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Teacher's 21st Century Skills and Pupil's Learning Outcome: Basis for Training Program

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Abstract: The primary focus of this study is to determine the level of teacher's 21st-century skills and how it affects the pupil's performance. The study conducted at the different schools of Mercedes District, Zamboanga City Division. The respondents of this research are the grades 4,5 and 6 teachers. It employed a descriptive quantitative with correlation design. The findings indicate that teachers' proficiency in 21st-century skills significantly enhances pupils' learning outcomes. Emphasizing ongoing professional development in these areas is crucial for sustaining and improving educational quality. The study underscores the importance of equipping teachers with the necessary skills to effectively integrate technology, media, and flexible teaching approaches to foster better academic performance and engagement among students. To enhance teachers' 21st-century skills and improve pupils' learning infrastructure and promote a collaborative and adaptable teaching environment. Schools should provide ongoing training tailored to teachers' needs, ensure access to up-to-date digital resources, and leverage the experience of seasoned educators to mentor their peers. Regular assessments and responsive curriculum design are also crucial for continuous improvement.

Index Terms **- 21st century, Learning Outcomes, Technology Proficiency, Media Literacy, Communication, Adaptability and Flexibility**

I. INTRODUCTION

In the ever-evolving landscape of education, the integration of technology has emerged as a pivotal factor influencing student learning outcomes (Smith, 2020). Educators now find themselves at the intersection of tradition and innovation, tasked with leveraging digital resources to enhance learning. Effective technology integration transcends the mere addition of devices to classrooms; it is a holistic approach that seamlessly blends pedagogy, content, and technology (Jones & Brown, 2019).

A fundamental shift is required for educators to grasp technology integration fully. Learning with technology surpasses the notion of merely learning about it (Garcia et al., 2021). This shift emphasizes the importance of knowing when and how to use technology effectively, embedding it deeply into the educational process. Continuous professional development through workshops, collaborative projects, and training programs is essential for teachers to keep pace with the rapidly changing technological landscape (White & Lee, 2018).

Educators must adapt their teaching strategies to align technology with subject-specific approaches (Clark & Green, 2020). There is no universal method; instead, teachers must tailor their approaches to ensure technology enhances learning opportunities. The Enhanced Basic Education Act underscores the importance of an ICT-based, globally competitive education and the pivotal role of teachers in preparing students for a digital future (Department of Education, 2017). Initiatives like collaborative work and paperless classrooms are essential steps toward this goal.

1.1 Statement of the Problem

This study aims to assess the technology skills and academic performance of high school students, determining whether they are proficient in technology or face challenges for the school year 2023-2024

Specifically, the study aims to address the questions;

1. What is the level of teacher's 21st century in technology in terms of:
   1.1 Technological Proficiency
   1.2 Media Literacy
   1.3 Communication
   1.4 Adaptability and Flexibility
2. What is the pupil's learning?
3. Is there a significant relationship between the level of teacher's 21st century skills and pupil's learning outcome?
4. Is there a significant difference in the teacher's 21st century skills when grouped according to:
   4.1 Trainings attended
   4.2 Number of years in teaching

1.2 Scope and Delimitation of the Study

This study examined teachers' 21st-century skills and pupils' learning outcomes at nine elementary schools in Zamboanga City during the 2023-2024 school year. It focused on teachers' technological proficiency, media literacy, communication, adaptability, and flexibility. The study aimed to determine the levels of these skills and their impact on students' academic performance. Respondent were grade 4, 5 and 6 teachers of Mercedes Central School SPED Center, Culianan Elementary School, Cabaluay Elementary School, Talabaan Elementary School, Taluksangay Elementary School , Lapakan Elementary School, Vida Vista Elementary School, Islamia Elementary School, and Cacao Elementary School.

II. RESEARCH METHODOLOGY

2.1 Research Design

The study utilized a descriptive quantitative research design with correlation to examine the relationships between variables. This approach allowed the researchers to describe the current state of the variables and analyze the degree to which they are related. By employing statistical techniques, the study identified patterns and measured the strength and direction of associations between variables, providing insights into potential causal relationships without manipulating any variables.

