


Effect of Emerging Technology Integration on Instructional Practices in the Classroom Social Dynamics Among Senior High Schools in Sariaya District, Division of Quezon

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emerging technologies, technology integration, instructional practices, classroom social dynamics, student engagement, collaborative learning, assessment of learning, senior high school education

Abstract. This study examines the effects of integrating emerging technologies on instructional practices and classroom social dynamics in senior high schools in the Sariaya District, Division of Quezon. Using a quantitative cross-sectional survey design, data were collected from 143 teachers across eight senior high schools to determine the extent of technology integration in lesson planning, classroom management, instructional materials development, instructional delivery, and assessment of learning. Findings reveal that teachers demonstrate moderate to high levels of technology integration, primarily utilizing digital tools to support multimedia instruction and enhance student engagement. The results also indicate that student-to-student and teacher-to-student interactions are generally strong, suggesting that technology can effectively support collaborative and interactive learning environments. Furthermore, technology-based assessments and digitally supported instructional delivery significantly improve peer collaboration, participation, and communication among learners, making classroom interactions more dynamic and inclusive. However, the study also highlights those advanced technologies, such as artificial intelligence-based assessments and learning management systems, are not widely utilized due to challenges including limited technological resources, inadequate infrastructure, and insufficient teacher training. These barriers hinder the full potential of technology integration in classroom settings. Despite these constraints, teachers demonstrate initiative by engaging in professional development opportunities and collaborating with colleagues to improve their technology integration practices. The study concludes that the effective and strategic integration of emerging technologies can positively influence classroom social dynamics when supported by adequate training, resources, and institutional support. Therefore, continuous digital skills training and improved access to technological tools are strongly recommended to maximize the benefits of technology-enhanced learning environments for both teachers and learners.

Introduction

The rapid evolution of emerging technologies, such as artificial intelligence (AI), virtual reality (VR), and online collaborative platforms, has become a significant driver of change in educational settings worldwide. These technologies are transforming teaching and learning processes by enhancing student engagement and improving instructional effectiveness. Current research highlights their role in enabling personalized and interactive learning experiences (Zhang et al., 2021). Moreover, Hwang et al. (2019) argue that these innovations reshape classroom social dynamics by encouraging student participation and redefining teacher-student interactions. Despite these

recognized benefits, a significant gap remains in understanding the specific effects of technology integration on classroom social dynamics, particularly in regional contexts such as the Philippines.

The integration of emerging technologies has the potential to significantly influence instructional practices and reshape classroom interactions. This study examines technology integration across key domains: lesson planning, classroom management, instructional materials development, instructional delivery, and assessment of learning. These domains represent essential teaching practices influenced by technological advancements. Lesson planning involves using digital tools to organize and adapt instruction; classroom management includes applications for monitoring engagement; instructional materials development focuses on creating multimedia resources; instructional delivery emphasizes interactive and online platforms; and assessment of learning incorporates digital and AI-supported evaluation tools. Studies by Kirkwood and Price (2019), Heikkilä et al. (2021), and Wang et al. (2020) confirm that integrating technology across these areas enhances instructional efficiency, engagement, and adaptability. However, meaningful integration requires alignment with instructional quality and continuous teacher development (Schmid et al., 2021).

Technology integration also plays a crucial role in improving classroom management and instructional delivery. Digital tools enable more efficient monitoring of student behavior, facilitate communication, and promote collaborative learning environments (Hwang & Wu, 2020; Al-Busaidi et al., 2021). In instructional materials development, multimedia and digital platforms allow teachers to create engaging and diverse learning resources tailored to students' needs (Lehtinen, 2019; Kimmons & Veletsianos, 2020). Similarly, technology-enhanced instructional delivery shifts learning toward interactive and student-centered approaches, fostering collaboration and active participation (Dillenbourg & Järvelä, 2020; Anderson et al., 2021). In assessment, digital tools provide immediate feedback and support collaborative evaluation practices, although the adoption of advanced AI-based systems remains limited due to technical and training constraints (Bennett, 2020; Howard et al., 2021).

The impact of technology integration on classroom social dynamics is most evident in student-to-student and teacher-to-student interactions. Technology-enhanced environments promote collaboration, communication, and a stronger sense of social presence, which contribute to improved engagement and academic performance (Garrison et al., 2019; Wang et al., 2021). However, challenges such as unequal access to technology and the digital divide may limit these benefits, particularly in under-resourced contexts (OECD, 2021). Teacher-to-student interaction is also enhanced through digital tools that support timely feedback, responsiveness, and learner engagement (Hattie & Timperley, 2020; Novo et al., 2020). These interactions play a vital role in fostering motivation, well-being, and academic success.

Despite national efforts to promote technology integration, limited research has examined its localized effects on classroom dynamics. The Sariaya District provides a valuable context for exploring how teachers integrate emerging technologies and how these influence social interactions in diverse educational settings. Addressing this gap is essential for developing context-responsive strategies that enhance teaching practices and learning outcomes.

