

Teaching Capacity Towards Improved Health Education Classroom Instruction Framework

Rhea J. Torres

Graduate School Department, Philippine Christian University, Dasmariñas, Cavite, Philippines

Author Email: rhea.torres@yahoo.com

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Abstract. Health Education is an integral part of a school health program, which is critical in fostering students' well-being and developing essential life skills for informed decision-making regarding health-related matters. This study examined the effect of Health Education teachers' teaching capacity—content knowledge, critical thinking skills, and disposition through problem-solving pedagogy—on effective instructional delivery. It also investigated the influence of a conducive classroom physical environment on teaching capacity and instructional delivery. A descriptive analysis research design was employed with 104 participants, consisting of 52 junior high school Health Education teachers and 52 school heads from private schools in Cabuyao and Santa Rosa, Laguna. Data were collected using structured questionnaires. Findings revealed a significant positive relationship between teaching capacity and effective instructional delivery in Health Education. Furthermore, the study established that a conducive physical environment significantly influenced teaching capacity and the effectiveness of instructional delivery. These results underscore the importance of strengthening teacher competencies and maintaining supportive physical learning environments to optimize instructional outcomes in Health Education. It is recommended that future research further explore how teaching capacity impacts instructional methods, classroom management, and assessment strategies, all of which contribute to student achievement. Likewise, additional studies on the physical classroom environment could provide deeper insight into its lasting effects on academic success, instructional quality, and teachers' and students' overall well-being and motivation.

Keywords: Classroom environment; Health education; Instructional delivery; Teacher effectiveness; Teaching capacity.

1.0 Introduction

Health Education has become an increasingly vital component of basic education, particularly in developing countries like the Philippines, where public health challenges and disparities remain prevalent. As part of the K to 12 curriculum, Health Education is delivered through the MAPEH subject area. It is designed to cultivate health awareness, disease prevention, nutrition literacy, and positive lifestyle behaviors among students. Despite its critical role in shaping lifelong wellness, instructional delivery in Health Education often fails to meet its intended goals due to persistent issues related to teacher competence and the physical learning environment. These challenges are particularly evident in secondary schools, where many educators lack specialized training in Health Education, and classroom conditions are often not conducive to effective teaching and learning.

Central to improving instructional quality is the concept of teaching capacity. This includes a teacher's subject matter content knowledge, pedagogical skills, instructional disposition, and participation in professional development. Existing literature strongly suggests that teaching capacity significantly determines instructional effectiveness, particularly in content areas that demand dynamic and student-centered approaches. Werimba (2024) emphasized that teachers with strong pedagogical foundations and adaptive classroom strategies deliver instruction more effectively and positively influence student outcomes. Similarly, studies by Ogundiran and Olafare (2023) and Ventista and Brown (2023) identified teaching capacity as a predictor of academic achievement, while Levitan (2022) and Manzano (2022) noted that subject matter expertise fosters more coherent and engaging instruction.

In the context of Health Education, content mastery, critical thinking, and problem-solving pedagogy are especially relevant. Teachers who employ these strategies tend to promote deeper student engagement, participation, and knowledge retention (Ezeddine et al., 2022; Pathak, 2024; Singh, 2023). Magaji (2021) further highlighted that the success of such pedagogies depends on a teacher's ability to apply prior knowledge, facilitate collaboration, and utilize timely feedback—core elements of teaching capacity. However, many Philippine teachers delivering Health Education either lack discipline-specific training or receive minimal support through professional development, limiting their capacity to implement these practices effectively.

In addition to teacher-related variables, the physical classroom environment also plays a crucial role in shaping instructional delivery. Research shows that lighting, space, air quality, seating arrangement, and instructional materials significantly influence teaching behaviors and student learning outcomes (Ahmed et al., 2020; Akinyemi et al., 2024). In particular, Fisher and Frey (2022) emphasize that classroom design affects teachers' ability to manage the class, move freely, and engage students. Within the Philippine setting, many classrooms suffer from overcrowding, inadequate ventilation, insufficient resources, and poor maintenance—factors that can severely hinder the delivery of interactive and participatory Health Education lessons.

While the importance of teaching capacity and classroom environment has been independently established, limited empirical research—particularly in the Philippine context—explores their interrelationship and combined influence on instructional delivery in Health Education. Most existing studies examine these factors in isolation, neglecting how the classroom environment may support or constrain a teacher's effective teaching. This oversight represents a critical research gap, especially in a country where disparities in teacher qualifications and school infrastructure are known to affect educational quality.

Addressing this gap is both timely and essential. Health Education serves as a key mechanism for fostering informed health behaviors, yet its impact depends heavily on the quality of instruction. Understanding how teaching capacity interacts with the physical environment can inform the design of more targeted and context-responsive teacher development programs and improvements in school facilities. Furthermore, such knowledge can guide educational policymakers in aligning instructional support systems with the specific needs of Health Education teachers.

2.0 Methodology

2.1 Research Design

A descriptive-correlational research approach was adopted to investigate the extent of association between three primary variables. Specifically, teaching capacity was identified as the independent variable (IV), effective instructional delivery in Health Education as the dependent variable (DV), and the conducive classroom physical environment as the third variable, analyzed in terms of its potential influence on both the IV and DV. The correlational design was deemed appropriate for determining the nature and strength of relationships among these variables without manipulating them (Eseadi & Diale, 2025). The study sought to describe the characteristics of each variable and assess the extent to which the independent variable (teaching capacity) affects the dependent variable (instructional delivery). Moreover, it explored how the third variable (classroom environment) potentially impacts teaching capacity and instructional delivery. Data was collected through three (3) questionnaires to assess each variable's levels and their interconnections. Prior research investigating teaching capacity has commonly adopted a correlational design, reporting significant associations between teaching capacity and student academic outcomes. These studies emphasize the influence of teacher knowledge,

pedagogical skills, and professional behaviors on learning processes and outcomes (Chen, 2021; Lawal et al., 2023; Le et al., 2024; Lüftenegger & Muth, 2024; Rosas et al., 2020; Schildkamp et al., 2020; Vosniadou et al., 2024). These findings align with and support the research design implemented in this study.

