# PREPARING FOR THE FUTURE: THE LINK BETWEEN 21ST CENTURY SKILLS AND ACADEMIC PERFORMANCE IN SENIOR HIGH SCHOOL



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# Preparing for the Future: The Link between 21st Century Skills and Academic Performance in Senior High School

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### Abstract

The development of 21st-century skills, such as critical thinking, collaboration, and digital literacy, significantly enhances the academic performance of senior high school students by equipping them with the essential tools to navigate and excel in a rapidly evolving educational landscape. Along this line, this study determined the level of 21st-century skills and academic performance among senior high school learners in the Alicia District, Bohol Division, for the school year 2018-2019 The research employed a descriptive correlational design, involving 205 senior high school learners from four schools in the district. Data were collected using a modified questionnaire based on Jason Ravitz's tool for measuring 21st-century teaching and learning, which assessed students' acquisition of skills in four dimensions: Core Subjects and 21st-century themes, Learning and Innovation Skills, Life and Career Skills, and Information, Media, and Technology Skills. Academic performance data were obtained from school officials. The findings revealed that the majority of students achieved a Very Satisfactory academic performance, with a mean score of 86.46. Respondents demonstrated moderate proficiency across all dimensions of 21st-century skills, with an overall mean score of 2.72. Life and Career Skills had the highest composite mean (2.83), followed by Learning and Innovation Skills (2.76), Information, Media, and Technology Skills (2.75), and Core Subjects and 21st-century themes (2.53). A weak but statistically significant positive correlation (r = 0.2485, p < 0.05) was found between 21stcentury skills and academic performance, suggesting that as students' proficiency in these skills increases, their academic performance tends to improve modestly. The results underscore the need for educators and policymakers to prioritize the integration of 21st-century skills into the curriculum and instructional practices.

Keywords: 21st-century skills, academic performance, critical thinking, collaboration, digital literacy

### Introduction

In the rapidly evolving educational system, the emphasis on 21st-century skills has become paramount for preparing senior high school students for future challenges. These skills are not only vital for academic success but also for students' overall development and readiness for the workforce. The integration of core subjects with contemporary themes, coupled with learning and innovation skills, life and career skills, and information, media, and technology skills, forms a comprehensive framework essential for holistic student development. 21st-century skills are crucial for success in today's rapidly evolving, technology-driven world. These skills encompass a variety of competencies, including technical skills like information and communication technology literacy and soft skills such as critical thinking, problem-solving, creativity, collaboration, and effective communication.

Research stresses the importance of integrating these skills into educational curricula to prepare students for the demands of the modern workforce and global marketplace. A systematic literature review identified core skills such as technical, communication, collaboration, creativity, critical thinking, and problem-solving, along with contextual skills like ethical awareness and lifelong learning as essential components of 21st-century competencies (van Laar et al., 2017). These skills are vital for fostering innovation and maintaining competitiveness in a knowledge-based economy, as highlighted in various educational policy documents and frameworks (Kennedy & Sundberg, 2020). Therefore, educational systems must adopt pedagogical strategies that effectively teach and assess these critical skills.

Core subjects and 21st-century themes form the foundational knowledge base for students, including traditional academic subjects like mathematics, science, and language arts, integrated with contemporary themes such as global awareness, financial literacy, and civic literacy. Embedding these themes into the curriculum enhances students' understanding and relevance of their education to real-world scenarios (Hursen et al., 2023). Learning and innovation skills, often referred to as the "4Cs"—critical thinking, communication, collaboration, and creativity—are essential for navigating and succeeding in an increasingly complex world. Developing these skills through innovative teaching methods and collaborative projects helps students become more adept at problem-solving and critical thinking (Stehle & Peters-Burton, 2019).

Furthermore, life and career skills, including flexibility, adaptability, initiative, self-direction, social and cross-cultural skills, productivity, accountability, leadership, and responsibility, are crucial for success in both careers and personal lives (Sulistyaningsih & Rahmawati, 2019). Proficiency in information, media, and technology skills, which involve accessing, analyzing, evaluating, and creating media in various forms, is essential in the digital age. Students with strong skills in these areas are better equipped to handle the demands of modern workplaces and academic environments, significantly contributing to their overall academic performance and future career success (Del Mundo, 2022).