This study aims to examine the relationship between the integration of emerging technologies and classroom social dynamics among senior high school teachers in the Sariaya District, Division of Quezon. It focuses on how technology influences peer relationships, student engagement, and teacher-student interactions. By exploring these dimensions, the study seeks to provide insights into how to improve pedagogical practices and foster inclusive, interactive, and socially enriching learning environments in a technology-driven educational landscape.

Statement of the Problem

This study aims to determine the effects of emerging technology integration on instructional practices in the classroom social dynamics among the senior high schools in Sariaya District, Division of Quezon. Specifically, it sought to answer the following questions:

1. How emerging technology integration on instructional practices can be described in terms of the following domains:
 - 1.1 Lesson Planning
 - 1.2 Classroom Management
 - 1.3 Instructional Materials Development
 - 1.4 Instructional Delivery
 - 1.5 Assessment of Learning?
2. What is the level of social dynamics in the classroom in terms of the following components:
 - 2.1 Student – to Student Interaction
 - 2.2 Teacher – to – Student Interaction?

3. Does emerging technology integration on instructional practices affects classroom social dynamics?
4. What are the challenges experienced by teachers in integrating emerging technology on instructional practices?
5. What are the actions implemented by the teachers to address the challenges encountered?
6. What faculty development intervention program can be proposed based on the findings of the study?

Methodology

Research Design

This study used a quantitative cross-sectional survey design to examine how the integration of emerging technologies affects classroom social dynamics. The respondents were teachers from senior high schools in the Sariaya District, Division of Quezon, with an estimated total population of 271 teachers. These schools have begun integrating technologies such as artificial intelligence and online collaborative tools into their teaching practices.

Data were collected using a structured survey questionnaire composed of closed-ended and Likert-scale items. The questionnaire measured teachers' level of technology integration in their instructional practices and their observations of student social interactions in the classroom. The survey was distributed electronically to ensure accessibility and encourage wider participation.

For data analysis, statistical tools such as SPSS or R were used. Descriptive and inferential statistics, including analysis of variance (ANOVA) and regression analysis, were applied to examine the relationship between technology integration and classroom social dynamics. These analyses also helped determine whether differences exist in teachers' perceptions based on their level of technological proficiency and the types of technologies used.

Respondents/Participation

The study's target population consisted of teachers within the Sariaya District Senior High School in Sariaya, Quezon. This population includes teachers from senior high schools in the district who provide direct instruction and interact with students. The population aims to capture a broad representation of educators who utilize or have the potential to utilize emerging technologies in their teaching practices, thereby facilitating a comprehensive understanding of how these technologies influence classroom dynamics. The researcher used stratified random sampling to ensure that diverse perspectives are captured, particularly from schools with varying levels of technological integration. The researcher selected respondents from eight senior high schools within Sariaya District using the Raosoft Online Calculator at 95% confidence, resulting in a total of 271 teachers in Sariaya District, of whom 143 were selected. The table below shows the breakdown of respondents in Sariaya District, Division of Quezon.

Instrument of the Study

This study employs a self-made questionnaire by the researcher as a primary data collection tool. A questionnaire were developed to assess the level of technology integration, teaching practices, and classroom social dynamics.

Procedure

The researcher crafted the questionnaire based on the specific problems identified in Chapter 1. The data-gathering procedure for this study will begin with an expert validation of the self-developed questionnaire to ensure its reliability and effectiveness. The expert will thoroughly examine the instrument, assessing its clarity, relevance, and appropriateness for the target respondents. Any necessary revisions or improvements will be made based on the expert's feedback. Following this validation, the instrument will undergo pilot testing at Lopez National Comprehensive High School. A small group of respondents will be selected to answer the research instrument under controlled conditions to identify any inconsistencies or difficulties in understanding the questions. The responses will be analyzed to determine the instrument's reliability and validity, ensuring it accurately measures the intended variables. Based on the pilot test results, further refinements may be made before full-scale data collection. This systematic approach will enhance the credibility and accuracy of the research findings.

Data Analysis

The data collected in this study were analyzed using both descriptive and inferential statistical methods to effectively address the research problems. For Statement of the Problem 1, mean scores were computed to determine the level of emerging technology integration in lesson planning, classroom management, instructional materials development, instructional delivery, and assessment of learning, using a five-point Likert scale with corresponding verbal interpretations.

Similarly, Statement of the Problem 2 assessed classroom social dynamics, particularly student-to-student and teacher-to-student interactions, also using mean scores and descriptive interpretations. For hypothesis testing, descriptive statistics, such as the mean and standard deviation, were used to summarize teachers' perceptions, while inferential statistics were used to examine relationships between variables. Specifically, Pearson's Correlation Coefficient (r) was used to assess the strength and direction of the relationship between technology integration and classroom social dynamics, and linear regression ($Y = a + bX$) was employed to determine whether technology integration significantly predicts changes in social interactions. Additionally, Statements of the Problem 4 and 5 used Likert-scale measures to assess the frequency of challenges teachers encountered and the extent of actions taken to address them. Overall, these statistical tools provided a comprehensive analysis of the data, enabling the researcher to identify patterns, relationships, and areas for improvement in technology integration and classroom social dynamics.