2.2 Participants and Sampling Technique

The target population for this study was junior high school health education teachers and their respective school heads (principals) from private secondary schools in the cities of Cabuyao and Santa Rosa, located in the province of Laguna, Philippines. A total of 104 participants were selected, consisting of 52 Health Education teachers and 52 school heads. The sample was drawn using a purposive-convenience sampling technique. This approach was chosen to ensure that only participants directly involved in implementing and supervising Health Education instruction were included in the study. The sampling was purposive in that it focused on schools offering Health Education at the junior high school level, and it was convenient in that it selected participants based on accessibility and willingness to participate within the specified geographic area.

Inclusion criteria required that teacher participants: (a) were currently teaching Health Education to junior high school students; (b) had at least one year of teaching experience in the subject; and (c) were employed in private high schools within the designated cities. School head participants were required to be: (a) the officially designated principal or head administrator of the school; and (b) directly responsible for supervising academic instruction, including Health Education. Exclusion criteria involved the omission of public-school teachers and administrators and those from other subject areas or grade levels to maintain the focus on Health Education instruction in the private school setting.

2.3 Research Instrument

A researcher-made questionnaire served as the primary research instrument for this study. It was designed to gather relevant data to ensure accuracy and validity (Aithal & Aithal, 2020). The questionnaire consisted of three parts: (1) Teaching Capacity assessed subject matter content knowledge, critical thinking skills, and pedagogical disposition. Questions under the subject matter content knowledge were adapted from the MATATAG Curriculum – P.E. and Health, Department of Education; (2) Effective Instructional Delivery in Health Education, based on self-reported performance; and (3) Conducive Classroom Physical Environment, based on the participants' perceptions.

To ensure content validity, the questionnaire was subjected to expert evaluation using the Carter V. Good and Douglas B. Scates (1972) validation rating scale, which includes nine evaluative criteria rated on a scale from 1 (poor) to 5 (excellent) (Oducado, 2020). Three evaluators – two school principals and one Department of Education supervisor – reviewed all items in the questionnaire. The overall average score was 4.63, interpreted as "Excellent," thus confirming the instrument's validity. Reliability was measured using Cronbach's Alpha, with a threshold of 0.70 indicating acceptable internal consistency (Martita et al., 2024). The section on Teaching Capacity yielded the following alpha coefficients: 0.854 for subject matter content knowledge, 0.846 for critical thinking skills, and 0.816 for pedagogical disposition. The composite reliability score for this section was 0.839, indicating good reliability. The section on Effective Instructional Delivery in Health Education achieved a coefficient of 0.914, while the section on the Conducive Classroom Physical Environment obtained a coefficient of 0.919. These values indicate excellent internal consistency for both constructs. Prior to full implementation, the instrument was pilot-tested on 15 non-sample participants who met the inclusion criteria but were not included in the actual study. The pilot test allowed for item clarity and format refinement, ensuring that the instrument's final version was comprehensible and context-appropriate for the target respondents.

2.4 Data Gathering Procedure

Data collection began following the official approval of the research schedule. Initially, the questionnaire was administered to a pilot group of 15 non-sample participants who satisfied the inclusion criteria but were not part of the study. This pilot test facilitated assessing and confirming the instrument's reliability and validity. Upon establishing the adequacy of the research instrument, the primary survey was conducted with a total of 104 respondents – comprising 52 junior high school Health Education teachers and 52 school heads (principals) – from selected private high schools located in Cabuyao and Santa Rosa, Laguna.

The data collection was carried out using a hybrid approach, combining face-to-face and online administration

modes. Questionnaires were personally distributed and retrieved from available participants on-site, while digital copies were sent to those who were not physically present. Online distribution was facilitated via email or other secure platforms, with detailed instructions provided to ensure consistency in responses across formats. This hybrid approach was adopted to maximize response rates while accommodating the varying availability and accessibility of the participants.

All participants were briefed on the purpose of the study and were assured that their responses would remain confidential and their participation would be anonymous. Ethical standards were strictly observed, and all communication regarding the study was conducted with transparency and integrity. The methods, instruments, and procedures used for data collection, analysis, and interpretation were fully disclosed to ensure the accuracy and credibility of the findings. The collected data were carefully encoded and subsequently subjected to appropriate statistical treatments for analysis and interpretation.

2.5 Data Analysis Procedure

The study employed quantitative data analysis techniques to address the specific objectives and test the hypotheses formulated. The data collected from the questionnaires were encoded, organized, and subjected to appropriate statistical procedures using a statistical software package. Only data from validated and reliability-tested instruments were analyzed to ensure the validity and reliability of the findings. The internal consistency of the research instrument was confirmed through Cronbach's Alpha coefficients, all of which exceeded the minimum threshold of 0.70, indicating acceptable to excellent reliability. The trustworthiness of the data was further supported by ethical data handling, transparent reporting of procedures, and adherence to established quantitative research standards.

