Project-Based Teaching in Senior High School English Teachers: Sustainability of Teacher Training, Technology Integration, and Assessment

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ABSTRACT

Project-Based Teaching (PBT) is regarded as an effective approach for developing students' 21st century competencies, yet sustaining teacher training, technology integration, and assessment practices remains a challenge for teachers. This study examined the school-level systemic challenges encountered by Senior High School English teachers and their perceived value of PBT in sustaining these three practices, and tested whether the two are significantly related. A quantitative descriptive-correlational design was used. Senior High School English teachers from public and private schools in Taguig City, Philippines who were currently teaching Effective Communication were surveyed during School Year 2026–2027. Census sampling targeted all 45 eligible teachers and 34 participated. Data were gathered through a researcher-made questionnaire anchored in the instrument of Aisyah and Novita (2025), rated on a 4-point Likert scale, and analyzed using frequency, percentage, median, interquartile range, net agreement rating, and Spearman's rank correlation. Respondents agreed that inadequate materials and budget, technology infrastructure and support deficiencies, and insufficient time for planning and preparation were challenges (grand median = 3.00, High; net agreement ratings of 47.46%, 44.71%, and 47.06%). Perceived value of PBT was very high in teacher training, technology integration, and assessment practices (grand median = 4.00; net agreement ratings of 100.00%, 100.00%, and 98.82%). Systemic challenges showed weak, negative, and statistically non-significant correlations with perceived value in teacher training ($\rho = -0.023$, $p = 0.896$), technology integration ($\rho = -0.237$, $p = 0.176$), and assessment practices ($\rho = -0.209$, $p = 0.235$), and the null hypothesis was not rejected. Findings suggest that teachers' perceived value of PBT remained resilient despite the reported challenges, and because the study measured beliefs and conditions at the time of data collection rather than actual PBT implementation over time, future studies should explore whether this belief translates into sustained classroom practice.

Keywords: Project-Based Teaching, Systemic Challenges, Teacher Training, Technology Integration, Assessment

INTRODUCTION

Background of the Study

In 21st century learning, a shift from traditional teaching to modern teaching methods is seen as education develops over time. While the traditional method provides a solid foundation for learners, modern approaches are considered to offer a more innovative way of teaching and to inspire learners (Falasi, 2024). Project-Based Teaching (PBT) refers to the method in which teachers plan, guide, and assist students in the classroom in carrying out project-based learning (Wang & Zhang, 2025; Grossman et al., 2019). It is a pedagogy through which educators design meaningful instructional activities by putting classroom teaching within real-world situations or contexts.

Republic Act 10533, known as the Enhanced Basic Education Act of 2013, in conjunction with DepEd Order No. 21, s. 2019, gives guidelines that reinforce the use of active and collaborative instructional strategies that promote analytical thinking, problem solving and 21st century competencies. Project-based principles align with Sustainable Development Goal 4 (Quality Education) and are realized in classroom practice through PBT, wherein teachers translate these project-based principles into instructional strategies, project production, and assessment practices. The approach is reported to enhance students' core literacy and higher order thinking skills and to be better than traditional teaching models (Zhang & Ma, 2023), and when supported by technology, it can enhance teachers' professional learning and deepen their conceptual understanding (Al-Kamzari & Alias, 2025).

The project-based approach earned acknowledgement for development of 21st century skills. However, questions and challenges remain in sustaining teacher training, technology integration, and assessment despite the reported effectiveness of the approach (Evenddy et al., 2023). Studies have identified, recognized barriers and challenges such as insufficient time for planning and preparation, inadequate instructional materials and budget constraints, and limited technology infrastructure and support. Evenddy et al. (2023) reported that, despite the positive effects associated with the project-based approach, teachers continue to encounter challenges in readiness, complexity of assessment, and time and resource constraints. This study therefore examined the school-level systemic challenges encountered by Senior High School English teachers and their perceived value of PBT in sustaining teacher training, technology integration, and assessment practices.