Ethical Consideration

The researchers secured permission from the Quezon School Division Superintendent, the District Supervisor, and the principals/school heads to conduct the study before administering the questionnaire. Upon approval of the requests, the distribution of the research questionnaire commenced. Before participation, respondents were informed of the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time without consequence. All data collected were kept confidential and used solely for research purposes. The data were anonymized and securely stored to protect the participants' identities. The completed questionnaires were collected by the researcher, and the data gathered from the respondents were tallied, statistically treated, analyzed, and interpreted. This data-gathering procedure outlined a systematic approach to collecting and analyzing quantitative data for the research study on the effects of integrating emerging technology on instructional practices and classroom social dynamics. By ensuring a thorough and ethical process, the study aimed to yield valid and reliable insights that informed educational practices in Sariaya District and similar contexts.

Results and Discussion

Part 1. Emerging Technology Integration

Lesson Planning	Mean	Verbal Interpretation
1. I utilize online lesson planning tools like Lesson Planner.ph to create and organize my lesson plans.	4.46	Moderately Integrated
2. I use technology to personalize my lesson plans based on student needs and learning styles.	4.41	Moderately Integrated
3. I incorporate technology-based assessments like online quizzes and interactive exercises into my lesson plans to monitor student progress and provide feedback.	3.85	Moderately Integrated
4. I utilize digital resources like videos, simulations, and interactive websites to enhance my lesson plans and provide engaging content for students.	4.39	Moderately Integrated
5. I use online platforms or applications to align lessons with curriculum standards.	4.17	Moderately Integrated
6. I utilize cloud storage or online folders (Google Drive, microsoft outlook) to manage and store my lesson plans.	4.13	Moderately Integrated
7. I utilize emerging technologies to differentiate lesson plans based on student needs and learning styles.	4.25	Moderately Integrated
8. I incorporate artificial intelligence (AI) tools and adaptive learning platforms in my lesson planning process.	4.13	Moderately Integrated
9. I search online for ideas and materials when planning my lessons	4.85	Highly Integrated
10. I use a computer or mobile device to write or organize my lesson plans.	4.70	Highly Integrated
Grand Mean:	4.33	Moderately Integrated

Table 1. Mean Ratings on the Description of the Emerging Technology Integration on Instructional Practices in terms of Lesson Planning

Technology integration in lesson planning is gaining traction among educators. As shown in the table, the computed grand mean of 4.33 indicates a moderately integrated level of technology integration in lesson planning. This result reflects that teachers are generally incorporating digital tools, but not yet to a highly integrated extent. The highest-rated item, "I search online for ideas and materials when planning my lessons" (4.85), which demonstrates that teachers frequently utilize online resources. This practice supports the findings of Zhao et al. (2021), who observed that educators rely on digital resources and multimedia materials to enrich lesson content and differentiate instruction. It also aligns with Alansari and Alsharif (2021), who emphasized that digital platforms facilitate collaboration and resource sharing among teachers. However, the

relatively lower mean score for “I incorporate technology-based tools in my lesson planning” (3.85) suggests that technology may not yet be intentionally embedded in lesson planning. This finding aligns with the concerns raised by Kirkwood and Price (2019), who argue that technology must be meaningfully integrated during the design phase rather than added superficially during instruction. The moderate level may also be attributed to common barriers identified in the literature, such as limited access to resources, insufficient professional development, and lack of confidence in using advanced digital tools (Heikkilä et al., 2021; Xu et al., 2021). Effective lesson planning serves as the foundation of quality instruction, ensuring alignment among learning objectives, strategies, materials, and assessments. As highlighted in related literature, when emerging technologies are intentionally integrated at the planning stage, such as through AI-assisted design (Chen et al., 2022) or blended learning frameworks (Graham, 2020), instruction becomes more personalized, flexible, and engaging.

Therefore, the moderate integration observed in this study indicates progress but also emphasizes that teachers require continuous professional development and institutional support to achieve higher levels of meaningful technology integration in lesson planning.

Classroom Management	Mean	Verbal Interpretation
1. I encourage students to collaborate on projects and assignments using digital tools (e.g., Google Docs, Google Classroom, Microsoft Outlook) to foster teamwork and communication.	4.21	Moderately Integrated
2. I utilize digital resources to organize classroom materials and create a more efficient learning environment.	4.29	Moderately Integrated
3. I use technology to create a more interactive and stimulating classroom environment, promoting active learning and student participation.	4.48	Moderately Integrated
4. I use technology to create and share classroom routines and procedures with students (e.g., digital checklists, interactive presentations).	4.17	Moderately Integrated
5. I use technology such as chat, Telegram, and Skype to communicate with parents and guardians about their child's progress and needs in the classroom.	4.45	Moderately Integrated
6. I use digital tools (e.g., online calendars, scheduling apps) to manage the classroom schedule and assignments.	4.11	Moderately Integrated
7. I use technology (e.g., online forums, Zoom, Meet, Microsoft Teams) to create a space for students to communicate with each other about classroom issues or concerns.	4.03	Moderately Integrated
8. I set clear technology-use expectations and routines in class.	4.25	Moderately Integrated
9. I track student participation and engagement through digital tools (Google Classroom, Edmodo, Flip, Kahoot).	3.83	Moderately Integrated
10. I use classroom management apps (ClassDojo, Teacher Kit).	3.61	Moderately Integrated
Grand Mean:	4.14	Moderately Integrated