For descriptive analysis, the weighted mean and standard deviation were used to summarize responses related to teaching capacity, effective instructional delivery in Health Education, and the conduciveness of the classroom physical environment. To determine whether the mean responses were significantly different from the test values or one another, one-sample t-tests and paired-samples t-tests were performed. Cohen's d statistic was also calculated to determine the magnitude of the observed effects, thereby providing an effect size estimate. To address the inferential aspects of the study, multiple regression analysis was employed to determine the extent to which teaching capacity predicts effective instructional delivery in Health Education, and how the conducive classroom physical environment influences teaching capacity and instructional delivery. Additionally, Analysis of Variance (ANOVA) was used to assess the regression models' overall statistical significance and determine whether the relationships among the variables were meaningful at the population level. These statistical procedures provided a comprehensive analysis of the relationships among the study variables and contributed to the rigor and objectivity of the research findings.

2.6 Ethical Considerations

International studies have previously examined teaching capacity and classroom instruction, providing valuable insights into their influence on educational outcomes. Building on this foundation, the present study sought to expand the scope of existing research by exploring these constructs within the Philippine context and incorporating additional variables—such as the physical classroom environment—that may further influence instructional delivery. This continued inquiry enriches the scholarly literature by offering context-specific perspectives and potentially generalizable findings. To uphold the highest ethical standards in research, all participants provided informed consent before participating. Each participant received a written explanation outlining the purpose of the study, the estimated duration of the questionnaire, and the voluntary nature of their participation. The information sheet also emphasized that participants were free to decline or withdraw from the study without penalty or obligation to justify.

Confidentiality and anonymity were strictly observed. No personally identifiable information was collected, and all responses were coded to ensure that individual data could not be traced back to specific participants. The collected data were stored securely and used solely for academic and research purposes. Furthermore, all communication with participants was conducted transparently, and the research procedures—including data collection, handling, and reporting—were disclosed clearly to promote trustworthiness, credibility, and ethical integrity throughout the study.

3.0 Results and Discussion

This section presents and discusses the study's results on teaching capacity and its influence on instructional delivery in Health Education, with the classroom physical environment considered a contextual factor. The analysis is structured to reflect the research objectives and integrates both descriptive and inferential statistical findings. The variables explored include (1) teaching capacity, assessed in terms of subject matter content knowledge, critical thinking skills, and disposition through problem-solving pedagogy; (2) instructional delivery effectiveness in Health Education; and (3) the conduciveness of the physical classroom environment. The results provide insights into the perceived strengths and areas for improvement in these domains, as evaluated by Health Education teachers and school heads.

3.1 Teaching Capacity

Subject matter content knowledge

The findings in Table 1 indicate that junior high school Health Education teachers possess a high level of subject matter content knowledge, with an overall mean of 4.47 ($SD = 0.31$) on a 5-point Likert scale. All indicators exceeded the benchmark value of 3.5, as shown by p -values less than .05 and a highly notable overall t -value of 31.71. The strongest area of agreement was on the importance of meeting adolescents' dietary needs ($M = 4.68$, $SD = 0.47$, $t = 25.79$). In contrast, the indicator on ideal weight and height, though still significant ($M = 4.27$, $t = 10.24$), showed relatively more variability. The enormous effect size (Cohen's $d = 3.11$) highlights a substantial difference from the expected standard, emphasizing that participants demonstrate a robust and well-established understanding of core health concepts.

Table 1. One-sample t -test results for Teaching Capacity: Subject matter content knowledge

Indicator	M	SD	t	p -value	Interpretation
1. The teacher discusses the importance of meeting the dietary needs of adolescents for rapid growth and development.	4.68	0.47	25.79	.000	Very High Extent
2. The teacher talks about the importance of developing healthy eating habits to prevent nutritional issues in adolescents.	4.53	0.64	16.45	.000	Very High Extent
3. The teacher expounds on the significance of improving the physical and mental performance of adolescents.	4.35	0.71	12.20	.000	High Extent
4. The teacher explains how to attain the ideal weight and height for the corresponding adolescents' age.	4.27	0.77	10.24	.000	High Extent
5. The teacher describes the common adolescents' nutritional concerns/illnesses and various ways to prevent them.	4.54	0.57	18.47	.000	Very High Extent
Overall General Assessment Effect Size (Cohen's d)	4.47	0.31	31.71	.000	High Extent 3.11 - Extremely Large Effect

Note: Interpretation is based on a 5-point Likert scale: 4.50–5.00 = Very High Extent (VHE); 3.50–4.49 = High Extent (HE). A test value of 3.5 was used as the neutral benchmark. Cohen's $d > 0.80$ is considered a large effect size. $n = 104$, $df = 103$

These results are consistent with previous research (Kamanzi & Seni, 2024; Leijen, 2022; Mafa-Theledi, 2024), which suggests that teaching capacity—particularly content knowledge—plays a critical role in delivering effective classroom instruction and promoting better learning outcomes in Health Education.

Critical thinking skills

Table 2 presents the one-sample t -test results assessing teaching capacity regarding critical thinking skills. The overall mean score of 4.23 ($SD = 0.42$) significantly exceeded the benchmark value of 3.5 ($p = .000$), indicating that participants perceived a high level of critical thinking integration in teaching practices. All five indicators scored between 4.12 and 4.40, with p -values less than .05, confirming statistical significance. The calculated Cohen's d of 1.75 suggests a considerable effect, underscoring the substantial difference from the hypothetical mean. Notably, the highest t -value (13.94) was recorded for the indicator on encouraging open-ended questioning. In contrast, the lowest t -value (8.23) was observed for promoting group-based perspective sharing, implying some variation in instructional emphasis.

The overall general assessment of teaching capacity in terms of critical thinking skills showed a strong t -value of 17.83 with a low standard deviation of 0.42, reflecting a high level of agreement and consistency among

participants that teachers effectively cultivate critical thinking abilities in students. These findings are in parallel with earlier studies, which indicated that teachers who possess and model essential skills of thinking foster intellectual curiosity, promote deeper student engagement, and create enriched learning environments (Pathak, 2024). Moreover, the application of critical thinking in instructional planning enhances the relevance of learning experiences (Ahmed & Ibrahim, 2023; Zhang, 2022) while also positively influencing student academic performance (Abubakar, 2024) and overall success (Pilande, 2023).