The academic performance of senior high school learners refers to the extent to which students achieve their educational goals, measured through various assessments, grades, and standardized tests. It is influenced by numerous factors, including students' mastery

of core subjects, learning and innovation skills, life and career skills, and information, media, and technology skills. Research consistently shows that students who excel in these 21st-century skills tend to perform better academically, as these skills enhance their ability to understand and engage with the curriculum effectively (Varona, 2020).

Meanwhile, the Philippine government, through the Department of Education (DepEd), has implemented several initiatives to integrate 21st-century skills into the senior high school curriculum. These efforts include revising curriculum frameworks to emphasize critical thinking, communication, collaboration, and creativity. DepEd has also introduced teacher training programs to equip educators with the necessary skills and knowledge to effectively deliver 21st-century skills instruction. Furthermore, the department has encouraged the use of technology in classrooms and promoted project-based learning to provide students with hands-on experience in applying these skills.

Despite these initiatives, there remains a gap between policy and practice. Many schools still lack adequate resources, such as technology and updated learning materials, to effectively implement 21st-century skills instruction. In addition, teacher training programs may not be sufficient to address the varying levels of teacher expertise and experience. Assessment methods may also need to be revised to accurately measure students' proficiency in these skills. Furthermore, there may be a need for greater collaboration between schools, industry, and the community to ensure that the 21st-century skills taught in schools are relevant to the needs of the workforce and society. Given the ongoing challenges in fully integrating 21st-century skills into the education system and the potential impact these skills have on students' future success, there is a pressing need to investigate the relationship between 21st-century skills and the academic performance of senior high school learners. Understanding this relationship can inform further policy development, curriculum enhancement, and teacher training initiatives to better equip students with the skills they need to thrive in the 21st century.

The 21st-century skills of senior high school learners encompass a range of abilities, including information literacy, flexibility, adaptability, initiative, self-direction, social and cross-cultural skills, productivity, accountability, leadership, critical evaluation, problem-solving, collaborative working, online communication, communication, critical thinking, and problem-solving (O'Sullivan, 2017; Sulistyaningsih, 2019; Rogayan, 2021; Shields, 2018; Carlgren, 2013; Sural, 2017; Kelley, 2019; Santosa, 2022). These skills are crucial for success in the information age and the global economy, and their development is influenced by the education system, the complexity of the skills, and the competence of teachers (Carlgren, 2013). The development of a 21st-century skills instrument for high school students can serve as a baseline and achievement measure for these skills (Kelley, 2019).

A study by Kocaman (2022) focused on analyzing the 21st-century skills of secondary school students concerning gender, grade level, educational status of parents, and Internet variables (Kocaman, 2022). The research employed a survey method to collect data from 421 secondary school students in the Salihli district of Manisa province during the 2021-2022 academic year (Kocaman, 2022). The findings highlighted the importance of understanding how factors such as gender, grade level, and parental education status could impact students' acquisition of 21st-century skills, which is relevant when assessing the 21st-century skills of senior high school learners in Alicia District, Bohol (Kocaman, 2022).

Furthermore, a study by Perdana et al. (2021) explored elementary students' attitudes towards STEM and 21st-century skills, revealing moderate scores in science, mathematics, technology/engineering, and 21st-century skill domains (Perdana et al., 2021). This research emphasized the significance of considering students' perceptions and attitudes towards different domains of 21st-century skills, which could be valuable when evaluating the 21st-century skills of senior high school learners in Alicia District, Bohol (Perdana et al., 2021). Moreover, Shafie et al. (2019) delved into Technological Pedagogical Content Knowledge (TPACK) in teaching 21st-century skills, highlighting the alignment of TPACK with 21st-century skills (Shafie et al., 2019). This study provided insights into how teachers' pedagogical approaches may influence students' acquisition of 21st-century skills, which is essential when evaluating the level of 21st-century skills among senior high school learners (Shafie et al., 2019).