RELATED LITERATURE

Material and financial barriers. Resource allocation plays a critical part in PBT because it directly influences teachers' capacity to design, facilitate, and sustain project-oriented instruction. Suegay (2022) recommended that the Department of Education allocate adequate resources to minimize teachers' workload, and Resaba and Gayeta (2021) identified the sufficiency of funds as a main concern in project-based contexts. Persistent shortages of materials and limited funding remain major barriers (Veliganio et al., 2024), and studies across regions and subjects highlight how shortages of materials, limited budgets, and financial barriers weaken teachers' ability to conduct project-based activities (Bhandari, 2021; Taha, 2021; Lopez, 2021). The effective integration of a project-based approach also depends heavily on institutional and administrative support (Lee & Galindo, 2021; Monta & Perdio, 2025; Yang et al., 2021).

Teacher perception and training effectiveness. Teacher training provides a significant impact on the implementation of PBT. Professional development aligned with teachers' specific needs contributes to more effective and sustainable teaching practices (Veliganio et al., 2024), and teachers who recognize the benefits of the project-based approach still require support in putting it into practice (Haatainen & Aksela, 2021). Most educators have positive perspectives about project-based, yet they continue to encounter challenges such as limited training, lack of resources, and classroom management (Aisyah & Novita, 2025). Despite the consistent acknowledgement of improved student engagement and learning, teachers are unable to fully implement project-based approaches due to limited preparation time, insufficient resources, and limited technology infrastructure (Moussaoui & Erguig, 2024). Effective implementation therefore relies not only on teachers' positive perceptions but also on the institutional conditions that support their instructional practices, and sustained professional development and collaborative learning structures strengthen teachers' confidence and perceived value of PBT (Laela et al., 2025).

Time for planning and preparation. Effective teaching requires careful planning, and the time that planning demands makes it a critical challenge in implementing project-based approaches (Haatainen & Aksela, 2021; Taha, 2021). Planning and delivery both require an extensive amount of time, which makes teachers' workload heavier (Mai & Trang, 2022). Teachers are not given enough time to carry out project-based work properly, not because they do not balance time efficiently but because of system problems, resulting in heavy workloads and reduced time for project-based instruction (Moussaoui & Erguig, 2024). Planning time, insufficient strategy monitoring, and inadequate teacher training have also been reported as reasons why project-based approaches are not utilized in the classroom (Yang et al., 2021). Overall, the literature reveals a gap between teachers' perception of project-based teaching and the realities of school-level constraints

Theoretical and Conceptual Framework

The study was guided by the Technological Pedagogical Content Knowledge (TPACK) framework and Social Cognitive Theory. TPACK, developed by Mishra and Koehler (2006), proposes that effective teaching with technology requires the integrated application of three core knowledge domains: content knowledge, pedagogical knowledge, and technological knowledge (Warr & Mishra, 2022). In this study, TPACK served as an interpretive lens for the knowledge English teachers need to design, deliver, and assess technology-supported PBT. Social Cognitive Theory explains human behavior as the product of continuous, reciprocal interaction between personal factors, behavioral patterns, and environmental influence, with self-efficacy at its center (Bandura, 1997; Schunk & DiBenedetto, 2022). In this study, the personal factor was understood through teachers' perceived value of PBT, that is, their beliefs about its usefulness, relevance, and effectiveness, while the environmental factor was understood through the systemic challenges teachers encountered in schools, such as resource, infrastructure, and time constraints. Together, TPACK helped explain what teachers needed to know to carry out PBT, while Social Cognitive Theory helped explain whether teachers' beliefs and their school conditions support continuing it.