Table 2. One-sample *t*-test results for Teaching Capacity: Critical thinking skills

Indicator	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value	Interpretation
1. The teacher encourages students to ask open-ended health-related questions, challenge assumptions, and seek out answers.	4.40	0.66	13.94	.000	Very High Extent
2. The teacher provides students health-related problems or challenges to solve and encourage them to come up with multiple solutions.	4.23	0.74	10.07	.000	High Extent
3. The teacher motivates students to develop their own ideas and seek out and evaluate information from various sources.	4.12	0.69	9.14	.000	High Extent
4. The teacher familiarizes students with working in small groups to foster the sharing and discussion of diverse perspectives and ideas regarding health education topics.	4.15	0.81	8.23	.000	High Extent
5. The teacher asks students to back up their ideas and opinions with evidence and reasoning to allow for a better understanding of their ideas and those of others.	4.26	0.81	9.54	.000	High Extent
Overall General Assessment	4.23	0.42	17.83	.000	High Extent
Effect Size (Cohen's <i>d</i>)					1.75 - Large Effect

Note. Interpretation is based on a 5-point Likert scale: 4.50–5.00 = Very High Extent (VHE); 3.50–4.49 = High Extent (HE). A test value of 3.5 was used as the neutral benchmark. Cohen's *d* > 0.80 is considered a large effect size. *n* = 104, *df* = 103

Disposition through problem-solving pedagogy

The findings in Table 3 show that all five indicators of disposition through problem-solving pedagogy were rated at a “High Extent (HE)” and significantly exceeded the benchmark value of 3.5 ($p < .05$). Indicator 11, concerning prior knowledge recall, had the highest *t*-value ($t = 9.68$, $M = 4.26$, $SD = 0.80$), indicating strong agreement. Indicator 13, focused on encouraging alternative solutions, followed with a *t*-value of 7.09 ($M = 4.01$, $SD = 0.86$). Indicator 14, on sharing real-life experiences, showed the lowest *t*-value ($t = 3.08$, $M = 3.78$, $SD = 0.92$), and the highest variability, suggesting less consistent implementation. Indicator 15, about guiding students toward consensus and reflection, had a *t*-value of 5.03 ($M = 3.88$, $SD = 1.01$), indicating moderate agreement. Overall, the general assessment showed a mean of 4.00 ($SD = 0.49$), a *t*-value of 10.34 ($p = .00$), and a large effect size (Cohen's *d* = 1.01), suggesting a statistically and practically significant level of teaching capacity in promoting problem-solving pedagogy.

Table 3. One-sample *t*-test results for Teaching Capacity: Disposition through problem-solving pedagogy

Indicator	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value	Interpretation
1. The teacher helps students recall what previous health-related topic they have learned to prepare them for the problem of the day.	4.26	0.80	9.68	.000	Very High Extent
2. The teacher assists the students in understanding what the health problem is and in identifying the challenge behind the problem.	3.92	0.82	5.26	.000	High Extent
3. The teacher presents health-related situations and motivates students to give alternative solutions.	4.04	0.77	7.09	.000	High Extent
4. The teacher encourages students to share real-life experiences on health-related situations and discuss how they acted on it.	3.78	0.92	3.08	.000	High Extent
5. The teacher guides students to a consensus on the best health approach and asks them to write notes summarizing what they have learned.	4.00	1.01	5.03	.000	High Extent
Overall General Assessment	4.00	0.49	10.34	.000	High Extent
Effect Size (Cohen's <i>d</i>)					1.01 - Large Effect

Note. Interpretation is based on a 5-point Likert scale: 4.50–5.00 = Very High Extent (VHE); 3.50–4.49 = High Extent (HE). A test value of 3.5 was used as the neutral benchmark. Cohen's *d* > 0.80 is considered a large effect size. *n* = 104, *df* = 103

The study's results are findings by Singh (2023), who demonstrated that teachers who effectively select and implement pedagogical strategies aligned with students' learning needs contribute significantly to instructional quality and academic improvement. Ezeddine et al. (2022) supported these findings, showing that students exposed to problem-solving methods display higher levels of motivation and achievement than those taught using traditional strategies.

3.2 Effective Instructional Delivery in Health Education

Table 4 presents the results of a one-sample t-test to determine whether participants' assessments of instructional delivery effectiveness in Health Education significantly differed from the hypothetical test value of 3.5. The overall mean score was 4.31 ($SD = 0.45$), interpreted as "High Extent (HE)", indicating that participants perceived instructional delivery as highly effective. Mean scores for all five indicators ranged from high to very high, from 4.20 ($SD = 0.79$) for problem-based learning to 4.52 ($SD = 0.64$) for lesson pacing.