Moreover, Hu (2023) conducted a multidimensional meta-analysis on programming and 21st-century skill development in K-12 schools, identifying best practices to enhance students' 21st-century skills through programming education (Hu, 2023). The research recommended thoughtful design of programming education to maximize its benefits in various dimensions of 21st-century skills (Hu, 2023). These insights could be valuable when considering strategies to improve students' 21st-century skills, which is pertinent to evaluating the 21st-century skills of senior high school learners in Alicia District, Bohol (Hu, 2023).

Despite the extensive research and initiatives aimed at fostering 21st-century skills, there remains a significant gap in understanding the direct relationship between these skills and academic performance in the context of senior high school learners in the Philippines, particularly in the Alicia District, Bohol. Current studies often focus on generalized educational environments or specific regions, leaving a void in localized data that can inform targeted interventions. Additionally, there is limited exploration into how specific factors such as gender, parental education status, and access to technology influence the acquisition and impact of 21st-century skills. Addressing these gaps through comprehensive, localized studies will provide valuable insights for policymakers, educators, and stakeholders, facilitating the development of more effective educational strategies and resources tailored to the needs of senior high school learners in Alicia District, Bohol, thereby contributing to the broader discourse on educational improvement and student preparedness for future challenges.

### **Research Questions**

This study determined the level of 21st century skills and academic performance of Senior high school learners in Alicia District, Bohol for the school year 2018-2019. Specifically, it sought to answer the following aspects of the problem:

- 1. What is the level of 21st century skills of the respondents in terms of:
  - 1.1. core subjects and 21st-century themes;
  - 1.2. learning and innovation skills;
  - 1.3. life and career skills; and
  - 1.4. information, media and technology skills?
- 2. What is the academic performance of the respondents?
- 3. Is there a significant correlation between the respondents' 21st century skills and academic performance?

### Methodology

#### **Research Design**

This study employed a descriptive correlational design to explore relationships between variables. This design was chosen because it allows for the identification and description of the degree of relationship between students' acquisition of 21st-century skills and their academic performance, without manipulating any variables (Aggarwal, 2019).

#### Respondents

Conducted in Alicia district of Bohol, the study involved 205 senior high school learners from Alicia Technical Vocational High School, Cayacay High School, Katipunan High School, and La Hacienda High School. These schools, managed by the Department of Education Bohol Province, offer both Academic and Technical-Vocational Livelihood Tracks.

#### Instruments

A modified questionnaire, based on Jason Ravitz's tool for measuring 21st-century teaching and learning, assessed students' acquisition of 21st-century skills through 48 questions rated on a four-point Likert scale. The questionnaire underwent pilot testing with a similar group of students, and Cronbach's alpha analysis was performed to ensure reliability, yielding a coefficient of 0.89, indicating high reliability (Kiliç, 2016). Data were collected by distributing questionnaires and obtaining academic performance records from school officials.

#### Data Analysis

Data were analyzed using simple percentages to interpret students' academic performance, categorized by a scale ranging from Outstanding to Did Not Meet Expectations based on DepEd Order No. 8, s. 2015. Pearson's correlation was used to determine the relationships between the level of 21st-century skills and academic performance.

#### **Ethical Considerations**

The study followed strict ethical procedures, including obtaining approval from the Research Ethics Committee and securing informed consent from all respondents and their parents. Participation was voluntary, and confidentiality and anonymity were maintained throughout the study.

#### **Results and Discussion**

#### Level of 21st Century Skills

Table 1.1	Level of 21st-	century Skills in	n terms of Core	Subjects and	21st-century themes
		2			2

	Item	WM	DV	
1.	I study information about other countries or cultures.	2.50	MS	
2.	I use ideas that come from people in other countries or cultures.	2.52	MS	
3.	I discuss issues related to global interdependency (like global environment trends and global economy).	2.55	MS	
4.	I understand the life experiences of people from other cultures.	2.85	MS	
5.	I study the geography of distant countries.	2.22	SS	
6.	I reflect on how my experiences and local issues are connected to global issues.	2.43	SS	
7.	I research on topics or issues relevant to my family or community.	2.56	MS	
8.	I apply my learning to local situations, issues or problems.	2.63	MS	
9.	I talk to one or more members of the community about our class project or activity.	2.71	MS	
10.	I analyze how different stakeholder groups or community members view an issue.	2.34	SS	
11.	I respond to a question or task in a way that weighs the concerns of different community members or groups.	2.49	SS	
	Composite Mean	2.53	MS	
Legend	egend: 3.25 – 4.00 Always/Skilled; 2.50 – 3.24 Often/Moderately Skilled; 1.75 – 2.49 Sometimes/ Slightly Skilled; 1.00 – 1.74 Never/ Not Skilled			