The Input-Process-Output (IPO) model served as the conceptual framework (Figure 1); the input stage includes the school-level systemic challenges (inadequate materials and budget constraints, limited technology infrastructure and support deficiencies, and insufficient time for planning and preparation) and teachers' perceived value of PBT in the areas of teacher training, technology integration, and assessment practices. The process was a quantitative approach using a descriptive-correlational method, beginning with the administration of a questionnaire survey and analysis using Spearman's correlation analysis. The output consists of the study's findings and educational recommendations.

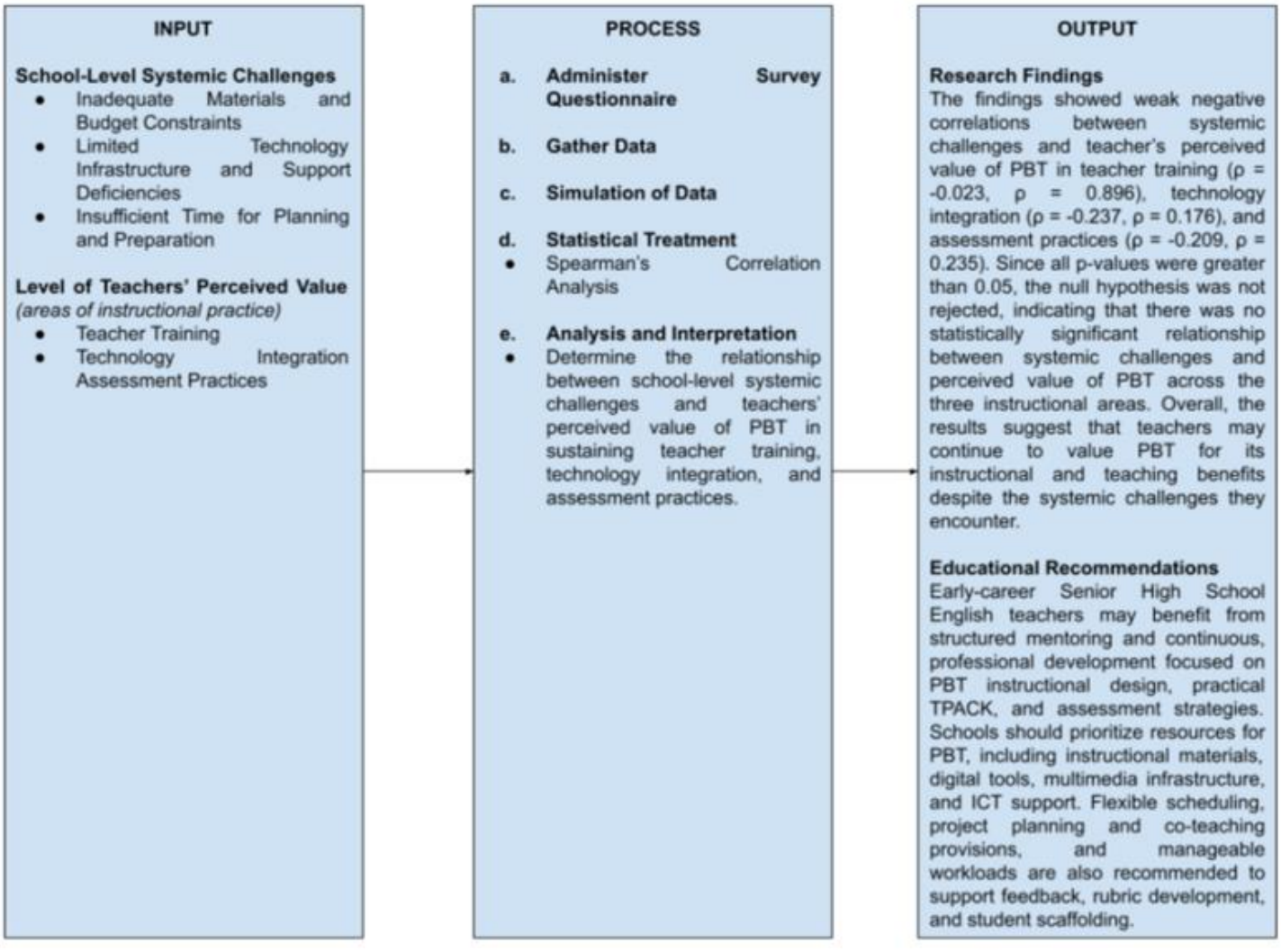


Figure 1: Conceptual Framework of the Study

Objectives and Hypotheses

This study examined the practices and challenges of Senior High School English teachers in relation to PBT. Specifically, it aimed to answer the following questions: (1) What are the demographic profiles of the Senior High School English teachers in terms of age, years of service, and school affiliation? (2) What school-level systemic challenges are encountered in sustaining PBT, particularly in relation to inadequate materials and budget constraints, limited technology infrastructure and support deficiencies, and insufficient time for planning and preparation? (3) What is the level of teachers' perceived value of PBT in the areas of teacher tra-

ining, technology integration, and assessment practices? (4) Is there a significant relationship between school-level systemic challenges and the perceived value of PBT in sustaining teacher training, technology integration, and assessment practices? The study tested the following null hypothesis:

H_0: there is no significant relationship between school-level systemic challenges and the perceived value of PBT in sustaining teacher training, technology integration, and assessment practices

METHODOLOGY

Research Design

This study utilized a quantitative descriptive-correlational research design to examine the relationship between school-level systemic challenges and teachers' perceived value of PBT.

Locale, Population, and Sampling

The population consisted of Senior High School English teachers from public and private schools in Taguig City, Philippines during School Year 2026–2027 who were currently teaching Effective Communication, formerly Oral Communication and Reading and Writing, which were integrated into a single core subject. Census sampling was employed targeting all 45 eligible Senior High School English teachers. The questionnaires were distributed to all of them and some teachers were unavailable during data collection, resulting in 34 actual respondents. The respondents came from six public and two private schools (Table 1).