Table 4. One-sample t-test results for effective instructional delivery in Health Education

Indicator	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value	Interpretation
1. The teacher provides a clear and structured explanation of the Health Education lessons.	4.38	0.73	12.39	.000	High Extent
2. The teacher uses appropriate demonstrations, effective visual aids, and technology to deliver the Health Education lessons.	4.21	0.71	10.28	.000	High Extent
3. The teacher uses problem-based learning by presenting students with relevant real-world problems and exploring them under the lens of the current Health Education lesson.	4.20	0.79	9.03	.000	High Extent
4. The teacher consistently aligns their instructional activities with the learning objectives stated in the Health Education curriculum.	4.22	0.80	9.19	.000	High Extent
5. The teacher employs appropriate lesson pacing to ensure no student is left behind in Health Education class.	4.52	0.64	16.29	.000	Very High Extent
Overall General Assessment Effect Size (Cohen's <i>d</i>)	4.31	0.45	18.26	.000	High Extent 1.79 - Large Effect

Note. Interpretation is based on a 5-point Likert scale: 4.50–5.00 = Very High Extent (VHE); 3.50–4.49 = High Extent (HE). A test value of 3.5 was used as the neutral benchmark. Cohen's *d* > 0.80 is considered a large effect size. *n* = 104, *df* = 103

Statistical analysis revealed that the participants' assessments were significantly higher than the hypothetical population test value of 3.5, with all indicators yielding *p*-values < .001. The computed Cohen's *d* of 1.79 indicates a huge effect size (Cohen, 1988), suggesting that the effectiveness of instructional delivery is not only statistically significant but also practically meaningful in the context of Health Education.

Specifically, Indicator 1, "The teacher provides a clear and structured explanation of the Health Education lessons," received a *t*-value of 12.39 ($SD = 0.73$), reflecting strong agreement on clarity of instruction. Indicator 2, regarding the use of demonstrations, visual aids, and technology, had a *t*-value of 10.28, supporting the effective integration of teaching tools. Indicator 3, which focused on problem-based learning, had a lower *t*-value of 9.03, indicating significant but more varied responses. Indicator 4, on alignment with curriculum objectives, had a *t*-value of 9.19, suggesting consistency in linking activities with learning goals. Notably, Indicator 5, "The teacher employs appropriate lesson pacing," had the highest *t*-value (16.29) and the lowest standard deviation ($SD = 0.64$), demonstrating firm consensus on effective time management in instruction.

The overall assessment yielded a *t*-value of 18.26, further reinforcing the conclusion that Health Education teachers demonstrate high effectiveness in instructional delivery. The high extent of effective instructional delivery in Health Education implies that teachers are employing pedagogical strategies that actively engage students, clarify complex health concepts, and align instruction with learning objectives, according to a study conducted by Chen (2021), which highlighted that active, explicit, and engaging instruction creates dynamic learning environments conducive to meaningful understanding. Moreover, Miyauchi (2020) further stressed the importance of using diverse instructional tools, strategies, and support systems—along with comprehensive teacher training programs—to ensure that Health Education instruction meets students' cognitive and developmental needs. Furthermore, consistent use of structured explanations, visual aids, and well-paced lessons supports inclusive learning environments where all students can succeed (Canales, 2020).

Table 5 presents the results of the paired-samples *t*-test conducted to determine whether there was a significant difference in the perceived extent of effective instructional delivery in Health Education between school heads and teachers. Both groups reported a general rating of "High Extent (HE)", with weighted mean scores across all five indicators ranging from 4.13 (*SD* = 0.84) to 4.56 (*SD* = 0.57). Teachers rated Indicator 5 as appropriate lesson pacing, which was the highest (*M* = 4.48, *SD* = 0.70), showing strong agreement with school heads, who rated it at 4.56 (*SD* = 0.57). The lowest ratings from teachers were for Indicator 2 (use of technology and materials) and Indicator 4 (alignment of instructional activities with learning objectives), both at *M* = 4.19, slightly lower than the school heads' ratings (*M* = 4.23 and 4.25, respectively).

Table 5. Paired-samples *t*-test results for effective instructional delivery in Health Education

Indicator	School Heads <i>M</i>	Teachers <i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value	Decision
1. The teacher provides a clear and structured explanation of the Health Education lessons.	4.35	4.42	1.08	-0.51	.610	Not significant
2. The teacher uses appropriate demonstrations, effective visual aids, and technology to deliver the Health Education lessons.	4.23	4.19	0.88	0.31	.755	Not significant
3. The teacher uses problem-based learning by presenting students with relevant real-world problems and exploring them under the lens of the current Health Education lesson.	4.13	4.27	1.12	-0.87	.390	Not significant
4. The teacher consistently aligns their instructional activities with the learning objectives stated in the Health Education curriculum.	4.25	4.19	1.26	0.33	.742	Not significant
5. The teacher employs appropriate lesson pacing to ensure no student is left behind in Health Education class.	4.56	4.48	0.90	0.61	.542	Not significant
Overall General Assessment Effect Size (Cohen's <i>d</i>)	4.30	4.31	0.62	-0.09	.929	Not significant 0.01 - Small Effect

Note. Interpretation is based on a 5-point Likert scale: 4.50–5.00 = Very High Extent (VHE); 3.50–4.49 = High Extent (HE). Cohen's *d* > 0.80 is considered a large effect size. *n* = 52 *df* = 51

The overall mean ratings were 4.30 (*SD* = 0.43) for school heads and 4.31 (*SD* = 0.47) for teachers, reflecting near-identical perceptions of instructional delivery effectiveness. Standard deviations across indicators ranged from 0.88 to 1.26, indicating moderate response variability. The highest variability was seen in Indicator 4 (*SD* = 1.26), while the overall standard deviation remained relatively low (*SD* = 0.62), suggesting general agreement among participants. The *t*-test results showed no statistically significant mean differences (*t*-values = -0.87 to 0.31; *p* > .05), indicating no meaningful discrepancy between the groups' evaluations. Cohen's *d* was -0.01, indicating a negligible effect with limited practical relevance (Cohen, 1988). The negative value indicates a slight tendency for teachers to rate themselves higher than school heads, but the difference is not practically meaningful.