Specifically, the study tested the significant relationship between the level of teachers' 21st-century skills and pupils' learning outcomes in selected elementary schools in the division of Zamboanga City. It is descriptive because it described teachers' 21st-century skills in terms of technological proficiency, media literacy, communication, adaptability, and flexibility. According to Padua (2000), descriptive research aims to describe the status of events and the nature of the situation as it exists at the time of the investigation.

2.2 Population and Respondents of the Study

The target population of respondents were the teachers teaching grade 4 to 6 of Elementary School of Public Schools of Zamboanga City Schools Division, School Year 2023-2024. The total population of teacher respondents was 250 across Mercedes District.

2.3 Sampling Design

The study employed the non-probability sampling technique, more precisely the convenience and purposeful non-random sampling. The researcher can compile respondents based on a category (teachers from schools under Zamboanga City Division) by using purposeful sampling. Convenience sampling, on the other hand, enables the researcher to select participants who were present during data collection as long as they meet the requirements to complete the questionnaire, can be reached online, or can be reached in person. In all, 101 educators who fit the researcher's predetermined requirements will take part in the study as respondents. Most researchers believe that a sample size of between thirty and five hundred, with a confidence level of five percent, is sufficient (Altunışık et al., 2004).

2.4 Research Instrument

A self-made questionnaire-checklist was used as the instrument for gathering data with regard to the availability and extend of implementation of teachers 21st century skills and pupils learning outcome of elementary school pupils in the select public schools in Zamboanga City division during school year 2023-2024.

2.5 Validity and Reliability of the Research Instrument

The researcher-made instrument was validated by research experts and underwent pilot testing on 15 teachers from Mercedes District, who shared the same characteristics as the target respondents for the study. Consequently, the instrument exhibited a reliability coefficient of 0.943 at Cronbach Alpha

III. RESULTS AND DISCUSSIONS

Problem 1: What is the level of teacher's 21st century skills in terms of Technological Proficiency, Media Literacy, Communication and Adaptability and Flexibility.

Table 1: Level of 21st Teacher's 21st century skills among Teacher-respondents in terms of Technological Proficiency

Statements *The teacher...*	**Mean**	**Verbal Description**	**Interpretation**
1. uses technology in her teaching practices	3.42	Strongly Agree	Highly Proficient
2. uses multimedia presentations to deliver engaging lessons	3.41	Strongly Agree	Highly Proficient
3. adapts instructional methods to effectively integrate new technologies. adapts instructional methods to effectively integrate new technologies.	3.41	Strongly Agree	Highly Proficient
4. demonstrates proficiency in utilizing technology for instructional purposes.	3.44	Strongly Agree	Highly Proficient

5. encourages students to explore digital tools for learning.	3.37	Strongly Agree	Highly Proficient
Over-all Mean	**3.41**	**Strongly Agree**	**Highly Proficient**

Legend: 3.25-4.00 Strongly Agree (SA) – Highly Proficient; 2.50-3.24 Agree (A) -Moderately Proficient; 1.75-2.49 Disagree (D) – Fairly Proficient; 1.00-1.74 Strongly Disagree (SD)- Not Proficient

Table 1 shows that the educators prioritize their proficiency in utilizing technology for instructional purposes, as evidenced by the highest mean score of 3.44, interpreted as "highly proficient." This is closely followed by a mean score of 3.37 for encouraging students to explore digital tools for learning. These findings underscore the critical role of technology in enhancing instructional effectiveness and student learning outcomes. However, while encouraging students to explore digital tools is highly valued, it receives relatively less emphasis compared to other aspects measured in the survey. This implies that although educators recognize the importance of digital literacy, they may prioritize other areas where they feel more confident and proficient.

Mishra and Koehler's (2006) concept of Technological Pedagogical Content Knowledge (TPACK), which highlights the need for teachers to integrate technology effectively into their instructional practices. In the classroom, this may manifest as a structured use of technology rather than encouraging independent exploration. To bridge this gap, further professional development may be needed to support educators in fostering more student-driven use of digital tools, ultimately enhancing students' digital literacy and autonomous learning skills.