Core Subjects and 21st century themes. Table 1.1 presents the level of 21st-century skills among respondents in terms of core subjects and 21st-century themes. The composite mean of 2.53 indicates that, on average, the respondents are Moderately Skilled (MS) in these areas. The highest-rated items, with means ranging from 2.85 to 2.50, suggest that respondents are moderately skilled in understanding the life experiences of people from other cultures, applying learning to local situations, and engaging with community members. However, the lowest-rated items, with means ranging from 2.22 to 2.49, indicate that respondents are only slightly skilled in studying the geography of distant countries, analyzing stakeholder perspectives, and connecting local issues to global concerns. This data highlights the need for further development of 21st-century skills, particularly in areas related to global awareness and community engagement.

The result shows that respondents are moderately skilled in core subjects and 21st-century themes, with strengths in understanding cultural experiences, local applications of learning, and community engagement. However, they are less skilled in global geography, stakeholder analysis, and connecting local to global issues, indicating a need for targeted skill development. Research highlights the importance of critical thinking, problem-solving, communication, collaboration, and digital literacy for enhancing these skills. Integrating these components into education through curriculum reforms and fostering lifelong learning is essential to better prepare individuals for contemporary challenges and the global landscape (Wrahatnolo & Munoto, 2018; Belyaeva et al., 2022; Mawas & Muntean, 2018).

Learning and Innovation Skills. The highest rated item in Table 1.2, reflecting the level of 21st-century skills in terms of learning and innovation skills, is "I summarize or create my own interpretation of what I have read or been taught" with a weighted mean (WM) of 2.89, closely followed by "I analyze competing arguments, perspectives, or solutions to a problem" with a WM of 2.88. These findings suggest that respondents feel moderately skilled in synthesizing and evaluating information from various sources, indicating a reasonable proficiency in critical thinking and interpretative abilities. Conversely, the least rated item is "I invent a solution to a complex, open-ended question or problem" with a WM of 2.54, suggesting that respondents find it challenging to generate innovative solutions independently.

Table 1.2. Level of 21st-century Skills in terms of Learning and Innovation Skills

	Item	WM	DV
1.	I compare information from different sources before completing a task or assignment.	2.76	MS
2.	I draw my own conclusions based on analysis of numbers, facts, or relevant information.	2.74	MS
3.	I summarize or create my own interpretation of what I have read or been taught.	2.89	MS
4.	I analyze competing arguments, perspectives, or solutions to a problem.	2.88	MS
5.	I develop a persuasive argument based on supporting evidence or reasoning.	2.68	MS
6.	I try to solve complex problems or answer questions that have no single correct solution or answer.	2.62	MS
7.	I use idea creation techniques such as brainstorming or concept mapping.	2.86	MS
8.	I generate my own ideas about how to confront a problem or question.	2.82	MS
9.	I test out different ideas and work to improve them.	2.81	MS
10.	I invent a solution to a complex, open-ended question or problem.	2.54	MS
11.	I create an original product or performance to express my ideas.	2.77	MS
	Composite Mean	2.76	MS

Legend: 3.25 – 4.00 Always/Skilled; 2.50 – 3.24 Often/Moderately Skilled; 1.75 – 2.49 Sometimes/ Slightly Skilled; 1.00 – 1.74 Never/ Not Skilled

Interestingly, several studies emphasize the need to enhance creative problem-solving skills in students (Sharma, 2022; Adeoye, 2023; Ramdani, 2021; Titikusumawati, 2019; Fahmi, 2023; Meitiyani, 2022; Kholil, 2020; Karunarathne, 2023). While critical thinking is often fostered, creativity and original problem-solving abilities remain underdeveloped (Sharma, 2022). Innovative teaching strategies, such as real-world problems and clear instructions (Sharma, 2022), along with models like CPS (Adeoye, 2023), PBL, and PJBL (Fahmi, 2023) can address this. Open-ended learning environments, such as open inquiry classes, significantly improve creative thinking (Ramdani, 2021; Kholil, 2020). However, deficits in assessing creative thinking skills in higher education persist (Karunarathne, 2023).