Table 2. Mean Ratings on the Description of the Emerging Technology Integration on Instructional Practices in terms of Classroom Management

Table 2 shows that teachers demonstrate a moderate level of technology integration in classroom management, as reflected by the grand mean of 4.14, which is verbally interpreted as "moderately integrated." This means that teachers often use technology to support classroom organization, communication, and student engagement, but the level of integration is not yet very high. This result aligns with Al-Busaidi et al. (2021), who observed that many educators use digital tools primarily for communication and organization rather than for advanced analytics or AI-driven monitoring systems. The highest mean rating, “I use technology to create a more interactive and stimulating classroom environment, promoting active learning and student participation” (4.48), suggests that teachers prioritize engagement-focused technologies. This finding is consistent with Hwang and Wu (2020) and Smith (2023), who emphasized that interactive digital tools and gamified elements enhance participation and motivation. It also supports Thompson’s (2021) assertion that immersive and technology-enhanced environments capture students’ attention and foster a focused learning environment. However, the lower mean rating for “I use classroom management apps (e.g., ClassDojo, Teacher Kit)” (3.61) indicates limited use of specialized management applications for tracking student behavior and participation. This finding reflects the concerns raised by Carter and Duran (2020) and Liu et al. (2022), who stressed that advanced monitoring and AI-supported tools can significantly enhance classroom organization and individualized support when fully utilized. The moderate rating may suggest barriers such as limited training, insufficient familiarity with management apps, or concerns regarding data privacy and digital citizenship, as highlighted by Lee (2020). Overall, the results indicate that technology integration in classroom management is moderate, with greater emphasis on communication and engagement rather than on advanced monitoring and management practices.

Materials Development	Mean	Verbal Interpretation
1. I use digital tools and software (e.g., Canva, Adobe, and AI-generated content) to create instructional materials.	4.52	Highly Integrated
2. I integrate emerging technologies (e.g., augmented reality, AI, robotics) to enhance instructional materials.	4.07	Moderately Integrated
3. I utilize interactive learning platforms (LMS like Google Classroom, Moodle, Edmodo) to distribute instructional materials to students.	3.90	Moderately Integrated
4. I incorporate multimedia elements (e.g., videos, simulations, infographics) into my instructional materials to enhance student engagement.	4.27	Moderately Integrated
5. I regularly update and improve instructional materials based on feedback and new technological advancements.	4.13	Moderately Integrated
6. I use artificial intelligence (AI) tools like ChatGPT, CiCi, Quilbot, and Grammarly to assist in developing instructional content.	4.49	Moderately Integrated
7. I use technology to create my teaching materials (e.g., slides, worksheets).	4.74	Highly Integrated
8. I make interactive materials using apps or online tools.	4.59	Highly Integrated
9. I use photos, videos, or audio to make lessons more engaging.	4.87	Highly Integrated
10. I design posters, charts, or other visuals using editing tools or design software.	4.55	Highly Integrated
Grand Mean:	4.41	Moderately Integrated

Table 3. Mean Ratings on the Description of the Emerging Technology Integration on Instructional Practices in terms of Instructional Materials Development

Table 3 shows that teachers demonstrate a moderate level of technology integration in materials development, with a grand mean of 4.41, verbally interpreted as "Moderately Integrated." While instructional material creation generally incorporates technology, the degree of integration varies across specific practices. This finding supports recent research suggesting that teachers increasingly use digital tools for creating instructional resources, and integration levels often remain moderate rather than fully transformative. The highest-rated indicator was the use of photos, videos, and audio to make lessons more engaging (4.87), interpreted as highly integrated. This finding indicates that teachers are highly confident in using multimedia resources to enhance student engagement. Digital tools allow educators to integrate multimedia elements tailored to diverse learning preferences (Lehtinen, 2019). Similarly, Kimmons and Veletsianos (2020) highlighted that multimedia-rich and interactive digital materials deepen student engagement and participation. In contrast, the lowest-rated indicator was the use of learning management systems (LMS) to distribute instructional materials (3.90), interpreted as moderately integrated. This suggests that while teachers are adept at creating digital content, the structured use of online platforms to organize and manage instructional materials remains underdeveloped. This finding relates to studies emphasizing the importance of structured digital environments. Wang et al. (2020) highlighted that digital platforms support the efficient development and distribution of customized instructional materials, promoting sound instructional design practices. Similarly, Zheng and Warschauer (2022) emphasized that organized online platforms enrich instructional delivery by streamlining access and collaboration.

The results indicate that teachers are strongest in utilizing multimedia tools for instructional engagement, whereas system-level integration through learning management platforms presents opportunities for further enhancement.