This alignment in perception is an encouraging indicator of coherence in the school system's instructional standards and evaluation practices. It implies that teachers and administrators operate under a common understanding of effective teaching behaviors in Health Education, which may support more unified professional development initiatives, informed supervision, and continuous instructional improvement (Flores & Day, 2021; Darling-Hammond et al., 2020). Furthermore, the consistency of responses reinforces the reliability of internal evaluations and suggests that school leaders and educators are collaboratively reinforcing quality teaching practices that support student learning outcomes (Miyachi, 2020).

3.3 Conduciveness of the Physical Classroom Environment

Table 6 presents the findings of the one-sample *t*-test conducted to determine whether participants' evaluations of the classroom physical environment's conduciveness significantly differed from the hypothetical test value of 3.5. Results indicate that participants rated the classroom environment at a "High Extent (HE)", with overall mean values consistently exceeding the test value across all five indicators. The general mean score was *M* = 4.24, *SD* = 0.49, interpreted as "High Extent," indicating favorable perceptions of the physical learning environment.

Table 6. One-sample *t*-test results for conducive classroom physical environment

Indicator	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value	Interpretation
1. The classroom is well-ventilated, well-lit, and always clean.	4.46	0.68	14.39	.000	High Extent
2. All the resources (technology, teaching materials) are available and accessible.	4.08	0.98	5.99	.000	High Extent
3. The seating arrangements are flexible and adaptable to support different class activities and performances.	4.34	0.65	13.17	.000	High Extent
4. The safety protocols (first aid, fire drills) are well-maintained and available.	4.48	0.62	16.06	.000	High Extent
5. The classroom has accessibility features for students with disabilities (e.g., assistive technology, ramps).	3.87	1.11	3.37	.000	Very High Extent
Overall General Assessment	4.24	0.49	15.62	.000	High Extent
Effect Size (Cohen's <i>d</i>)					1.53 - Large Effect

Note. Interpretation is based on a 5-point Likert scale: 4.50–5.00 = Very High Extent (VHE); 3.50–4.49 = High Extent (HE). Cohen's *d* > 0.80 is considered a large effect size. *n* = 104 *df* = 103

Each indicator received a mean above 3.5, ranging from *M* = 3.87, *SD* = 1.11 (accessibility features) to *M* = 4.48, *SD* = 0.62 (safety protocols). All *p*-values were below the .050 significance level, with most at *p* = .000, confirming that the participants' evaluations were significantly higher than the neutral benchmark. These findings suggest that the classroom environments were perceived as statistically more conducive to learning than the neutral baseline.

The computed Cohen's *d* of 1.53 signifies a huge effect size (Cohen, 1988), emphasizing the practical significance of a well-maintained and supportive physical environment in enhancing teaching and learning. The large magnitude of effect highlights the importance of structural and environmental elements—such as lighting, ventilation, cleanliness, safety, and space configuration—in fostering productive educational experiences.

Specifically, Indicator 1 (“The classroom is well-ventilated, well-lit, and always clean”) yielded a high *t*-value of 14.39, with a relatively low *SD* = 0.68, indicating strong consensus on basic physical comfort. Indicator 2 (availability of resources like teaching materials and technology) had a lower *t*-value of 5.99 and *SD* = 0.98, reflecting more variability—likely due to differences in material access across schools.

Indicator 3 (flexible seating arrangements) produced a *t*-value of 13.17 with *SD* = 0.65, suggesting high agreement regarding adaptive classroom layouts. Indicator 4 (safety protocols) recorded the highest *t*-value of 16.06 and a low *SD* = 0.62, pointing to widespread recognition of adequate safety measures. Conversely, Indicator 5 (accessibility features for students with disabilities) showed the lowest *t*-value of 3.37 and the highest variability (*SD* = 1.11), indicating inconsistent provision of inclusive infrastructure.

The overall *t*-value of 15.62 for general classroom conduciveness supports the conclusion that the physical learning environment is perceived as significantly and consistently supportive of student learning. However, the variability observed in accessibility and resource-related indicators points to areas where equity and infrastructure need improvement.

The high extent of perceived conduciveness in the classroom physical environment implies that schools are providing learning spaces that support effective instruction and student engagement. A well-ventilated, clean, and safely structured classroom enhances students' focus, comfort, and participation, essential for meaningful learning experiences (Llego, 2022). The findings affirm that physical conditions—such as proper lighting, organized layouts, safety protocols, and accessible learning resources—create an atmosphere that facilitates the delivery of Health Education content. Moreover, consistent positive perceptions from educators reflect the school system's responsiveness to maintaining quality facilities (Bautista, 2022). However, the variability noted in accessibility features suggests that inclusive infrastructure must be prioritized to ensure that all learners, regardless of physical ability, benefit from equitable learning environments (Manlangit et al., 2021).

3.4 Effect of Teaching Capacity Dimensions on Effective Instructional Delivery in Health Education

Table 7 presents the results of the different dimensions of teaching capacity—namely, subject matter content knowledge, critical thinking skills, and disposition through problem-solving pedagogy—collectively influence the effectiveness of instructional delivery in Health Education. The regression analysis revealed a positive but weak correlation between the combined components of teaching capacity and effective instructional delivery, with an

r -value of 0.29. This suggests that improvements in teaching capacity are associated with improvements in instructional delivery; however, the relationship is not strong. When considered together, the coefficient of determination ($R^2 = 0.09$) indicates that only 9% of the variance in effective instructional delivery can be explained by the three predictors—subject matter content knowledge, critical thinking skills, and disposition through problem-solving pedagogy.

This low R^2 value points to the complexity of instructional effectiveness, which is likely influenced by multiple factors beyond teaching capacity, such as student motivation, classroom environment, access to resources, family support, and institutional systems (Bernardo, 2021; David et al., 2022). Despite the limited explanatory power, the model was statistically significant, as indicated by the F -statistic of 3.11 and p -value of .030, supporting the idea that teaching capacity, as a combined construct, plays a meaningful role in shaping instructional outcomes.

