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Educators' 21st-century skills and teaching performance at public secondary schools

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Abstract

This study examined the relationship between educators' 21st-century skills and teaching performance at San Jose National Agricultural and Industrial High School. Specifically, it assessed teachers' levels of creativity and innovation, information, media, and technology skills, collaboration, and critical thinking. It evaluated how these skills relate to performance ratings based on the Individual Performance Commitment and Review Form (IPCRF). An exploratory sequential design was employed, with 96 teacher-respondents participating in the study. Data were analyzed using weighted means, structural path analysis, and effect size measurements. Findings revealed that teachers generally demonstrated a very high level of 21st-century skills, with collaboration and critical thinking receiving the highest ratings. Teaching performance was predominantly rated as Outstanding, indicating strong professional competence. Structural analysis showed a statistically significant but negative relationship between creativity and innovation and teaching performance, while the effect of critical thinking on performance was not statistically significant. These results suggest that the IPCRF may primarily reward procedural compliance and routine instructional practices rather than innovative or higher-order teaching skills. The study concludes that although teachers possess the necessary 21st-century skills for modern education, current evaluation frameworks may not fully capture or reward these competencies. It is recommended that professional development programs and performance assessment tools be refined to recognize better and support innovative and reflective teaching practices.

Keywords: educators'21st century skills, academic performance, individual performance, Commitment and Review Form (IPCRF), teachers' performance, teacher professional development

Educators' 21st-century skills and teaching performance at public secondary schools

1. Introduction

The 21st century has brought significant changes in education, requiring teachers to possess not only content knowledge but also essential competencies such as communication, collaboration, critical thinking, creativity, and digital literacy. These 21st-century skills are crucial in ensuring effective teaching and learning in a rapidly changing, technology-driven educational environment. As education systems shift toward learner-centered and technology-integrated approaches, teachers are expected to adopt innovative instructional strategies that enhance learner engagement and improve academic outcomes.

In response to these global demands, the Department of Education (DepEd) in the Philippines has implemented key policy reforms such as the K to 12 Curriculum and the Philippine Professional Standards for Teachers (PPST)(DepEd Order No. 21, s. 2019). These policies emphasize the integration of 21st-century skills in classroom instruction and highlight the importance of pedagogical practices that are constructivist, inquiry-based, reflective, and collaborative. Teachers are therefore expected to demonstrate not only mastery of subject content but also the ability to facilitate higher-order thinking skills among learners through effective instructional delivery. At the school level, particularly in San Jose National Agricultural and Industrial High School, teachers play a vital role in implementing these educational reforms. As a public secondary institution, the school serves a diverse group of learners who require adaptive and innovative teaching strategies to meet their academic needs. Teachers are expected to integrate digital tools, foster collaboration, and apply student-centered approaches to enhance classroom instruction and improve overall teaching performance. However, variations in the level of 21st-century skills among teachers may influence the effectiveness of their instructional practices and classroom outcomes. Cabahug et al. (2024) Teachers who demonstrate high levels of 21st-century skills (communication, collaboration, critical thinking, and digital literacy) also show higher teaching performance levels, particularly in instructional delivery and classroom engagement. It suggests that teachers who possess strong 21st-century skills tend to demonstrate higher levels of teaching performance, particularly in areas such as instructional delivery, classroom management, learner engagement, and assessment practices. Conversely, challenges such as limited access to training, insufficient digital resources, and workload constraints may hinder the full implementation of these competencies in actual classroom settings. These issues highlight the need to examine further the relationship between teachers' 21st-century skills and their performance within the school context.

Therefore, this study aims to determine the relationship between 21st-century skills and teachers' performance among teachers of San Jose National Agricultural and Industrial High School. The findings of this study may serve as a basis for improving instructional practices, designing targeted professional development programs, and strengthening the implementation of DepEd policies within the school. Recent systematic reviews (Manuel, 2025) show that teachers must develop strong 21st-century competencies to manage modern classrooms effectively. It was found that technology-based teacher training enhances critical thinking, creativity, communication, collaboration, and digital literacy, which are essential components of teacher effectiveness in 21st-century education. This study focused on determining 21st-century skills and teachers' performance in Public Secondary Schools. In response to the rapidly changing world, education plays a vital role in equipping students to face and engage with emerging challenges effectively.

Statement of the Problem - This study aimed to determine the relationship between 21st-century skills and teachers' performance in San Jose National Agricultural and Industrial High School. (1) What skills are consistently demonstrated by teachers who effectively implement 21st - century learning frameworks? (2)What is the level of 21st century skills demonstrated by teachers of San Jose National Agricultural and Industrial High School in terms of creativity and innovation, information, media and technology skills, collaboration and critical thinking (3) What is the level of respondents' teaching performance based on their Individual Performance

Commitment and Review Form (IPCRF) (4)Is there a significant relationship between the teachers' 21st century skills and their teaching performance? (5) What Instructional Development Plan may be formulated to improve the teachers' 21st-century skills and their teaching performance?

Significance of the Study - This study concerning the 21st-century skills and teachers' performance would greatly benefit the following: first, the Head Teacher and Master Teachers. The study will eventually benefit the head teachers and master teachers, since the results may provide new opportunities to develop teaching strategies for the improvement of the 21st-century skills of teachers. Learners, as the primary beneficiaries of this study, may provide new opportunities for improvement. Better teacher inputs are better student outputs. The Local Government Unit of San Jose serves as a basis for planning and implementing programs that support teachers' professional development. The parents are one of the key stakeholders in education who influence how these skills are understood, valued, and operationalized in children's learning. The Public Secondary Teachers, the result of this study may help them determine specific areas for improvement when it comes to teaching skills and strategies that contribute to enhancing teaching performance, the School Administrations and Supervisors. The study serves as a basis for identifying 21st-century skills and teachers' performance,e and it will help them develop necessary actions in helping their teachers improve their performance that will, in effect,t reflect their management and administrative performances. For Teacher Education Institutions, this study can be helpful in developing their educational programs on enhancing 21st-century skills and teachers' performance. Moreover, finally, Future Researchers, the conducted studies will further open doors for future researchers to expand studies in relation to 21st-century skills and teachers' performance.