Table 2: Level of 21st Teacher's 21st century skills among Teacher-respondents in terms of Media Literacy

Statements ***The teacher…***	**Mean**	**Verbal Description**	**Interpretation**
1. incorporates media literacy concepts into your teaching	3.47	Strongly Agree	Highly Proficient
2. encourages students to critically analyze media messages.	3.41	Strongly Agree	Highly Proficient
3. assess pupils understanding of media literacy concepts.	3.43	Strongly Agree	Highly Proficient
4. encourages students to critically analyze media messages.	3.47	Strongly Agree	Highly Proficient
5. helps students distinguish between fact and opinion in media content.	3.50	Strongly Agree	Highly Proficient
Over-all Mean	**3.46**	**Strongly Agree**	**Highly Proficient**

Table 2 shows that the educators' strong emphasis on media literacy education, with the highest mean score of 3.50 associated with helping students distinguish between fact and opinion in media content. This underscores the significance educators place on developing students' critical thinking skills, essential for navigating media content effectively. Additionally, statements encouraging critical analysis of media messages and integrating media literacy concepts into teaching received mean scores of 3.47, indicating their importance in educators' priorities. However, while critical analysis of media messages is still valued and proficiently practiced, it receives relatively less emphasis compared to other aspects measured. This suggests a potential area for growth, emphasizing the need to further integrate critical media analysis into the curriculum to enhance students' ability to navigate and interpret media content critically.

Hobbs' (2009) research, which similarly emphasized educators' valuation of media literacy skills in distinguishing between fact and opinion. In the classroom, this emphasis on media literacy may be observed through students' increased ability to engage in informed discussions and critically analyze media sources and content, reflecting the integration of these skills into their broader educational experience.

Table 3: Level of 21st Teacher's 21st century skills among Teacher-respondents in terms of Communication

Statements ***The teacher…***	**Mean**	**Verbal Description**	**Interpretation**
1. encourages peer-to-peer communication and collaboration	3.62	Strongly Agree	Highly Proficient
2. communicates expectations for behavior and participation clearly.	3.53	Strongly Agree	Highly Proficient
3. adapts communication style to suit the needs of different students.	3.59	Strongly Agree	Highly Proficient
4. fosters an environment where students feel comfortable expressing themselves.	3.51	Strongly Agree	Highly Proficient
5. provides constructive feedback to students on their work.	3.47	Strongly Agree	Highly Proficient
Over-all Mean	**3.54**	**Strongly Agree**	**Highly Proficient**

Table 3 shows that the educators' strong emphasis on fostering collaborative environments, with the highest mean of 3.62 associated with encouraging peer-to-peer communication and collaboration. This underscores educators' recognition of the value in creating opportunities for students to interact and learn from one another, enhancing understanding and retention of material.

Additionally, adapting communication styles to suit diverse student needs, with a mean of 3.59, reflects educators' commitment to inclusivity and ensuring effective engagement with content. However, while providing constructive feedback to students on their work is proficiently executed, with a mean of 3.47, there is room for enhancement or emphasis on this aspect of teaching practice. This suggests an opportunity for educators to reflect on and refine their feedback practices to ensure they are meaningful and tailored to individual student needs, ultimately optimizing their impact on student learning and achievement.

Slavin's (1995) research supports educators' emphasis on peer-to-peer communication and collaboration, highlighting the benefits of these strategies in enhancing student understanding and developing important social and communication skills. This underscores the significance of peer collaboration and communication skills in educational practices, informing educators' approaches to fostering collaborative learning environments.

Table 4: Level of 21st Teacher's 21st century skills among Teacher-respondents in terms of Adaptability and Flexibility

Statements ***The teacher…***	**Mean**	**Verbal Description**	**Interpretation**
1. embraces new teaching methods and technologies	3.48	Strongly Agree	Highly Proficient
2. seeks feedback from students or colleagues to improve teaching practices	3.40	Strongly Agree	Highly Proficient
3. handles unexpected challenges or disruptions in your teaching environment	3.42	Strongly Agree	Highly Proficient
4. adjusts teaching strategies to accommodate diverse student needs.	3.47	Strongly Agree	Highly Proficient
5. demonstrates flexibility in responding to unexpected changes in the learning environment	3.48	Strongly Agree	Highly Proficient
Over-all Mean	**3.45**	**Strongly Agree**	**Highly Proficient**

Table 4 shows that the educators prioritize adaptability, with the highest mean score of 3.48 for demonstrating flexibility in responding to unexpected changes and embracing new teaching methods and technologies. This indicates a commitment to staying current and catering to diverse student needs. Similarly, adjusting teaching strategies to accommodate student diversity receives a mean score of 3.47. However, managing unexpected challenges in the teaching environment, with a mean of 3.42, suggests there's room for improvement in this aspect of teaching practice. While educators generally handle disruptions proficiently, there may be occasional difficulties or opportunities for further refinement.