Table 7. Multiple regression and ANOVA results on the extent of teaching capacity dimensions on effective instructional delivery in health education

Model	Standardized Coefficients (Beta)	t -value	p -value	r -value	R^2 -value	F -value (ANOVA)	p -value	Interpretation
Subject matter content knowledge	.10	0.94	.348					
and			Not significant					
Effective instructional delivery in Health Education			Failed to Reject H_0					
Critical thinking skills	.11	1.11	.271					
and			Not significant	.29	0.09	3.11	.030	Significant
Effective instructional delivery in Health Education			Failed to Reject H_0	Positive Weak Relationship				Reject H_0
Disposition through problem-solving pedagogy	.20	2.00	.048					
and			Significant					
Effective instructional delivery in Health Education			Reject H_0					

Note. ± 0.00 to ± 0.10 (very weak), ± 0.10 to ± 0.30 (Weak), ± 0.30 to ± 0.50 (Moderate), ± 0.50 to ± 0.70 (strong), ± 0.70 to ± 1.00 (Very Strong); $p < .05$.

Among the three predictors, only disposition through problem-solving pedagogy emerged as a statistically significant individual contributor, with $\beta = .20$, $t = 2.00$, and $p = .048$. This outcome points to the critical role of incorporating problem-solving and learner-centered methods in effective instruction. In contrast, subject matter content knowledge ($p = .348$) and critical thinking skills ($p = .271$) were not significant predictors when considered independently. This suggests that while foundational knowledge and cognitive skills are essential, they may not directly enhance instructional delivery unless integrated through affective and student-centered approaches (Garcia & Mendoza, 2020).

Overall, the results emphasize the importance of disposition through problem-solving pedagogy—particularly those grounded in active learning frameworks—in delivering effective Health Education instruction. These findings reinforce the need to go beyond content mastery in teacher development programs and focus on promoting instructional flexibility, student engagement, and contextualized pedagogy.

3.5 Effect of Conducive Classroom Physical Environment on Teaching Capacity Dimensions

Table 8 presents the regression analysis examining the extent to which the conduciveness of the classroom physical environment is associated with the three core dimensions of teaching capacity: subject matter content knowledge,

critical thinking skills, and disposition through problem-solving pedagogy. The overall model revealed a moderate positive correlation ($r = .32$) and a coefficient of determination ($R^2 = 0.10$), indicating that the physical classroom environment can explain 10% of the variance in teaching capacity. Although the effect size is modest, the F -value of 3.87 and p -value of .012 suggest that the model is statistically significant. This finding supports the notion that a conducive classroom environment contributes meaningfully to teachers' instructional competencies, though it is not the sole influencing factor.

Among the teaching capacity dimensions, the physical classroom environment significantly predicted subject matter content knowledge ($\beta = .22$, $t = 2.21$, $p = .030$), suggesting that better environmental conditions may enhance a teacher's ability to apply and deliver content knowledge effectively. In contrast, critical thinking skills ($\beta = .12$, $p = .240$) and disposition through problem-solving pedagogy ($\beta = .10$, $p = .297$) were not statistically significant. This implies that while the physical environment may create the foundational conditions for teaching, more complex instructional behaviors—such as promoting higher-order thinking and engaging students in active problem-solving—likely require additional supports, including ongoing professional development, pedagogical training, and curriculum refinement.

Table 8. Multiple regression and ANOVA results on the extent of conducive classroom physical environment on teaching capacity dimensions

Model	Standardized Coefficients (Beta)	t-value	p-value	r-value	R ² -value	F-value (ANOVA)	p-value	Interpretation
Conductive classroom physical environment	.22	2.21	.030					
and			Significant					
Subject matter content knowledge			Reject H ₀					
Conductive classroom physical environment	.12	1.18	.240					
and			Not significant	.32	0.10	3.87	.012	Significant
Critical thinking skills			Failed to Reject H ₀	Positive Weak Relationship				Reject H ₀
Conductive classroom physical environment	.10	1.05	.297					
and			Not significant					
Disposition through problem-solving pedagogy			Failed to Reject H ₀					

Legend. ± 0.00 to ± 0.10 (very weak), ± 0.10 to ± 0.30 (Weak), ± 0.30 to ± 0.50 (Moderate), ± 0.50 to ± 0.70 (strong), ± 0.70 to ± 1.00 (Very Strong); $p < .05$.

These results are consistent with research highlighting the physical environment as a facilitator of teacher performance and student learning, particularly when it supports focus, comfort, and classroom management (Bautista, 2022; David et al., 2022). Factors such as adequate lighting, ventilation, temperature control, ergonomic seating, and spatial layout can improve teachers' ability to plan and execute lessons effectively, thereby indirectly enhancing student engagement and achievement. However, the relatively low R^2 emphasizes the multifactorial nature of teaching capacity, suggesting that classroom environment, while important, is only one element in a broader system of instructional effectiveness.

These findings imply that while the classroom physical environment may not wholly determine teaching capacity, it remains a critical enabling factor that can support and enhance teachers' instructional effectiveness, particularly in applying subject matter content knowledge. Studies have consistently shown that well-designed, flexible classrooms support varied instructional strategies and enhance both teaching efficacy and academic achievement.

(Ahmed et al., 2020; Cox, 2024; Munna & Kalam, 2021; Quarcoo, 2021). However, the absence of significant effects on critical thinking skills and problem-solving pedagogy highlights that physical conditions alone are insufficient to cultivate higher-level teaching practices. This suggests that reforms to improve teaching performance should adopt a multi-dimensional strategy, combining environmental upgrades with targeted professional development, curriculum support, and institutional leadership. Investing in physical infrastructure should therefore be seen not in isolation, but as part of a holistic framework that recognizes the interplay between physical, pedagogical, and organizational conditions in shaping teacher capacity and student learning outcomes.