Scope and Delimitation of the Study - This study was focused on determining the teachers' 21st-century skills and their teaching performance. Specifically, it examines key skill areas such as creativity and innovation, information, media and technology skills, collaboration, and critical thinking, and how these relate to teachers' effectiveness in the classroom. The respondents of the study are the teachers of San Jose National Agricultural and Industrial High School during the School Year 2025–2026. Data are gathered using a structured questionnaire and relevant school records to assess both 21st-century skills and teaching performance. The study is limited to a selected 96 teachers within the said institution and does not include students, parents, or teachers from other schools. It also focused only on measurable indicators of teaching performance based on existing evaluation tools, the Individual Performance Commitment and Review Form(IPCRF), and does not cover other factors such as personal life, psychological conditions, or external socio-economic influences. The main purpose of the study was to identify the relationship between the 21st-century skills and teachers' performance. It used an exploratory sequential research design, resulting in over a month of data collection.

2. Methodology

Research Design - This mixed-methods research used an exploratory sequential research design, integrating both qualitative and quantitative approaches to comprehensively investigate the 21st-century skills of the teachers in San Jose National Agricultural and Industrial High School. In the qualitative phase, the researcher gathered detailed information about teachers' 21st-century skills and teachers' performance through survey questions. This phase aims to explore teachers' experiences, perceptions, and practices in developing and applying 21st-century skills such as creativity and innovation, information, media and technology, collaboration, and critical thinking. The data collected in this phase were analyzed to identify common themes and patterns. These findings served as the basis for developing a quantitative research instrument, such as a structured questionnaire (Creswell & Clark, 2017).

In the quantitative phase, the developed instrument was administered to a larger group of respondents. This phase aims to measure and determine the level of teachers' 21st-century skills and their relationship to teaching performance. Statistical analysis was used to interpret the data and identify significant relationships between variables. Finally, the results from both qualitative and quantitative phases were integrated to provide a more comprehensive understanding of how teachers' 21st-century skills influence their teaching performance. The

exploratory sequential design allows the researcher first to understand the phenomenon in depth and then to validate and quantify the findings, making the results more reliable, meaningful, and contextually grounded.

Respondents of the Study - The respondents of this study were the 96 permanent secondary school teachers of San Jose National Agricultural and Industrial High School for the school year 2025–2026. The respondents were selected through complete enumeration, wherein all members of the target population were included in the study. Since the population size was manageable and accessible, every permanent teacher was considered a respondent to ensure a complete and accurate representation of the entire teaching workforce of the school. This approach was used to obtain more reliable and comprehensive data regarding the teachers' 21st-century skills and teachers' performance, as it eliminates sampling bias and ensures that all eligible teachers are given equal opportunity to participate in the study.

Research Instrument - The main instrument used in this study is a researcher-made survey questionnaire designed to determine the level of teachers' 21st-century skills in relation to their teaching performance. The questionnaire consists of four indicators of the 21st-century skills, namely: creativity and innovation, information, media and technology skills, collaboration, and critical thinking skills. A total of 40 items are included in the instrument, distributed as follows: Creativity and Innovation – 10 items; Information, Media, and Technology Skills – 10 items; Collaboration – 10 items; and Critical Thinking Skills – 10 items. The 40-item questionnaire was tested for reliability using the split-half method. After having administered the research instrument to 30 respondents from Pedro T. Mendiola Sr. Memorial National High School, the reliability of the instrument was evaluated using the Split-Half test to determine the internal consistency of four key domains of the 21st-century skills demonstrated by the teachers. The reliability is determined by the Spearman-Brown coefficient, which estimates the reliability of the full-length test based on the halves. The Split-Half method divides the items into two sets, odd-numbered and even-numbered items, to see how well the two halves correlate. The analysis by domain is presented in Table 1 based on coefficients of equal length. The respondents answered using a 5-point Likert Scale, as follows:5 Very Highly Agree (VHA),4 Highly Agree (HA),3 Moderately Agree (MA), 2 Least Agree (LA), and 1 Disagree (D). The respondents placed a check (✓) on the corresponding scale that best describes their level of agreement for each statement. Each response was assigned a numerical value from 1 to 5. The total score for each indicator was computed and divided by the number of items to obtain the weighted mean. The overall mean was used to determine the level of teachers' 21st-century skills.

Table 1
Results of the Reliability Analysis for Teachers. 21st Century Skills

Items	Number of Items	Reliability Coefficients*	Analysis
21st Century Skills Demonstrated by Teachers (10 items each)			
1. Creativity and Innovation	10	0.866	High Reliability
2. Information, Media, and Technology Skills	10	0.941	Very High Reliability
3. Collaboration	10	0.959	Very High Reliability
4. Critical Thinking	10	0.956	Very High Reliability

*Based on coefficients of equal length

Across all domains, the Spearman-Brown coefficients ranged from .866 to .959. These coefficients exceeded the common reliability threshold of .70, which is generally considered reliable. Therefore, the instrument demonstrates a very high internal consistency and reliability for measuring these specific skills. The instrument is considered a consistent and dependable tool for data collection.