Instructional Delivery	Mean	Verbal Interpretation
1. I use digital presentation tools like PowerPoint, Google Slides, and Prezi to enhance my instructional delivery.	4.78	Highly Integrated
2. I use video-based instructional tools like YouTube, Khan Academy, and Edpuzzle to supplement lesson delivery.	4.40	Moderately Integrated
3. I use educational apps and gamification tools like Kahoot, Quizizz, and Nearpod to engage students in learning.	4.01	Moderately Integrated
4. I conduct synchronous (live) and asynchronous (self-paced) instruction using digital platforms such as Zoom, Microsoft Teams, or Google Meet.	3.87	Moderately Integrated
5. I use technology to provide immediate feedback to students during lessons (e.g., online quizzes, polls, real-time response systems)	4.24	Moderately Integrated
6. I use technology to differentiate instruction and provide support to students with diverse learning needs through assistive technology.	4.22	Moderately Integrated

7. I use technology to make my lessons more accessible to all students, regardless of their learning styles or disabilities.	4.34	Moderately Integrated
8. I use technology to create opportunities for students to practice and apply their learning in a variety of ways, such as online games and simulations.	4.15	Moderately Integrated
9. I let students use technology to share or present their work.	4.55	Highly Integrated
10. I use video lessons or virtual meetings when needed.	4.08	Moderately Integrated
Grand Mean:	4.26	Moderately Integrated

Table 4. Mean Ratings on the Description of the Emerging Technology Integration on Instructional Practices in terms of Instructional Delivery

Table 4 shows that teachers demonstrate a moderate level of technology integration in instructional delivery, with a grand mean of 4.26, verbally interpreted as "moderately integrated." The table indicates that teachers exhibit a moderate level of technological integration in their educational delivery. This suggests that, although the degree of integration varies among instructional techniques, teachers typically use digital resources when delivering lessons.

According to research, teachers' pedagogical preparedness and comfort level with digital platforms are critical for successful instructional technology integration (Scherer et al., 2021). The use of digital presentation tools such as Google Slides, PowerPoint, and Prezi received the highest rating of 4.78, indicating a highly integrated level. This suggests that educators are very comfortable utilizing presentation tools to improve the organization and clarity of their lessons. Research indicates that when properly planned and organized, digital presentations can increase student engagement and recall of the material. Studies indicate that structured digital presentations can improve lesson engagement and knowledge retention when effectively designed (Bond et al., 2021). The indicator with the lowest rating, interpreted as "Moderately Integrated," was performing synchronous and asynchronous instruction using platforms such as Zoom, Microsoft Teams, or Google Meet (3.87). This means that although educators are comfortable using simple digital tools, the adoption of online teaching modalities is still in its early stages. Similar results indicate that obstacles, including inadequate infrastructure, insufficient training, and insufficient digital preparedness, affect the implementation of online instruction (Howard et al., 2021). In general, the findings suggest that while advanced digital instructional modalities, including organized online teaching platforms, need further development and support, teachers are most proficient in using presentation-based technology for classroom instruction.

Assessment of Learning	Mean	Verbal Interpretation
1. I use online assessment tools like Google Forms, Microsoft Forms, Kahoot, and Quizizz to evaluate student learning.	3.97	Moderately Integrated
2. I implement automated grading systems through Learning Management Systems (LMS), AI, and automated class records for assessments.	4.20	Moderately Integrated
3. I use game-based assessment tools, such as quizzes and Kahoot, to measure student progress.	3.94	Moderately Integrated
4. I utilize AI-powered assessment tools that provide insights into student performance and learning gaps.	3.85	Moderately Integrated
5. I use digital rubrics and scoring guides to assess students' performance in projects and written work.	4.10	Moderately Integrated
6. I conduct performance-based assessments using digital tools like video submissions, digital portfolios, and blogs.	4.17	Moderately Integrated
7. I use technology to provide immediate feedback to students on their assessments (e.g., online grading platforms, automated feedback tools).	4.09	Moderately Integrated
8. I use apps like Google Forms or Microsoft Forms for formative assessments.	4.32	Moderately Integrated
9. I track student progress and performance using educational software.	3.96	Moderately Integrated
10. I let students use digital tools to reflect on their learning or give peer feedback.	3.99	Moderately Integrated
Grand Mean:	4.06	Moderately Integrated

Table 5. Mean Ratings on the Description of the Emerging Technology Integration on Instructional Practices in terms of Assessment of Learning

Table 5 presents emerging technology integration in terms of learning assessment. It revealed that across all indicators, it is moderately integrated, with a grand mean of 4.06. It only shows that teachers use technology in learning assessments to a moderate extent. This suggests that, though the extent and frequency of integration vary across assessment approaches, teachers typically use digital resources to assess students' learning. Research highlights that instructors' knowledge of digital tools and the availability of enabling infrastructure are essential for the successful use of technology in assessments (Scherer et al., 2021). The highest-rated indicator was the use of apps such as Google Forms or Microsoft Forms for formative assessments (4.32), which was interpreted as moderately integrated. This implies that teachers are relatively confident in employing online tools to monitor student progress and provide formative feedback. Studies emphasize that such tools enhance real-time evaluation and enable teachers to quickly identify learning gaps (Bond et al., 2021). In contrast, the lowest-rated indicator was the use of AI-powered assessment tools that provide insights into student performance and learning gaps (3.85), interpreted as moderately integrated. This suggests that more advanced assessment technologies, such as AI-driven analytics, are less frequently utilized, possibly due to limited access, training, or familiarity. Similar research points out that the adoption of AI-based assessment tools in education is often constrained by technical readiness and teacher training (Howard et al., 2021).