3.6 Effect of Conducive Classroom Physical Environment on Effective Instructional Delivery in Health Education

Table 9 summarizes the regression analysis examining the physical classroom environment's influence on effective instructional delivery in Health Education. The results revealed a moderate, positive, and statistically significant effect, with a standardized Beta coefficient of 0.35, indicating that improvements in the classroom setting – such as enhanced lighting, ventilation, cleanliness, and comfort – are associated with improved instructional practices. The analysis yielded a significant result, $t(103) = 3.75$, $p < .001$, indicating a non-random association between the variables.

Table 9. Regression and ANOVA results on the extent of the effect of conducive classroom physical environment on effective instructional delivery in Health Education

Model	Standardized Coefficients (Beta)	t-value	p-value	r-value	R ² -value	F-value (ANOVA)	p-value	Interpretation
Conducive classroom physical environment				.348 ^a				
and	.35	3.75	.000	Positive Moderate Relationship	0.12	14.093	.000	Highly Significant
Effective instructional delivery in Health Education								Reject H ₀

Legend. ± 0.00 to ± 0.10 (very weak), ± 0.10 to ± 0.30 (Weak), ± 0.30 to ± 0.50 (Moderate), ± 0.50 to ± 0.70 (strong), ± 0.70 to ± 1.00 (Very Strong); $p < .05$.

A correlation of $r = .35$ was found, reflecting a positive moderate association between classroom physical environment and instructional delivery. The corresponding coefficient of determination ($R^2 = .12$) indicates that the classroom environment explains 12% of the variance in instructional delivery. While this represents a modest proportion of the variance, it is considered meaningful in educational contexts where multiple complex and interacting factors influence instructional quality. The regression model reached statistical significance, $F(4, 99) = 14.09$, $p < .001$, suggesting that the predictors contribute meaningfully to the variance explained. These results suggest that improvements in the physical classroom environment positively affect how instruction is delivered in Health Education. Specifically, conducive classroom features enhance teacher focus, content clarity, and student engagement—factors especially crucial in promoting health literacy and active learning. The regression diagnostics also confirmed that key statistical assumptions were met, affirming the model's validity.

The findings underscore the critical role of the classroom physical environment in promoting instructional effectiveness, particularly in Health Education, where lesson clarity, engagement, and interaction are essential. A well-maintained and supportive classroom—characterized by proper lighting, ergonomic seating, air quality, and cleanliness—provides teachers with a setting conducive to delivering instruction confidently and effectively (David et al., 2022; Llego, 2022). Although the effect size is moderate, it reflects a real and practical influence that warrants attention in policy and school infrastructure planning. Investments in improving classroom conditions should be viewed not merely as aesthetic upgrades but as strategic interventions that can enhance pedagogical quality and student learning outcomes. These findings advocate for an integrated approach to educational reform that recognizes physical learning spaces as active contributors to instructional quality, especially in content areas that demand student-centered and health-informed teaching practices.

4.0 Conclusion

This study comprehensively examines teaching capacity in Health Education by integrating three core dimensions: subject matter content knowledge, critical thinking skills, and disposition through problem-solving pedagogy. It also examines how these dimensions relate to effective instructional delivery and how a conducive classroom physical environment supports both. The findings of this study yield several implications that can inform both classroom practice and future research in Health Education. In terms of practice, the strong effect of teaching capacity on instructional delivery underscores the importance of continuous teacher development. Schools should provide regular training, mentoring, and capacity-building programs focusing on content mastery, innovative pedagogy, and integration of technology in Health Education. Teachers who enhance these competencies are better able to deliver engaging and practical instruction.

The classroom's physical environment also emerged as a critical factor that shapes both teaching capacity and instructional delivery. This highlights the need for administrators to recognize the learning environment as an instructional resource. Adequate lighting, ventilation, seating, and instructional facilities contribute to smoother lesson flow and greater student participation. Thus, ensuring conducive learning spaces should be part of practical interventions to improve instructional quality. For classroom practice, it is equally important for teachers to act as reflective practitioners, connecting their capacity and the conditions of their classroom environment with their chosen teaching strategies. By evaluating their instructional delivery and adapting to contextual realities, teachers can maximize student learning in Health Education.

At the same time, these findings provide directions for future research. While this study established the significant effects of teaching capacity, future inquiries should explore which specific dimensions of capacity—such as pedagogical adaptability, technological proficiency, or subject mastery—most strongly predict effective instructional delivery. In addition, future research may examine the mediating or moderating role of the classroom environment in this relationship. For example, further studies could investigate whether an improved physical environment enhances the positive impact of teacher training or whether weak environments limit the benefits of strong teaching capacity.

Comparative and longitudinal studies may also provide deeper insights. Research across rural and urban schools, public and private institutions, or resource-rich and resource-limited classrooms can highlight contextual differences that affect instructional delivery in Health Education. Meanwhile, longitudinal or mixed-methods research can capture not only the measurable effects of teaching capacity and classroom environments over time but also the lived experiences and adaptive strategies of teachers navigating diverse instructional contexts. Together, these implications for practice and future research highlight the dynamic interplay between teacher capacity, classroom environments, and instructional delivery, offering concrete directions for both immediate improvements in teaching and long-term scholarly exploration.

5.0 Contribution of Authors

Author: conceptualization, data gathering, data analysis, data gathering, proposal writing, data gathering.

6.0 Funding

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7.0 Conflict of Interest

The author declares that there is no conflict of interest.

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