Life and Career Skills. Table 1.3 presents the self-assessment of respondents on various aspects of life and career skills. egarding initiative and problem-solving, the item "I take initiative when confronted with a difficult problem or question" has a weighted mean (WM) of 2.81, classified as Moderately Skilled (MS). This indicates that respondents often take initiative when faced with challenges. Similarly, self-directed learning skills, such as choosing topics or resources (Items 2 and 4), have WMs of 2.70 and 2.80, respectively, both categorized as MS. These results suggest that respondents frequently engage in self-directed learning, though there is still room for improvement.

In terms of task planning and monitoring, planning steps to accomplish tasks (Item 3) has one of the higher WMs at 2.99 (MS), showing frequent engagement in task planning. However, monitoring progress (Item 5) has a lower WM of 2.69 (MS), indicating less frequent self-monitoring among respondents. Assessment and feedback utilization skills, such as using criteria to assess work (Item 6) and incorporating feedback (Items 7 and 12), have WMs of 2.73, 2.75, and 2.90, respectively, all indicating moderate skills. These responses highlight a moderate level of competence in using feedback and assessment.

Collaboration and group work skills are notable, with items related to collaboration (Items 8, 9, and 11) showing WMs of 2.95, 2.97,

Table 1.3 Level of 21st-century Skills in terms of Life and Career Skills

	Item	WM	DV
1.	I take initiative when confronted with a difficult problem or question.	2.81	MS
2.	I choose my own topics of learning or questions to pursue.	2.70	MS
3.	I plan the steps I will take to accomplish a complex task.	2.99	MS
4.	I choose for myself what examples to study or resources to use.	2.80	MS
5.	I monitor my own progress towards completion of a complex task and modify my work accordingly.	2.69	MS
6.	I use specific criteria to assess the quality of my work before it is completed.	2.73	MS
7.	I use peer, teacher or expert feedback to revise their work.	2.75	MS
8.	I work in pairs or small groups to complete a task together.	2.95	MS
9.	I work with other students to set goals and create a plan for our team.	2.97	MS
10.	I create joint products using contributions from other student.	2.69	MS
11.	I present my group work to the class, teacher or others.	3.06	MS
12.	I work in a team to incorporate feedback on group tasks or products.	2.90	MS
13.	I give feedback to peers or assess other students' work.	2.72	MS
	Composite Mean	2.83	MS

Legend: 3.25 – 4.00 Always/Skilled; 2.50 – 3.24 Often/Moderately Skilled; 1.75 – 2.49 Sometimes/ Slightly Skilled; 1.00 – 1.74 Never/ Not Skilled

A recent study supports these findings by examining the 2018 Life Studies curriculum in Turkey, which aimed to develop critical thinking, problem-solving, and collaboration among students. The study found a harmonious relationship between the curriculum and activities in textbooks designed to enhance these 21st-century skills. It highlighted the curriculum's focus on flexibility, adaptability, and productivity, which align well with the skills assessed in this analysis (Kiyikci & Özyurt, 2023).

Information, Media, and Technology Skills. The table presents the self-assessment of respondents on various aspects of information, media, and technology skills, evaluated using a weighted mean (WM) and corresponding descriptive value (DV).

Table 1.4. Level of 21st-century Skills in terms of Information, Media and Technology Skills