Generally, the findings reveal that teachers are most confident in using digital tools for formative assessments, while advanced, AI-supported assessment methods remain underutilized.

Part 2. Level of Social Dynamics

Student-to-Student Interaction	Mean	Verbal Interpretation
1. Students actively collaborate and work together during group tasks and activities	4.64	Very High Social Dynamics
2. Students are comfortable expressing their ideas and opinions to their peers.	4.57	Very High Social Dynamics
3. Peer discussions and debates enhance students' critical thinking and problem-solving skills.	4.48	High Social Dynamics
4. Students communicate effectively with one another during class tasks.	4.52	Very High Social Dynamics
5. Students are willing to help each other with academic tasks and assignments.	4.34	High Social Dynamics
6. Students work collaboratively on projects or assignments, sharing responsibilities and supporting each other.	4.32	High Social Dynamics
7. Students help each other with their learning, explaining concepts or helping.	4.42	High Social Dynamics
8. Students engage in positive social interactions outside of academic tasks, such as conversations or shared activities.	4.42	High Social Dynamics
9. Students interact positively and respectfully during classroom work.	4.20	High Social Dynamics
10. Students resolve minor conflicts constructively among themselves.	4.01	High Social Dynamics
Grand Mean:	4.39	High Social Dynamics

Table 6. Mean Ratings on the Level of Social Dynamics in terms of Student-to-Student Interaction

Table 6 shows a moderate-to-high level of social dynamics in student-to-student interaction, with a grand mean of 4.39. The distinguished-rated item, "Students actively collaborate and work together during group tasks and activities" (4.64), suggests that students are engaged in collaborative learning. This aligns with recent studies that affirm that collaborative learning environments significantly enhance student engagement, critical thinking, and shared liability. A meta-analysis by Kyndt et al. (2019) and more recent findings by Gillies (2021) support the view that structured group work improves academic performance and interpersonal skills when properly facilitated. The strong ratings for "Students are comfortable expressing their ideas and opinions to their peers" (4.57) and "Students communicate effectively with one another during class tasks" (4.52) indicates a positive classroom environment. According to Mercer and Dörnyei (2020), supportive peer interaction enhances learner confidence and classroom participation. Additionally, research by the OECD (2021) on global competence underscores that communication and collaboration skills are essential components of 21st-century learning and are strengthened through interactive classroom environments. However, the moderate ratings on items such as "Students resolve minor conflicts among themselves constructively" (4.01) indicate areas for improvement. As noted by Malti et al. (2022), integrating social-emotional learning (SEL) strategies significantly improves students' ability to manage peer conflicts constructively.

Some studies support the importance of social dynamics in learning. For example, Zepke and Leach (2020) found that when students felt a strong sense of belonging, their engagement and participation increased, reflecting the importance of social dynamics in students' success. However, Wang et al. (2021) analyzed the impact of digital tools on peer feedback tracking. It indicated that technology not only facilitates more frequent feedback exchanges but also improves the quality of peer interactions, thereby increasing academic achievement.

Teacher-to-Student Interaction	Mean	Verbal Interpretation
1. I establish clear and open communication with my students to ensure effective learning.	4.52	Very High Social Dynamics
2. I actively listen to students' opinions and feedback during discussions and classroom interactions.	4.48	High Social Dynamics
3. I try to engage all students in class discussions and activities.	4.48	High Social Dynamics
4. I provide individualized support to students who need extra help in their learning.	4.32	High Social Dynamics
5. I encourage and motivate students by recognizing their efforts and achievements.	4.44	High Social Dynamics
6. I use positive reinforcement techniques to create a supportive classroom environment.	4.55	Very High Social Dynamics
7. I help students develop confidence in their abilities by providing constructive feedback.	4.55	Very High Social Dynamics
8. I show interest in my students' learning and personal development.	4.64	Very High Social Dynamics
9. I provide personalized feedback on students' work, helping them recognize their strengths and areas for improvement.	4.54	Very High Social Dynamics
10. I adjust my communication style based on student needs.	4.66	Very High Social Dynamics
Grand Mean:	4.52	Very High Social Dynamics

Table 7. Mean Ratings on the Level of Social Dynamics in terms of Teacher-to-Student Interaction