Table 1: Distribution of Respondents by School

School	Number of Respondents
Public:	
School A	5
School B	9
School C	2
School D	1
School E	6
School F	3
Private:	
School G	3
School H	5
TOTAL	34

Note. School codes are listed in order in which they appear in the thesis and not ranked.

Research Instrument

The study used a researcher-made questionnaire anchored in the instrument of Aisyah and Novita (2025). The questionnaire has three parts: (1) the demographic profile (age, years of service, and school); (2) the school-

level systemic challenges encountered; and (3) the level of perceived value of PBT in sustaining teacher training, technology integration, and assessment practices. Items in the second and third parts were rated on a 4-point Likert scale with no neutral point, as this encourages respondents to take a position. A median score of 3.25 to 4.00 was interpreted as Strongly Agree, reflecting a very high level of agreement; 2.50 to 3.24 as Agree, reflecting a high level; 1.75 to 2.49 as Disagree, reflecting a low level; and 1.00 to 1.74 as Strongly Disagree, reflecting a very low level of agreement.

Data Collection and Ethics

The researchers submitted an official request, along with necessary documents for ethical clearance, and ethical approval was obtained from the relevant university institutions, including the PUP University Research Ethics Committee (UREC) and from the school authorities. After the ethical approval, informed consent was obtained voluntarily, and respondents were informed of the purpose, scope, and rights as well as the possible risks and benefits of the study. The researchers administered questionnaires to respondents via Google Forms or paper copies, according to the preferences of the respondents. In compliance with ethical principles such as confidentiality of identity, privacy, and non-maleficence, all the identities of respondents were protected, their answers were only used for academic purposes, secure handling of data was ensured, and reporting of results was done honestly.

Data Analysis

Frequency and percentage distributions were used to describe the respondents' age, years of service, and school. The median and interquartile range (IQR) were used to describe the central tendency and variability of the Likert-scale responses, which are ordinal data. The net agreement rating was used because it was likely to yield the same result as the median as the basis for verbal interpretation, and it was therefore suitable for substantiating the median results. Spearman's correlation analysis was applied to test the hypothesis.