Data Gathering Procedure - For the qualitative data, upon the approval of the school principal, the researcher used an interview guide and gathered data online through a group chat in the Messenger application over a five - day data collection cycle. The collected responses were transcribed and transferred to a Word document, ensuring that each transcript was properly labeled and organized to facilitate accurate and systematic analysis. The researcher then proceeded to read the data carefully while taking down notes of the emergent ideas, patterns, and insights observed. This was followed by the coding process, where the researcher assigned colors to each theme and developed headings based on relevant text excerpts grouped under their respective themes. Finally, the

researcher developed a thematic analysis through a diagram to highlight the basis of the quantitative analysis following the technique. For the quantitative data, the researcher administered an online survey questionnaire using Google Forms. Prior to its administration, the instrument was pilot-tested to ensure reliability and validity. Upon approval of the school principal for the conduct of the reliability test, the survey was disseminated to the target respondents and was conducted within a five-day data collection cycle to ensure adequate response time. All responses were automatically recorded and organized for statistical analysis. The collected data were automatically organized into a spreadsheet, ensuring accurate and efficient recording. The researcher then conducted data cleaning to detect and correct any missing or inconsistent responses. Subsequently, the data underwent descriptive statistical analysis. To examine the relationships among variables, inferential statistical techniques such as correlation and regression analysis were performed with the assistance of a statistician. Finally, the findings were then visualized through a table to aid their interpretation. This process was also adhered to Creswell's (2014) framework for quantitative research, ensuring systematic and reliable analysis.

Statistical Treatment of Data - The following statistical tools were utilized to address the research problems. The weighted mean was employed to describe the 21st-century skills of the teacher-respondents. For inferential analysis and hypothesis testing, Partial Least Squares–Structural Equation Modeling (PLS-SEM) was applied, with results generated using WarpPLS version 7.0. In describing the responses, frequency and percentage distribution were also used. A five-point Likert scale was adopted to interpret the level of responses, where a mean score of 4.20–5.00 indicated a very high level, 3.40–4.19 a high level, 2.60–3.39 a moderate level, 1.80–2.59 a low level, and 1.00–1.79 a very low level. Furthermore, the interpretation of the effect size of the path coefficient (β) was based on established thresholds: a value of 0.02 was considered small, 0.15 as medium, and 0.30 as large.

Ethical Consideration - The researcher complied with the research guidelines provided by the Graduate School of the Divine Word College of San Jose. The purpose of the study and the participation of the respondents were first explained before administering the questionnaire. The data gathering took two weeks to complete, during which the respondents' confidentiality of information and /or answers and their anonymity were maintained throughout the data collection, analysis, and presentation of findings. It was ensured that all data and results collected were solely used for the study. The American Psychological Association (APA), 7th Edition, was employed to give credit to the authors of research studies used as references. On the other hand, previous studies and sources that were used as bases for this study were properly cited and acknowledged. This study contributes to the education sector and carries no risk to anyone involved in its conduct.

3. Results and Discussion

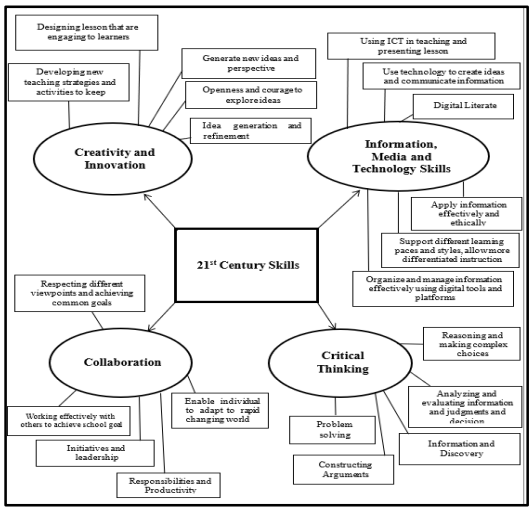

Figure 1. Initial Thematic Map for 21st Century Skills

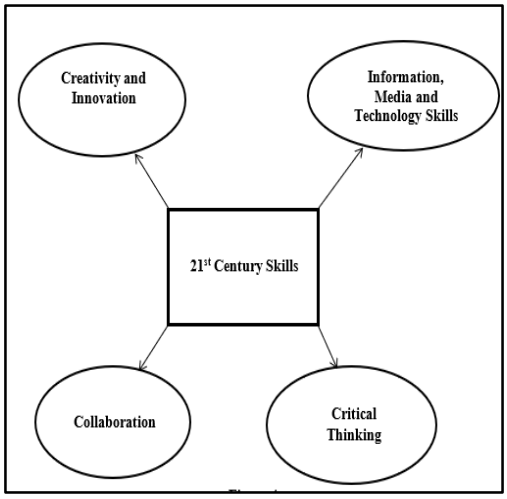

Figure 2. Final Thematic Map for 21st Century Skills

For the qualitative approach, the researcher conducted interviews with teachers, who were asked about the 21st-century skills that they have. The responses were carefully reviewed and familiarized with the data. Common responses were transcribed and coded, and the coded transcripts were then organized into themes. This study revealed that 21st-century skills are common among teachers. The responses are designing lesson that are engaging to learners, Developing new teaching strategies and activities to keep, generate new ideas and perspective openness and courage to explore ideas, idea generation and refinement, using ICT (Information Communication Technology) in teaching and presenting lesson, use technology to create ideas and communicate information, digital literate, apply information effectively an ethically, support different learning paces and styles, allow more differentiated instruction, organize and manage information effectively using digital tools and platforms, reasoning and making complex choices, analyzing and evaluating information and judgment and decision, information and discovery, constructing arguments problem solving, enable individual to adapt to rapid changing world, responsibilities and productivity, initiative and leadership, working effectively with others to achieve school goal, respecting different viewpoints and achieving common goals. Voogt and Knezek's (2024) systematic review on ICT integration in secondary education found that the effective use of technology in teaching depends not only on access to tools but also on teachers' attitudes, motivation, and pedagogical knowledge. The study stressed that successful integration occurs when technology is aligned with learning objectives and supported by appropriate skills development. The four emerging themes presented in Figure 2 —creativity and innovation, information, media and technology skills, critical thinking, and collaboration—served as the foundation for the development of the research questionnaire. These themes reflect the core domains of 21st-century skills, which are consistently emphasized in contemporary educational research as essential competencies for effective teaching and learning in modern classrooms. Brown et al. (2024) emphasized that creativity is fostered through student-centered and innovative teaching approaches that respond to diverse learners' needs. Voogt et al. (2024), ICT competence is a multi-dimensional construct that includes information literacy, communication, digital content creation, and problem-solving. Demircioglu et al. (2023) explained that learners develop critical thinking skills when they are engaged in discussion, argumentation, and problem-solving activities. Gillies (2024) emphasized that collaboration enhances both academic and interpersonal skills by encouraging students to engage in cooperative problem-solving and collective knowledge construction.