With a grand mean of 4.52 (verbalized as Very High Social Dynamics), the table presents the mean evaluations of the degree of social dynamics in teacher-to-student interactions. This indicates that teachers are active and have positive interactions with pupils, reflecting a classroom that is encouraging and adaptable. Strong teacher-student interactions have a major impact on students' motivation, engagement, and academic success, according to a recent OECD study (2021). "I adapt my communication style based on student needs" (4.66), which was interpreted as highly integrated and was the indicator with the highest rating. It also demonstrates that teachers use adaptable communication techniques and are highly sensitive to their students' distinct needs. Based on recent research, students' sense of belonging and inclusivity are strengthened by differentiated communication and responsiveness (Darling-Hammond et al., 2020). Additionally, better classroom environments and increased student engagement are associated with adaptive teaching methods (Scherer et al., 2021). However, the statement "I provide individualized support to students who need extra help in their learning" (4.32), which was classified as High Social Dynamics, had the lowest rating of any indicator. This indicates that although the 'proceed' instruction might not be used as frequently as other engagement strategies, it is still highly rated. According to recent research, teachers prefer personalized training, but the extent of that support may be limited by time constraints and workload demands (Tondeur et al., 2021). In general, the findings indicate that social dynamics in the classroom are strongly influenced by teacher-student interactions, particularly through adaptive communication and positive reinforcement. Enhancing organized, personalized resources, however, might further improve learning outcomes and teacher-student interaction.

Part 3. Effects of Emerging Technology Integration on Instructional Practices in the Classroom Social Dynamics

Independent Variables	Regression Coefficient	p-value	Decision	Remarks
Constant	2.332	0.000	Reject Ho	Significant
Lesson Planning	-0.062	0.715	Failed to Reject Ho	Not Significant
Classroom Management	-0.466	0.020	Reject Ho	Significant
Materials Development	-0.148	0.421	Failed to Reject Ho	Not Significant
Instructional Delivery	0.308	0.034	Reject Ho	Significant
Assessment of Learning	0.887	0.000	Reject Ho	Significant

Table 8. Linear Regression: Significant Factors Predicting the Classroom Social Dynamics in terms of Student-to-Student Interaction

The linear regression analysis discloses that Classroom Management, instructional delivery, and assessment of learning are substantial predictors of classroom social dynamics in student-to-student interactions. Specifically, the results show that Assessment of Learning is the strongest predictor ($\beta = 0.887$, $p = 0.000$), suggesting that assessments promoting collaboration increase interaction, aligning with Tai et al. (2023). Instructional delivery also positively predicts interaction ($\beta = 0.308$, $p = 0.034$), supporting the idea that student-centered instructional delivery promotes communication and cooperative problem-solving (Darling-Hammond et al., 2021). Interestingly, Classroom Management shows a negative coefficient ($\beta = -0.466$, $p = 0.020$), suggesting better management is associated with lower student-to-student interaction, counter to Marzano's (2003) view that effective management fosters positive interactions. Lesson planning and materials development are not significant predictors here.

Independent Variables	Regression Coefficient	p-value	Decision	Remarks
Constant	3.917	0.000	Reject Ho	Significant
Lesson Planning	0.217	0.189	Failed to Reject Ho	Not Significant
Classroom Management	0.192	0.318	Failed to Reject Ho	Not Significant
Materials Development	-0.560	0.002	Reject Ho	Significant
Instructional Delivery	0.167	0.230	Failed to Reject Ho	Not Significant
Assessment of Learning	0.152	0.224	Failed to Reject Ho	Not Significant

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

Table 9. Linear Regression: Significant Factors Predicting the Classroom Social Dynamics in terms of Teacher-to-Student Interaction

The linear regression analysis in Table 10 identifies materials development as a significant predictor of classroom social dynamics in teacher-to-student interaction, with a negative coefficient ($\beta = -0.560$, $p = 0.002$), signifying that greater prominence on materials development is associated with lower teacher-to-student interaction. This contrasts with some literature suggesting well-developed materials can support effective teaching and interaction (Hattie, 2009). Lesson planning, classroom management, instructional delivery, and assessment of learning are not significant predictors here. The significant negative impact of materials development could indicate that over-reliance on materials might limit teacher flexibility in engaging with students (Kirkpatrick, 2013).

Part 4. Challenges Experienced by Teachers in Integrating Emerging Technology on Instructional Practices

Challenges Experienced	Mean	Verbal Interpretation
1. Lack of reliable internet access in the classroom.	4.18	Often Experienced
2. Limited availability of teaching devices (e.g., computers, tablets, projectors).	3.85	Often Experienced
3. Inadequate technical support or IT assistance for troubleshooting technology issues.	3.59	Often Experienced
4. Lack of professional development opportunities for integrating technology in teaching.	3.74	Often Experienced
5. Difficulty in keeping up with new and emerging technologies.	3.81	Often Experienced
6. Uncertainty about how to effectively integrate technology into lesson planning.	3.68	Often Experienced
7. Limited support from school administration for technology integration.	3.61	Often Experienced
8. Misalignment between curriculum requirements and available technology resources.	4.03	Often Experienced
9. Time-consuming preparation of tech-based instructional materials.	3.82	Often Experienced
10. Resistance to change from traditional teaching methods to technology-enhanced instruction.	3.89	Often Experienced
Grand Mean:	3.82	Often Experienced