	Item	WM	DV
1.	I structure data for use in written products or oral presentations (e.g., creating charts, tables or graphs).	2.51	MS
2.	I convey my ideas using media other than a written paper (e.g., posters, video, blogs, etc.).	2.54	MS
3.	I prepare and deliver an oral presentation to the teacher or others.	2.58	MS
4.	I answer questions in front of an audience.	2.52	MS
5.	I decide how I will present my work or demonstrate my learning.	2.69	MS
6.	I use technology or the Internet for self-instruction (e.g., Kahn Academy or other videos, tutorials, self-	2.84	MS
	instructional websites, etc.).		
7.	I select appropriate technology tools or resources for completing a task.	3.01	MS
8.	I evaluate the credibility and relevance of online resources.	2.88	MS
9.	I use technology to analyze information (e.g., databases, spreadsheets, graphic programs, etc.).	2.86	MS
10.	I use technology to help me share information (e.g., multi-media presentations using sound or video,	2.98	MS
	presentation software, blogs, podcasts, etc.).		
11.	I use technology to support teamwork or collaboration (e.g., shared workspaces, email exchanges, giving and	2.85	MS
	receiving feedback, etc.).		
12.	I use technology to interact directly with experts or members of local/global communities.	2.70	MS
13.	I use technology to keep track of my work on extended tasks or assignments.	2.81	MS
	Composite Mean	2.75	MS

Legend: 3.25 – 4.00 Always/Skilled; 2.50 – 3.24 Often/Moderately Skilled; 1.75 – 2.49 Sometimes/ Slightly Skilled; 1.00 – 1.74 Never/ Not Skilled

Overall, respondents demonstrated moderate proficiency in these skills, with a composite mean of 2.75. Specifically, data structuring for presentations and using diverse media for communication had WMs of 2.51 and 2.54, respectively, indicating moderate skill levels. Public speaking and audience interaction also showed moderate proficiency, with a WM of 2.52. Respondents frequently used technology for self-instruction (WM 2.84) and were proficient in selecting appropriate technology tools and evaluating online resources, with WMs of 3.01 and 2.88, respectively. Skills in analyzing and sharing information using technology were also moderate, with WMs of 2.86 and 2.98. Additionally, respondents showed moderate skill in using technology for teamwork (WM 2.85) and interacting with experts (WM 2.70), as well as in managing tasks (WM 2.81). A recent study by Sulistyaningsih and Rahmawati (2019) supports these findings, highlighting the importance of integrating 21st-century skills into educational curricula to enhance critical thinking, problem-solving, and technology use among students. This study emphasizes the need to prepare students with the necessary skills to navigate the complexities of modern information and technology landscapes (Sulistyaningsih & Rahmawati, 2019).

21ST Century Skills (Overall). The dimension of Core Subjects and 21st-century themes has a composite mean of 2.53, indicating that respondents are moderately skilled in integrating core subjects with contemporary themes. Learning and Innovation Skills are also rated as moderate, with a composite mean of 2.76, suggesting that respondents frequently engage in creative and critical thinking, as

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well as collaborative problem-solving.

Table 1.5 Summary Table for Level of 21st Century Skills						
Dimension	Composite Mean	Interpretation				
Core Subjects and 21st century themes	2.53	Moderate				
Learning and Innovation Skills	2.76	Moderate				
Life and Career Skills	2.83	Moderate				
Information Madia and Technology skills	2 75	Moderate				

Over-all Mean

Life and Career Skills have the highest composite mean at 2.83, indicating a slightly higher proficiency in skills such as initiative, planning, and teamwork, though still within the moderate range. Information, Media, and Technology Skills are assessed with a composite mean of 2.75, reflecting moderate competence in using technology and media effectively for learning and communication. The overall mean score for all dimensions is 2.72, reinforcing the conclusion that respondents generally possess moderate proficiency across all evaluated 21st-century skills.

2.72

Moderate

These findings are supported by a recent study which emphasized the importance of integrating 21st-century skills into educational curricula to enhance critical thinking, problem-solving, and technology use among students. The study concluded that while these skills are essential, their effective assessment and development require ongoing efforts and improvements in educational practices (Kiyikci & Özyurt, 2023).

#### **Academic Performance of the Respondents**

Table 2 presents the academic performance data for senior high school students from the district of Alicia.