Table 2

Mean Level of Teachers' 21st Century Skills in terms of Creativity and Innovation, and Information Media and Technology Skills

Creativity and Innovation	Weighted Mean	Interpretation
1. I can give my own interpretations of ideas.	4.39	Very High
2. I employ a variety of techniques to ensure a smooth flow of learning.	4.43	Very High
3. I enjoy doing exceptional things.	4.24	Very High
4. I have a broad imagination.	4.21	Very High
5. I incorporate educational digital resources like TikTok.	3.82	High
6. I look beyond what I see; I am open to new ideas.	4.63	Very High
7. If I do not understand something, I ask my superior.	4.77	Very High
8. I always encourage learners to be creative.	4.76	Very High
9. I can do beyond what is expected of me.	4.39	Very High
10. I can simplify the explanation when somebody asks me about something.	4.30	Very High
Composite Mean	4.39	Very High
Information, Media, and Technology Skills		
1. I can do activities using my computer skills.	4.42	Very High
2. I often do activities using different technologies.	4.14	High
3. I find E-learning effective when applied in lectures.	4.43	Very High
4. I have computer skills that help me prepare the lesson effectively.	4.42	Very High
5. I often use the internet to formulate my lesson plans.	4.26	Very High
6. I take advantage of technological developments to support my presentation.	4.42	Very High
7. I benefit much from technology.	4.58	Very High
8. I can easily detect fake news in a social media posting.	3.90	Very High
9. I use innovative technological developments for teaching strategies.	4.34	Very High
10. I teach more easily with the help of different social media platforms.	4.20	Very High
Composite Mean	4.31	Very High

legend: 4.20-5.00 Very High Level; 3.40-4.19 High Level; 2.60-3.39 Moderate Level; 1.80-2.59 Low Level;1.00-1.79 Very Low Level

Table 2 presents the weighted mean distribution of teachers' responses on creativity and innovation, one of the indicators of 21st-century skills. Overall, the results reveal a composite mean of 4.39, which is interpreted as Very High. This indicates that teachers demonstrate a strong level of creativity and innovation in their teaching practices. In connection with that, Suyuti (2024) stressed that integrating creativity and innovation in education leads to improved learning quality, increased student engagement, and better preparation for future workforce demands. The findings suggest that an education system that promotes innovation helps learners become adaptable and competitive in a rapidly changing global environment. Isaacson (2025)highlighted that creativity in the classroom is strengthened when teachers adopt flexible and innovative instructional strategies that cater to the diverse needs of learners. Overall, the findings imply that teachers possess strong creativity and innovation skills, particularly in idea generation, adaptability, and student engagement. However, there is still a need to further enhance furthere their competence in using digital resources to optimize innovative teaching within the context of 21st-century education fully.

Moreover, teachers demonstrate a very high level of information, media, and technology skills, particularly in terms of technology utilization, digital resource integration, and instructional innovation. Nevertheless, strengthening teachers' critical evaluation of digital content and expanding their use of varied technologies could further enhance their effectiveness in delivering 21st-century education. This indicates that while teachers are fairly proficient in using technology, they may need additional support in media literacy, particularly in critically evaluating digital content, a concern noted in recent studies that identify digital discernment as an ongoing challenge for many educators. Hobbs & Coiro (2022). Additionally, expanding the range and depth of technology use beyond basic routines can further improve instructional innovation (Kimmons & Hall, 2023). Overall, the findings suggest that teachers demonstrate a very high level of information, media, and technology skills, particularly in technology utilization and digital integration. Nevertheless, there is a continued need for targeted professional development in media literacy and diversified technology use to support 21st-century teaching and learning fully.

Table 4

Mean Level of Teachers' 21st Century Skills in terms of Collaboration and Critical Thinking

Collaboration	Weighted Mean	Interpretation
1. I enjoy participating in decision-making.	4.59	Very High
2. I listen well when someone is giving instructions.	4.64	Very High
3. I respect each other's responsibilities	4.76	Very High
4. I feel comfortable sharing my opinions with my fellow teachers without fear of negative consequences.	4.59	Very High
5. I understand how my work directly contributes to the overall success of our school.	4.68	Very High
6. I show my ideas to others to come up with a joint decision.	4.57	Very High
7. I consider the suggestions of my fellow teachers.	4.53	Very High
8. I actively participate in group discussions.	4.73	Very High
9. I work to build consensus within my group when making decisions.	4.41	Very High
10. I am comfortable working with my fellow teachers.	4.69	Very High
Composite Mean	4.62	Very High
Critical Thinking		
I can see the pros and the cons before I make a decision.	4.59	Very High
I can decide whatever is good in myself as a teacher.	4.61	Very High
I consider circumstances before making decisions.	4.66	Very High
I consider whatever is best for every learner.	4.49	Very High
I can assist my colleagues in making the right decisions.	4.53	Very High
I evaluate situations objectively before making a decision.	4.26	Very High
I can evaluate my students' outputs.	4.57	Very High
I can analyze classroom situations.	4.78	Very High
I accept my failure.	4.69	Very High
I perform my task fairly, considering the students' individual differences.	4.82	Very High
Composite Mean	4.60	Very High

Legend: 4.20-5.00 Very High; 3.40-4.19 High; 2.60-3.39 Moderate; 1.80-2.59 Low;1.00-1.79 Very Low