RESULTS

Respondents Profile

Among the 34 respondents, the most represented age group was 26–30 (26.47%) and the least represented was 51–55 (2.94%). Most of the respondents (38.24%) had served 1 to 5 years, while the least represented groups were 11 to 15 years and 16 to 20 years (2.94% each). With regard to school affiliation, the largest group of respondents (26.47%) was affiliated with School B, while School D had the lowest representation (2.94%).

Table 2: Respondents Profile (N=34)

Category	Frequency (f)	Percentage (%)
Age		
26-30 years old	9	26.47%
51-55 years old	1	2.94%
Years of Service		
1 to 5 years	13	38.24%
11 to 15 years	1	2.94%
16 to 20 years	1	2.94%
School		
School B	9	26.47%
School D	1	2.94%

Note. The table presents selected categories only. Percentages are computed from the total number of respondents (N = 34).

Systemic Challenges Encountered by the Respondents

Table 3 presents the respondents' level of agreement on the systemic challenges they encountered. Across three areas, every indicator obtained a median of 3.00, interpreted as Agree, with IQR values ranging from

1.00 to 2.00. Under inadequate materials and budget constraints, the grand median was 3.00 (IQR = 1.25; net agreement rating = 47.46%); the highest net agreement rating was for limited budget hindering the acquisition of necessary PBT materials and resources (76.47%), and the lowest was for insufficient teaching materials adapted to PBT needs (17.65%). Under technology infrastructure and support deficiencies, the grand median was 3.00 (IQR = 1.80; net agreement rating = 44.71%); the highest net agreement rating was for inadequate technology infrastructure limits opportunities for capacity-building initiatives (58.82%), and the lowest was for limited access to digital tools (35.29%). Under insufficient time for planning and preparation, the grand median was 3.00 (IQR = 1.85; net agreement rating = 47.06%); the highest net agreement rating was for lack of time preventing teachers from designing projects and assessments aligned to the intended curriculum (52.94%), and the lowest was for time constraints hindering adequate project planning and design (41.18%). The net agreement ratings of all indicators were positive, which means that more respondents agreed than disagreed.

Table 3: Respondents' Level of Agreement on the Systemic Challenges Encountered

Area of Instructional Practice	Grand Median	IQR	Verbal Interpretation	Net Agreement Rating	Highest Agreement Rating	Lowest Agreement Rating
Inadequate materials and budget constraints	3	1.25	Agree	47.46%	Limited budget hinders the acquisition of necessary PBT materials and resources. (76.47%)	Teaching materials (i.e., laptops, televisions, printers, audio tools) tailored to PBT needs are insufficient. (17.65%)
Technology infrastructure and support deficiencies	3	1.8	Agree	44.71%	Inadequate technology infrastructure limits opportunities for capacity-building initiatives (58.82%)	Limited access to digital tools prevents teachers from effectively using technology to support their projects (35.29%)
Insufficient time for planning and preparation	3	1.85	Agree	47.06%	Lack of time prevents teachers from designing projects and assessments aligned to the intended curriculum (52.94%)	Time constraints hinder adequate project planning and design (41.18%)

Note. Medians were interpreted as Strongly Disagree (1.00-1.74), Disagree (1.75-2.49), Agree (2.50-3.24), and Strongly Agree (3.25-4.00).

Table 4 presents the respondents' perceived value of PBT. Every indicator obtained a median of 4.00, interpreted as Strongly Agree. In teacher training, the grand median was 4.00 (IQR = 0.60), and all five

indicators obtained a net agreement rating of 100.00%. In technology integration, the grand median was 4.00 (IQR = 1.00), and all five indicators likewise obtained 100.00%. In assessment practices, the grand median was 4.00 (IQR = 1.00), with a grand net agreement rating of 98.80%; four indicators obtained 100.00%, and the statement on designing assessments aligned to the intended curriculum obtained 94.12%, the lowest among the indicators.