Table 2. Academic Performance of the Respondents						
Description	Range	F	%	Rank		
Outstanding (O)	90 - 100	61	29.76	2		
Very Satisfactory (VS)	85 - 89	73	35.61	1		
Satisfactory (S)	80 - 84	56	27.32	3		
Fairly Satisfactory (FS)	75 - 79	15	7.317	4		
Did Not Meet Expectations (DNME)	below 75	0	0	5		
Total		205	100			
Mean = 86.46		Ver	y Satisfa	ctory		
Above the Mean		106	51.71	1		
Below the Mean		99	48.29	2		

Table 2 reveals that the majority of students (35.61%) achieved a Very Satisfactory rating, followed by 29.76% with an Outstanding rating, and 27.32% with a Satisfactory rating. The mean score of 86.46 indicates an overall Very Satisfactory performance, with 51.71% of students scoring above the mean and 48.29% below. Notably, no students fell into the Did Not Meet Expectations category, suggesting that all students met the minimum academic requirements.

Interestingly, the academic performance data of senior high school students from the district of Alicia, where the majority achieved a Very Satisfactory rating, aligns with findings from multiple studies in the Philippines between 2018 and 2024. For instance, Padernal and Diego (2020) found that students' understanding of Algebra and Trigonometry significantly impacted their performance in Pre-Calculus. Alipio (2020) highlighted that student from STEM strands exhibited higher academic adjustment and performance levels. Casildo et al. (2022) developed a predictive model showing a strong correlation between previous academic performance and National Achievement Test results. Also, Quijano et al. (2023) indicated that parental involvement did not significantly affect academic performance, suggesting other influential factors. These studies collectively support the high academic achievement observed in Alicia.

#### **Correlation between 21st Century Skills and Academic Performance**

As shown in Table 1, the Pearson correlation coefficient (r) between academic performance and 21st-century skills is 0.2245. This indicates a positive but weak correlation between the two variables. The p-value associated with this correlation is less than 0.05 (p < 0.05), suggesting that the correlation is statistically significant at the 0.05 level of significance. Therefore, the null hypothesis (H0), which states that there is no significant correlation between 21st-century skills and academic performance, is rejected.

Variables	r	p-value	Result	Decision on $H_0$
Academic Performance and	0.2485	< 0.05	Significant	Reject
21st Century Skills			-	

The result implies that as students' proficiency in 21st-century skills increases, their academic performance tends to improve, though the strength of this relationship is relatively modest. Recent studies have explored the correlation between 21st-century skills and academic performance with varying conclusions. A study by Princess Varona (2020) indicated that among high school students, only communication skills showed a significant relationship with academic performance, while other skills like critical thinking, collaboration, and creativity did not demonstrate substantial correlations. Conversely, a 2023 study by M. Bircan and Emrah Akman

found a significant relationship between 21st-century skills, particularly critical thinking, problem-solving, and information technology literacy, and academic performance in science and mathematics courses. This study highlighted that these skills could predict academic success in these subjects (Bircan & Akman, 2023). Overall, while communication skills consistently correlate with academic performance, other 21st-century skills show varying levels of impact depending on the context and subjects.

## Conclusions

The findings of this study have significant implications for educational practices and policies in the Alicia District of Bohol and the entire DepEd Philippines. The moderate proficiency levels in 21st-century skills among senior high school learners and the weak but statistically significant positive correlation between these skills and academic performance emphasize the need for educators and policymakers to prioritize integrating 21st-century skills into the curriculum and instructional practices. By providing opportunities to develop critical thinking, problem-solving, creativity, collaboration, and technology literacy and by investing in continuous professional development for teachers, schools can better prepare students for the challenges and demands of the rapidly evolving global landscape. Moreover, collaboration among educational institutions, businesses, and community organizations is crucial for providing authentic learning experiences that foster 21st-century skills and promote real-world problem-solving, ultimately contributing to students' academic success and overall well-being as they navigate the complexities of the 21st century.

Teachers should integrate critical thinking, problem-solving, creativity, collaboration, and technology literacy into their teaching practices and curriculum design. This can be achieved through project-based learning, inquiry-based approaches, and real-world problem-solving activities.

Schools should invest in continuous professional development programs that equip teachers with the knowledge and strategies to effectively teach and assess 21st-century skills. This can include workshops, seminars, and mentoring programs that focus on innovative teaching methods and the integration of technology in the classroom.

Schools in Alicia District should create a culture that values and nurtures 21st-century skills by providing resources, infrastructure, and opportunities for students to engage in collaborative projects, community service, and global learning experiences. This can include establishing partnerships with local businesses, organizations, and educational institutions to provide authentic learning opportunities for students.

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