Table 4 shows the mean scores for teachers' 21st-century skills in terms of collaboration. The composite mean of 4.62, interpreted as "Very High," indicates that teachers consistently demonstrate strong collaborative skills in

the school environment. It shows that teachers possess strong collaboration skills, demonstrated by active participation, respectful communication, and shared responsibility. Such high collaboration fosters cohesion, professional trust, and effective problem-solving, which are essential for achieving school-wide goals and supporting student success. Overall, these results suggest that teachers' collaboration skills significantly contribute to a positive school culture and collective professional efficacy, aligning with recent studies emphasizing collaboration as a core 21st-century competency. Johari et al. (2022); Trust (2021). Moreover, in terms of critical thinking skills. The composite mean of 4.60, interpreted as "Very High," indicates that teachers consistently demonstrate strong critical thinking abilities in their professional practice. These scores indicate that teachers are self-aware, reflective, and capable of analyzing complex situations to make informed, objective decisions. Overall, high levels of critical thinking among teachers support better problem-solving, decision-making, and reflective practices in schools, which are essential for effective 21st-century teaching (Schleicher,2023). The study yielded several significant findings. First, in identifying the skills consistently demonstrated by teachers who effectively implement 21st-century learning frameworks, interview responses were grouped into four major themes: creativity and innovation, information, media and technology skills, collaboration, and critical thinking. These themes highlight the essential competencies that enable teachers to adapt to modern educational demands. Second, the level of 21st-century skills demonstrated by teachers of San Jose National Agricultural and Industrial High School was found to be very high across all dimensions. Specifically, creativity and innovation obtained a weighted mean of 4.39, while information, media, and technology skills registered a weighted mean of 4.31. Collaboration recorded the highest among the four dimensions with a weighted mean of 4.62, and critical thinking also showed a very high level with a weighted mean of 4.60. These results indicate that teachers possess strong competencies in key areas required for 21st-century teaching. Third, in terms of teaching performance based on the Individual Performance Commitment and Review Form (IPCRF), the majority of teachers achieved an Outstanding rating. A total of 91 respondents, or 94.8%, fell within the rating range of 4.500–5.000, while only 5 respondents, or 5.2%, obtained a Very Satisfactory rating ranging from 3.500–4.499. This suggests that most teachers demonstrate a high level of professional performance. Fourth, the findings revealed a significant relationship between teachers' 21st-century skills and their teaching performance. Teachers who exhibit high levels of creativity and innovation are more likely to design engaging, flexible, and learner-centered activities aligned with IPCRF performance indicators. Likewise, strong critical thinking skills enable teachers to effectively analyze student needs, address classroom challenges, and make informed instructional decisions.

Finally, an Instructional Development Plan (IDP) was proposed to enhance teachers' competencies and performance further. The plan focuses on strengthening 21st-century skills, particularly in creativity and innovation, as well as critical thinking. It includes specific objectives, structured activities, designated persons involved, timelines, expected outcomes, and corresponding budget allocations. Overall, the plan is designed to improve instructional quality and ensure that teachers are better equipped to meet the evolving demands of modern education.

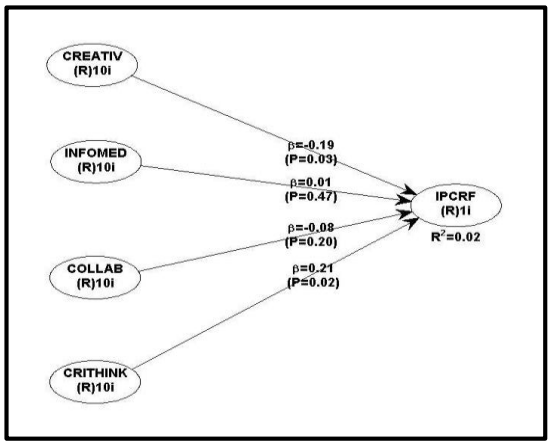

Figure 3. Structural Model of the Relationship Between 21st Century Skills of Teachers and Teaching Performance

The hypothesized relationship between the variables in the study is presented through a structural model displayed in Figure 5. The exogenous variable, 21st century skills, is described by creativity and innovation (CREATIV), information, media, and technology skills (INFOMED), collaboration (COLLAB), and critical thinking (CRITHINK). These variables are directly linked to the endogenous variable, teaching performance, which is measured by IPCRF rating. These four combined skills reveal low explanatory power (R^2=0.02), explaining only 2% of the variance in teaching performance (IPCRF). This confirms that 98% of what determines a teacher's IPCRF score comes from factors not included in this model, such as school resources or administrative support. The strength of the influence of these skills generates beta coefficients from 0.01 to 0.21. The significance of the strength yielded p-values from .02 to .47, with two values exceeding the .05 significance threshold. Darling-Hammond et al. (2024) explain that instructional effectiveness is strongly dependent on systemic factors such as curriculum structure, institutional expectations, and support mechanisms, rather than teacher skills alone.

Table 5
Path Coefficients and p-values for Ho

Path	Beta (β) Coefficient	p-value*	Interpretation
Ho: 1st Century Skills→Teaching Performance (IPCRF)			
CREATIV→IPCRF	-0.187	0.028	Significant
INFOMED→IPCRF	0.008	0.467	Not Significant
COLLAB→IPCRF	-0.084	0.202	Not Significant
CRITHINK→IPCRF	0.207	0.017	Significant

*Significant at p<.05

Table 5 presents the structural paths between four dimensions of 21st Century Skills and Teaching Performance (IPCRF). The statistical significance is determined by the p-value, using the standard alpha threshold of 0.05. Critical thinking skills appear to be the highest positive predictor (®=0.207, p=0.017). Since p< 0.05, there is a statistically significant positive relationship between critical thinking skills and teaching performance. This suggests that teachers who demonstrate higher levels of logical reasoning and problem-solving tend to receive higher IPCRF ratings. The findings of the structural path analysis revealed that among the four dimensions of 21st Century Skills, critical thinking skills emerged as the highest positive predictor of teaching performance as measured by the Individual Performance Commitment and Review Form (IPCRF) (β = 0.207, p = 0.017). Since the p-value is less than the standard alpha level of 0.05, the relationship is considered statistically significant. This indicates that teachers who demonstrate higher levels of logical reasoning, analytical thinking, and problem-solving abilities tend to achieve higher performance ratings in the IPCRF. The result suggests that the capacity of teachers to analyze situations, make sound instructional decisions, and address classroom challenges effectively contributes positively to their overall teaching performance.