Table 4: Respondents' Perceived Value of PBT in Teacher Training, Technology Integration, and Assessment Practices

Area of Instructional Practice	Grand Median	IQR	Verbal Interpretation	Net Agreement Rating	Highest Agreement Rating	Lowest Agreement Rating
Teacher Training	4	0.6	Strongly Agree	100.00%	All five indicators obtained the same rating (100.00%)	
Technology Integration	4	1	Strongly Agree	100.00%	All five indicators obtained the same rating (100.00%)	
Assessment Practices	4	1	Strongly Agree	100.00%	Four of five indicators (100.00%)	I design assessments aligned to the intended curriculum that guide students in achieving the learning objectives

Note. Medians were interpreted as Strongly Disagree (1.00-1.74), Disagree (1.75-2.49), Agree (2.50-3.24), and Strongly Agree (3.25-4.00).

Table 5 presents the Spearman rank correlation between the systemic challenges encountered and the perceived value of PBT across the three areas of instructional practice. In Teacher Training, the correlation was negligible and negative ($\rho = -0.023$, $p = 0.896$). In Technology Integration ($\rho = -0.237$, $p = 0.176$) and Assessment Practices ($\rho = -0.209$, $p = 0.235$), the correlations were weak and negative. In all three areas, the p-values were greater than the 0.05 level of significance; thus, the null hypothesis was not rejected. This means that there was no statistically significant relationship between the systemic challenges encountered and the perceived value of PBT in any of the areas. Although the correlations were negative indicating a slight tendency for respondents who reported more challenges to perceive less value in PBT these relationships were too weak to rule out chance.

Table 5: Spearman Rank Correlation between the Systemic Challenges Encountered and the Perceived Value of PBT

Paired Variables	Spearman Correlation (ρ)	p-value	Verbal Interpretation	Decision	Remarks
Systemic Challenges Encountered and Perceived Value of PBT in Teacher Training	ρ = -0.023	0.896	Negative Weak Correlation	Failed Reject H0	Not Statistically Significant
Systemic Challenges Encountered and Perceived Value of PBT in Technology Integration	ρ = -0.237	0.176	Negative Weak Correlation	Failed Reject H0	Not Statistically Significant
Systemic Challenges Encountered and Perceived Value of PBT in Assessment Practices	ρ = -0.209	0.235	Negative Weak Correlation	Failed Reject H0	Not Statistically Significant

Note N = 34. Correlation strength was interpreted as negligible and weak.

DISCUSSION

Demographic Profile of the Respondents. The majority or most of respondents or participants belong to the 26–30 years old age bracket (26.47%), reflecting wider pattern in education here in the Philippines where the Senior High School teaching work force is composed to a great extent of relatively young and foundational educators (Aquino, 2023; Olvido et al., 2024; Villaruz et al., 2022). This is further supported by the years of service data, as most respondents (38.24%) had rendered only 1 to 5 years in the profession, reinforcing the picture of a predominantly early-career teaching population. With regard to school affiliation, the respondents originated from eight public and private schools in Taguig City. The largest group came from the School B, which accounted for 26.47% of the respondents.

School-Level Systemic Challenges Encountered. Throughout the three different areas, the challenges were stated to be, among others, the lack of materials and financial means, the limited technology infrastructure and support as well as the lack of time for planning and preparation. Grand median for each of the three areas under study was 3.00 (Agree). So even though the described problems are real in the schools of the participants, they do not seem to be the biggest problem in their view. Among the indicators under materials and budget constraints, the limited budget for acquiring materials needed for PBT received the highest level of agreement at 76.47%. Within technology infrastructure, the restriction of capacity-building opportunities due to inadequate infrastructure received the highest agreement (58.82%). Within insufficient time, the difficulty of designing curriculum-aligned projects and assessments due to lack of time received the highest agreement (52.94%).

