' assessment knowledge, emphasizing that teaching experience alone does not determine expertise in assessment.

In contrast, studies by [5] and [27] suggest a significant relationship between experience and assessment practices, where longer teaching careers are associated with better assessment knowledge. However, this finding contrasts with [30], who discovered that pedagogical or content knowledge does not always increase with teaching experience. These discrepancies highlight the complexity of factors influencing teachers' proficiency in assessment strategies, indicating the need for a more nuanced understanding of how teaching experience and expertise intersect in the field of assessment.

2. Significant differences in assessment strategies based on the educational level of Physical Education teachers in Senior High Schools

This research examined whether variations in the assessment strategies of PE teachers in Senior High Schools in the Central Region of Ghana were influenced by their educational levels. The One-Way ANOVA results revealed that there is no statistically significant difference in assessment strategies based on educational levels. This suggests a disconnect between higher education investments for PE teachers and their practical impact on teaching. If educational levels don't lead to significant improvements in assessment strategies, it raises concerns about the effectiveness of allocating resources toward advanced qualifications and professional development that do not directly enhance teaching. Such a disconnect may reduce the overall value of Physical Education and affect student experiences.

The lack of significant differences in assessment strategies by educational level could also diminish the value of advanced degrees in the field. Teachers who pursue higher education may feel discouraged if their qualifications do not result in better assessment practices. This may deter teachers from continuing professional development, hindering the growth of expertise within the PE community. To address this, it is crucial to understand why educational levels do not correlate with improved assessment strategies and adjust policies and interventions to ensure that educational investments align with better teaching practices and student outcomes.

The findings are consistent with Social Cognitive Learning Theory, which suggests that learning occurs through both personal experiences and observing others. The lack of significant differences between teachers of different educational levels implies that all teachers may be influenced by shared observational learning in the PE community. Similarly, Title's Theory for Classroom Assessment Practice, which advocates for systematic and goal-oriented assessment, suggests that educational level is not the primary determinant in shaping assessment strategies. The shared assessment practices across educational levels indicate a collective commitment to pur-

poseful and systematic assessment approaches, in line with Title's theory.

These results challenge conventional assumptions about the role of educational background in shaping assessment strategies, indicating that uniformity in teaching approaches exists despite variations in education levels. This finding opens opportunities for further exploration into the various factors influencing assessment practices in PE. Additionally, the study found no statistically significant relationship between the years of experience of PE teachers and their proficiency in assessment strategies. This challenges the assumption that more teaching experience leads to greater expertise in assessment, underscoring the need for targeted training and workshops on assessment strategies.

The study also debunked the belief that PE teachers with different educational levels use distinct assessment strategies. Regardless of their education, PE teachers in Senior High Schools in the Central Region showed similar approaches to assessment. These findings question the importance of educational levels in shaping assessment strategies and emphasize the need for a broader understanding of the factors influencing teaching practices in Physical Education.

Overall, this research plays a substantial role in bridging the existing knowledge vacuum regarding PE teachers' understanding of assessment strategies in Senior High Schools in the Central Region of Ghana, providing valuable insights into the dynamics of effective assessment practices in the field.

5. Conclusions

The study discovered a statistically insignificant effect between the years of experience of PE teachers and their proficiency in understanding assessment strategies. The findings of this study identified a lack of statistically significant differences in assessment strategies among Physical Education teachers, based on their educational levels in Senior High Schools. The study findings offer insightful observations into the influence of Physical Education teachers' years of experience on their knowledge of assessment strategies.

Lastly, the study establishes that there is no statistically significant disparity in assessment strategies among Physical Education teachers in Senior High Schools in the Central Region, regardless of their varying educational levels.

6. Recommendations

Heads of SHS in the Central Region and GES officials should continue investing in professional development for PE teachers, incorporating both traditional and innovative methods. Since experience does not significantly impact teachers' understanding of assessment strategies, training should be tailored to meet teachers' needs at different career stages.

Additionally, as educational levels do not affect assess-

ment strategies, professional development should be inclusive, valuing diverse expertise. Future research should explore factors influencing PE teachers' understanding of assessments and expand the study beyond the Central Region to compare regional differences in assessment strategies.

Abbreviations

GES	Ghana Education Service
PA	Physical Activity
PE	Physical Education
PEAAI	Physical Education Authentic Assessment Inventory
PEAQ	Physical Education Assessment Questionnaire
SHS	Senior High School
HPERS	Health Physical Education, Recreation and Sports

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Author Contributions

Sorkpor Richmond Stephen is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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