Meanwhile, the teachers' skill in creativity and innovation shows a significant but negative relationship (®=-0.187, p=0.028). Because p<0.05, the relationship is statistically significant. However, the negative coefficient indicates that higher self-reported or measured creativity scores are associated with a slight decrease in IPCRF ratings in this model. The findings indicate that creativity and innovation skills have a statistically significant but negative relationship with teaching performance as measured by the Individual Performance Commitment and Review Form (IPCRF) (β = -0.187, p = 0.028). Since the p-value is lower than the standard alpha level of 0.05, the relationship is considered statistically significant. However, the negative beta coefficient suggests that higher levels of self-reported creativity and innovation are associated with a slight decrease in IPCRF ratings within the model. This implies that while teachers may demonstrate creative and innovative practices, these may not be strongly reflected or emphasized in the current performance evaluation criteria, potentially leading to lower or less directly aligned IPCRF ratings. Surprisingly, collaboration and information, media, and technology skills both failed to reach significance. Collaboration (®=-0.084, p=0.202) and Information Literacy (®=0.008, p=0.567) both have p-values greater than 0.05. This indicates that, for this group of teachers, these two skills do not have a significant impact on their teaching performance ratings.

The findings revealed that creativity and innovation skills have a statistically significant but negative relationship with teaching performance as measured by the Individual Performance Commitment and Review

Form (IPCRF) (β = -0.187, p = 0.028). Since the p-value is less than the standard alpha level of 0.05, the relationship is considered statistically significant. However, the negative beta coefficient indicates that higher levels of self-reported creativity and innovation are associated with a slight decrease in IPCRF ratings in the model. This suggests that although teachers may demonstrate creative and innovative practices in their teaching, these competencies may not be fully captured or emphasized in the current performance evaluation criteria used in the IPCRF, which may explain the observed negative association. These results lead to the decision to partially reject the null hypothesis of no significant relationship between the teachers' 21st-century skills and their teaching performance. This confirms that there is no significant relationship between 21st-century skills and teaching performance. The findings suggest that the current performance tool (IPCRF) prioritizes standardized procedures over creative instructional methods. Vasquez Montoya et al.(2025) study found that creativity and innovation play a crucial role in enhancing learners' cognitive, emotional, and intellectual development. However, it also highlighted that many educators still struggle to effectively apply creative approaches in teaching, indicating a gap between theory and practice.

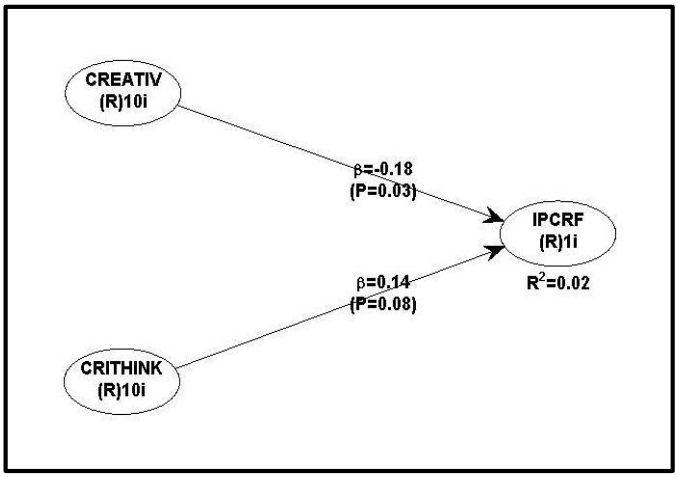

Figure 4. Emerging Model of the Relationship Between 21st Century Skills of Teachers and Teaching Performance

The emerging model in Figure 4 represents a refined version of the structural analysis, focusing only on the variables that demonstrated the most relevant influence on teachers' performance (IPCRF). In this new model, two non-significant paths have been removed to show a clearer picture of the final results. Even with the model refined, the R2 remains at 0.02. This means that creativity, innovation, and critical thinking together only account for 2% of the variance in teaching performance. Since the model only explains 2% of the performance, it can be noted that 21st-century skills, while theoretically important, are not the primary measures by which teachers are currently being officially evaluated. Voogt et al. (2024) highlight that 21st-century skills such as creativity and critical thinking are primarily reflected in instructional processes rather than formal evaluation metrics, which may not fully capture their influence in standardized performance systems.

Table 6

Beta Coefficients of the Paths and p-values for Ho2

Paths	Beta (β) Coefficient	p-value*	Standard Error	Effect Size**	Interpretation
Ho: 1st Century Skills→Teaching Performance (IPCRF)					
CREATIV→IPCRF	-0.180	.033	.097	.017	Small
CRITHINK→IPCRF	0.141	.076	.098	.004	Negligible

*Significant at p<0.05

** Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large

Table 6 discloses the beta coefficients of the paths in the emerging model with the corresponding p-values. The structural analysis evaluates the predictive impact of two specific 21st-century skills on teaching performance (IPCRF). The path CREATIV□IPCRF is statistically significant, showing a beta coefficient of -0.180 (p=.033),

confirming an inverse relationship. Furthermore, the effect size of .017 is interpreted as small, falling just below the 0.02 threshold for a standard "small" effect. This suggests that while the relationship exists, its practical impact on performance ratings is limited. Also, in relation to the emerging model, which examines the predictive relationship between selected 21st-century skills and teaching performance as measured by the Individual Performance Commitment and Review Form (IPCRF). The structural analysis indicates that creativity and innovation significantly predict teaching performance, as evidenced by the path CREATIV → IPCRF, which yielded a beta coefficient of -0.180 with a p-value of .033. Since the p-value is lower than the 0.05 level of significance, the result suggests that the relationship between creativity and innovation and teaching performance is statistically significant.