Perceived value of PBT. In contrast to moderate agreement recorded for systemic challenges, respondents' perceived value of PBT across all three instructional areas registered a grand median of 4.00 interpreted as Strongly Agree. Teacher training and technology integration both obtained a net agreement rating of 100.00% across all indicators, while assessment practices obtained a grand net agreement rating of 98.80%. These results reflect an overwhelmingly positive and near-unanimous belief among respondents that PBT meaningfully contributes to their professional growth, their instructional practices, and their capacity to design, deliver, evaluate learning experiences for their students.

Relationship between systemic challenges and perceived value. Spearman's rank correlation analysis showed weak negative and statistically non-significant correlations between systemic challenges as well as perceived value of PBT across all three instructional areas: teacher training ($\rho = -0.023$, $p = 0.896$), technology integration ($\rho = -0.237$, $p = 0.176$), and assessment practices ($\rho = -0.209$, $p = 0.235$). Since all p-values exceeded the 0.05 level of significance, the null hypothesis was not rejected in all three instances, showing that the systemic challenges the respondents encountered were not significantly related to how much value they placed on Project-Based Teaching

CONCLUSION AND RECOMMENDATION

Conclusion

Although teachers experienced materials and budget, technology infrastructure, and time constraints as moderate barriers to PBT, they still regarded it as highly valuable. The relationship between these challenges and perceived value was weak, negative, and not statistically significant, so the null hypothesis was not rejected meaning teachers' valuing of PBT was therefore not significantly associated with the challenges they faced.

Recommendations

Results suggest that early-career Senior High School English teachers, ages 26–30 with 1–5 years of experience, may benefit from structured mentoring programs during the annual planning phase to build PBT instructional design capacity. School-level budget planning should give priority to project-based teaching essentials such as instructional materials, basic digital tools, and multimedia infrastructure. Findings point to a

broader need for flexible scheduling and clearer provisions for project-based planning, co-teaching, and assessment, and suggest a need for sustained, long-term investment in school technology infrastructure and ICT support.

A qualitative follow-up study is recommended to further explore why teachers continue to value PBT positively despite the systemic challenges they reported, and to track the implementation of PBT across school years to directly examine whether resilient belief translates into sustained practice. Broaden the study to a more geographically varied sample of Senior High School English teachers across different regions of the Philippines, to examine whether this pattern of resilient belief amid systemic constraint holds true beyond the schools examined in this study.

LIMITATIONS

The primary source of data was a survey questionnaire prepared by the researchers. Although eligible 45 teachers were targeted through census sampling, only 34 participated because some teachers were unavailable during data collection, and this gap between the intended and actual number of respondents is acknowledged as a limitation. Other limitations include potential self-report bias, as the data rely on teachers' self-reported information and practices; sample limitations because the study covered selected schools, which may restrict the generalizability of the findings to other areas, grade levels, and educational contexts; and response-related limitations, as participation depended on teachers' willingness to respond. Additionally, the study measured teachers' perceived value of PBT and the systemic challenges they encounter at the time of data collection, and findings regarding sustainability should therefore be understood as reflecting the beliefs and conditions associated with sustained practice and not as evidence of actual PBT implementation over time.

ETHICAL APPROVAL

The study was reviewed and approved by the PUP University Research Ethics Committee (UREC) on April 6, 2026, under UREC Code No. 2026-0418.

DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE

Generative AI tools supported certain stages of this study, specifically in searching the literature, verifying citations, and organizing data and concepts. The authors checked all sources against the original publications and made all decisions regarding the research design, analysis, interpretation, and conclusions.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY

The data supporting this study's findings can be obtained from the corresponding author upon reasonable request and in order protect respondents' privacy and confidentiality, the data are not made publicly available.

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