Table 10. Mean Ratings on the Challenges Experienced by Teachers in Integrating Emerging Technology on Instructional Practices

The mean ratings in Table 10 show that, with a grand mean of 3.82, teachers frequently encounter a variety of difficulties when incorporating new technologies into classroom social dynamics. Top challenges include lack of reliable internet access (4.18), misalignment between curriculum and technology resources (4.03), and resistance to change from traditional

methods (3.89). These align with the literature, which highlights infrastructure and adaptability as key barriers to technology integration (Ertmer, 1999; Cuban, 2001). Limited technical support (3.59) and professional development opportunities (3.74) also pose significant hurdles, echoing findings on teacher preparedness (Hew & Brush, 2007).

Part 5. Actions Implemented by the Teachers to Address the Challenges Encountered

Actions Taken	Mean	Verbal Interpretation
1. I use offline or low-bandwidth tools and prepare backup resources when internet access is unreliable.	4.45	Often Implemented
2. I integrate shared or alternative tools and maximize the use of available devices for students.	4.37	Often Implemented
3. I seek assistance from colleagues and the ICT coordinator to share the best practices for integrating technology in the classroom.	4.20	Often Implemented
4. I actively pursue professional development opportunities, such as workshops or online courses, to improve my skills in technology integration.	4.31	Often Implemented
5. I research online tutorials and stay updated on current trends in educational technology.	4.48	Often Implemented
6. I consult colleagues or online communities for best practices in integrating technology.	3.97	Often Implemented
7. I collaborate with colleagues and advocate for better support and resources.	4.23	Often Implemented
8. I adapt my teaching strategies to align technology use with curriculum goals.	4.30	Often Implemented
9. I reuse, modify, or source ready-made digital materials to save time on preparation.	4.19	Often Implemented
10. I reflect on and gradually improve my teaching strategies after each class session.	4.01	Often Implemented
Grand Mean:	4.25	Often Implemented

Table 11. Mean Ratings on the Actions Implemented by the Teachers to Address the Challenges Encountered

The results indicate that teachers actively direct technology integration challenges, as reflected by the grand mean of 4.25, indicating strong proactive engagement. Teachers frequently research online tutorials, update their technological procedures, and seek support from colleagues. Recent studies affirm that continuous professional learning and peer collaboration are key factors in successful technology integration (Scherer et al., 2021; Tondeur et al., 2021). Additionally, reflective evaluation of digital tools and access to institutional technical support enhance teachers' confidence and instructional effectiveness (Bond et al., 2021; Howard et al., 2021). These findings suggest that teachers are adaptable and resourceful, relying on both self-directed learning and collaborative networks to overcome technology-related challenges.

Conclusion and Recommendations

This study concludes that the integration of emerging technologies in instructional practices significantly influences classroom social dynamics among senior high school teachers in the Sariaya District, Division of Quezon. The findings reveal that technology integration is generally at a moderate level across key domains, including lesson planning, classroom management, instructional materials development, instructional delivery, and assessment of learning. While teachers demonstrate confidence in using basic and multimedia digital tools, the use of advanced technologies such as artificial intelligence and learning management systems remains limited.

Moreover, classroom social dynamics are found to be strong, particularly in teacher-to-student interactions, indicating that technology does not diminish interpersonal relationships but instead supports meaningful engagement. The results further confirm that instructional delivery and assessment of learning significantly enhance student-to-student interaction, while instructional materials development plays a significant role in teacher-to-student interaction. Despite existing challenges such as limited resources and insufficient training, teachers show adaptability and initiative in integrating technology into their teaching practices.

Overall, the study rejects the null hypothesis and affirms that the strategic and pedagogical integration of emerging technologies positively affects classroom social dynamics.

The findings of this study have important implications for educational practice, policy, and future research. First, the moderate level of technology integration highlights the need for continuous and targeted professional development programs that focus not only on basic digital skills but also on advanced technological applications such as AI tools and learning management systems. Strengthening teachers' digital competencies is essential for maximizing the potential of technology in education.

Second, the positive relationship between technology integration and classroom social dynamics suggests that technology can be effectively used to foster collaboration, communication, and engagement among learners. Educators are encouraged to design interactive and student-centered learning experiences that leverage digital tools to enhance both academic and social outcomes.

Third, the challenges identified in this study emphasize the need for stronger institutional support, including improved technological infrastructure, reliable internet access, and accessible technical assistance. Educational leaders and policymakers must prioritize investments in these areas to ensure equitable and effective technology integration.

Finally, the study underscores the importance of aligning technology integration with curriculum goals and instructional practices. Future research is encouraged to further explore the impact of emerging technologies on student outcomes and to examine these relationships in different educational contexts to strengthen the generalizability of the findings.

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Data Availability Statement

The data that support the findings of the study are available from the corresponding author upon reasonable request.

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Appendices

No appendices are attached to this study.