However, the negative beta coefficient indicates an inverse relationship, implying that higher levels of reported creativity and innovation are associated with slightly lower teaching performance ratings based on the IPCRF. This unexpected direction of the relationship may be explained by the nature of the current performance evaluation system, which tends to emphasize standardized teaching procedures, documentation, and compliance with prescribed indicators rather than creative or innovative instructional approaches. As a result, teachers who apply more experimental or innovative strategies in the classroom may not necessarily receive higher ratings within the existing evaluation framework. Moreover, the effect size of 0.017 is interpreted as small, falling just below the commonly accepted threshold of 0.02 for a small effect. This indicates that although the relationship between creativity and innovation and teaching performance is statistically significant, its practical influence on IPCRF ratings is minimal. Therefore, creativity and innovation may not be a major determinant of teachers' performance scores within the current evaluation system. These findings imply that while creativity and innovation are recognized as essential competencies in 21st-century education, they may not be strongly reflected in formal performance assessment tools. This suggests the need for evaluation frameworks that better capture and value innovative teaching practices alongside traditional performance indicators. The path from critical thinking to IPCRF (®=0.141) is not statistically significant and yielded a .076 p-value exceeding the 0.05 threshold. The effect size of .004 is considered negligible. This indicates that, in this refined model, critical thinking skills do not reliably predict teaching performance scores for this group of teacher-respondents.

The structural analysis also examined the predictive relationship between critical thinking skills and teaching performance as measured by the IPCRF. The path from Critical Thinking → IPCRF yielded a beta coefficient of 0.141 with a p-value of 0.076, which exceeds the conventional significance threshold of 0.05. This indicates that the relationship is not statistically significant, meaning that, for this sample, variations in critical thinking skills do not reliably predict differences in teaching performance ratings. In addition, the effect size of 0.004 is considered negligible, suggesting that even if there were a relationship, its practical impact on performance outcomes is minimal. This result implies that teachers' ability to apply critical thinking in instructional design, problem-solving, or decision-making may not be captured or rewarded by the current performance evaluation system (IPCRF), which primarily emphasizes compliance with standardized procedures and documentation rather than the demonstration of higher-order thinking skills.

Overall, these findings suggest that, within the current framework, critical thinking skills do not play a significant role in determining teaching performance scores, highlighting a potential gap between the competencies valued in 21st-century teaching and those measured by formal performance evaluation tools. It underscores the need for evaluation frameworks that better recognize and reward analytical and reflective teaching practices. The standard errors yielded .097 and .098, representing the estimated standard deviation of the path coefficients. These values measure how much the coefficient value would likely vary if the study is repeated with a different sample of teachers from the same population. Both values are quite similar and relatively low, under .10, indicating that the measurement of these relationships is fairly consistent. The standard errors for the estimated paths in the emerging model were 0.097 and 0.098, which represent the standard deviation of the path coefficients. These relatively low and nearly identical values indicate that the estimates are stable and consistent, suggesting that the observed relationships between 21st-century skills and teaching performance would likely be similar if the study were repeated with another sample of teachers from the same population. In other words, the measurements in the

model are reasonably reliable. Conversely, the path from critical thinking to IPCRF was not statistically significant, and the effect size was negligible, suggesting that critical thinking skills do not meaningfully influence teaching performance scores in this model. This indicates that the IPCRF may not be a sensitive tool for capturing 21st-century teaching competencies, particularly those that emphasize higher-order thinking and innovation.

Overall, these findings imply that while 21st-century skills such as creativity and critical thinking are essential for modern teaching, the IPCRF appears to favor procedural compliance and routine instructional practices over innovative or reflective teaching approaches. In practice, this means that teachers who excel in applying creative strategies or critical thinking in their instruction may not see these strengths reflected in their performance ratings, highlighting a potential misalignment between contemporary teaching competencies and existing evaluation criteria. In the Philippine context, the IPCRF under the PPST framework focuses heavily on standardized indicators, which may not fully capture innovative and reflective teaching practices. These studies collectively support the implication that there is a potential misalignment between 21st-century teaching competencies and existing teacher performance evaluation systems. Department of Education. (2017). Philippine Professional Standards for Teachers (PPST). Similarly, recent literature highlights that teacher evaluation systems grounded in standardized frameworks tend to emphasize measurable and procedural aspects of teaching performance, potentially overlooking greater pedagogical skills. Kraft and Gilmour (2024) explain that many teacher evaluation models prioritize compliance with set indicators and observable classroom practices, which can reduce the recognition of innovative and higher-order teaching behaviors. As a result, teachers who employ creative or reflective instructional strategies may not receive differentiated recognition in formal evaluation systems. Voogt et al. (2024) further argue that competencies such as creativity and critical thinking are embedded within instructional processes and learner engagement, making them less visible in structured evaluation rubrics like IPCRF. This reinforces the idea that while teachers may demonstrate high levels of these skills in practice, such competencies may not be fully captured in standardized rating systems.

Table 7

Proposed Action Plan to Improve Teachers' 21st Century Skills and Their Teaching Performance

Area of Development	Objectives	Key Activities	Persons Involved	Time-line	Expected Outcome	Budget/ Resources
1. Creativity & Innovation	Encourage innovative teaching methods	- Demonstration teaching- Innovation contests (best teaching strategy)- Use of multimedia and interactive tools	Teachers, School Head	Semi-annual	More engaging and creative classroom practices	P 3,000.00 (materials, rewards, printing).
2. Information, Media & Technology Skills	Improve teachers' ability to use ICT tools in teaching	- Conduct ICT Training workshops (e.g, Google Classroom, LMS) - Peer mentoring on tech integration -Develop digital lesson plans	School Head, ICT Coordinator-Tor, Teachers	Quarterly	Increased use of technology in instruction, improved student engagement	P 5,000.00 (training materials, internet support, token).
3. Collaboration Skills	Strengthen teamwork and professional collaboration	- Learning Action Cell (LAC) sessions- Collaborative lesson planning- Team teaching activities	Master Teachers, Teachers	Monthly	Improved teamwork and shared best practices	P 3,000.00 (refresh-ment, documentation, materials).
4. Critical Thinking	Develop higher-order thinking teaching strategies	- Workshops on inquiry-based and problem-based learning- Case study analysis sessions	Instructional Leaders	Semi-annual	Improved ability to design engaging and analytical lessons	P 7,000.00 (training kits, resource materials, speaker honorarium).

The proposed development plan highlights two key areas of teacher development: Creativity and Innovation

and Critical Thinking, both of which are essential 21st-century skills that directly influence instructional quality and learner engagement. The structured activities, timelines, and expected outcomes reflect a systematic approach to strengthening teachers' pedagogical competencies in line with modern educational demands. Brown et al. (2024) explained that creativity in education is developed when teachers are given opportunities to experiment with new approaches, reflect on their practice, and integrate student-centered instructional methods. The inclusion of multimedia tools also aligns with Voogt et al. (2024), who highlighted that digital resources can enhance instructional creativity when properly integrated into teaching practice.

4. Conclusions

Based on the summary of findings, several conclusions were drawn from the study. First, the essential 21st-century skills demonstrated by teachers can be categorized into four core themes: creativity and innovation, information, media and technology skills, collaboration, and critical thinking. These themes reflect that 21st-century educators possess multidimensional competencies necessary for effective and modern teaching practices. Second, the level of 21st-century skills demonstrated by teachers of San Jose National Agricultural and Industrial High School is consistently high across all areas. In terms of creativity and innovation, teachers exhibit strong capabilities in designing engaging lessons, applying varied instructional strategies, and fostering creativity among learners.

With regard to information, media, and technology skills, teachers demonstrate competence in utilizing digital tools and integrating technology into instruction, enabling them to enhance lesson delivery and support student engagement. In collaboration, teachers display strong teamwork and interpersonal skills, actively engaging in idea-sharing, cooperative decision-making, and professional collaboration. Similarly, in critical thinking, teachers show a high level of competence in analyzing situations, making informed decisions, and effectively integrating technology to improve instructional practices and student learning outcomes. Third, although the majority of teachers achieved an Outstanding rating in their teaching performance, a small percentage received a Very Satisfactory rating. This indicates that while overall teaching effectiveness is high, there remains a need to provide additional professional support and development opportunities for some teachers to enhance their performance further. Fourth, the findings suggest the need to revisit and possibly enhance the Individual Performance Commitment and Review Form (IPCRF) framework to reflect better the holistic competencies required of 21st-century educators. Incorporating indicators that explicitly measure creativity, collaboration, and information literacy may lead to a more balanced and authentic evaluation of teacher performance, in line with global recommendations for comprehensive and future-oriented assessment systems. Finally, the proposed action plan serves as a strategic and responsive intervention aimed at addressing identified gaps and supporting the continuous professional development of teachers. Its implementation is expected to promote more innovative, collaborative, and effective teaching practices, ultimately contributing to improved student learning outcomes.

Recommendations - Based on the findings and conclusions of the study, several recommendations are proposed to enhance teachers' 21st-century skills and their overall teaching performance. Since teachers have already demonstrated strong competencies in creativity and innovation, information, media, and technology skills, collaboration, and critical thinking, schools need to sustain and strengthen these areas through continuous professional development programs. This may be achieved by conducting regular training sessions, workshops, and seminars that focus on deepening teachers' mastery of these competencies and ensuring their consistent integration into classroom instruction. Moreover, schools are encouraged to foster a culture of innovation and collaboration by organizing peer-sharing sessions and establishing professional learning communities.

To further improve specific skill areas, institutions may adopt targeted strategies. In terms of creativity and innovation, teachers may be encouraged to integrate more student-centered and engaging approaches such as project-based learning, gamification, and the use of creative multimedia tools. School administrators can support these efforts by providing appropriate instructional materials, training on digital creativity platforms, and recognition programs that motivate teachers to design innovative learning experiences. With regard to information,

media, and technology skills, teachers should be given continuous opportunities to explore modern educational platforms, learning management systems, and emerging technologies. This can be supported by improving ICT infrastructure and ensuring the availability of technical assistance to facilitate effective technology integration in teaching and learning processes. In the area of collaboration, schools may continue strengthening Learning Action Cell (LAC) sessions, mentoring programs, and team teaching initiatives. Encouraging regular peer collaboration and shared lesson planning can help sustain a strong professional learning community and enhance instructional practices across departments. Meanwhile, to develop critical thinking skills, teachers may benefit from additional training on higher-order thinking strategies such as inquiry-based learning, problem-based learning, and case analysis. School leaders may also promote reflective teaching practices to enable teachers to assess and improve their instructional decisions continuously.

Furthermore, providing structured professional development and mentoring programs is highly recommended to support teachers' ongoing growth. Coaching and peer assistance from high-performing teachers can help improve consistency in teaching performance and ensure that all educators achieve a high standard of practice. Considering that only certain 21st-century skills showed a significant relationship with teaching performance, it is also recommended that the existing performance evaluation system be reviewed and enhanced better to capture innovative, collaborative, and technology-driven teaching practices. This will ensure that teachers' modern instructional competencies are accurately recognized and rewarded. Finally, the proposed action plan plays a crucial role in bridging the gap between 21st-century teaching practices and performance evaluation. Its full implementation, supported by sufficient resources and strong administrative backing, can significantly enhance teachers' competencies in key areas such as creativity, collaboration, and information, media, and technology literacy. Continuous monitoring and regular evaluation are also necessary to assess progress, ensure effectiveness, and sustain long-term improvements in teaching performance and student learning outcomes.

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