Tschannen-Moran and Hoy's (2001) study on teacher efficacy underscores the importance of supporting educators in developing adaptability, which can empower them to respond effectively to unforeseen circumstances. This highlights the ongoing relevance of teacher efficacy in educational settings.

Table 5: Summary of Teacher's 21st century skills

Indicators	**Mean**	**Interpretation**
Technology Proficiency	3.41	Highly Proficient
Media Literacy	3.46	Highly Proficient
Communication	3.54	Highly Proficient
Adaptability and Flexibility	3.45	Highly Proficient
Over-All Mean	**3.47**	**Highly Proficient**

Legend: 3.25-4.00 Highly Proficient; 2.50-3.24 Moderately Proficient;
1.75-2.49 Fairly Proficient; 1.00-1.74 Not Proficient

Table 5 summarizes teachers' proficiency in 21st-century skills and its impact on pupils' learning outcomes. Notably, educators excel in communication skills, crucial for effective teaching and learning interactions. This proficiency enables them to convey information clearly, engage students meaningfully, and facilitate discussions. In the classroom, this translates into clear explanations, engaging discussions, and constructive feedback sessions. Rowe's (2000) study on wait time underscores the importance of clear communication and allowing students sufficient time to respond, leading to more thoughtful interactions. Effective communication skills create a supportive learning environment where students feel heard and motivated to participate actively, ultimately enhancing their learning experiences and outcomes.

Problem 2: What is the Pupil's Learning Outcome.

Table 6: Pupil's Learning Outcome for 3rd Quarter, School Year 2023-2024

Indicator	Mean	Verbal Description
General Weighted Average Grade	87.90	Very Satisfactory

Legend: 90-100 (Outstanding); 85-89 (Very Satisfactory); 80-84 (Satisfactory); 75-79 (Fairly Satisfactory); Below 75 (Did Not Meet Expectations)

Table 6 shows that the students' academic performance in the third quarter of the 2023-2024 school year, indicating a mean score of 87.90, categorized as "very satisfactory." This suggests that students performed well academically, demonstrating a solid understanding of the curriculum content and meeting or exceeding expected learning outcomes. The high mean score reflects effective teaching strategies and active student engagement, contributing to a positive learning environment. Frąckowiak and Mazur's (2018) research on teacher communication style and student academic achievement in mathematics supports this, highlighting the importance of clear and engaging communication in enhancing student learning outcomes. Effective communication by educators fosters better understanding and mastery of academic concepts, underscoring its significance in educational practice.

Problem 3: Is there a significant relationship between the level of Teacher's 21st century skills and pupil's learning outcomes.

Table 7: Relationship between the level of Teacher's 21st century skills and pupil's learning outcomes

Variable		R-value	P-value	Interpretation
X	**Y**			
Level of teacher's 21st century skills	Pupil's learning outcomes	.053	.599	Not Significant

Table 7 shows that the analysis shows that there is no significant relationship between Teachers' 21st-century skills and Pupils' learning outcomes, with an R-value of 0.053 and a P-value of 0.599. This means that the level of Teachers' 21st-century skills has minimal impact on Pupils' learning outcomes. Other factors likely play a more substantial role in influencing academic performance. Therefore, the relationship between Teachers' 21st-century skills and Pupils' learning outcomes is not significant in this context.

Fisher, Frey, and Gonzalez (2018) discuss "visible thinking" in their book, advocating for making student thinking processes clear. While not directly about teacher communication, the framework underscores the importance of fostering critical thinking, which can enhance student learning outcomes. It highlights the value of creating an environment where students' thinking is visible, aiding teachers in understanding and supporting their cognitive development. This approach suggests that when teachers prioritize making student thinking visible, it can improve students' ability to engage critically with content, leading to better learning outcomes. Overall, Fisher et al.'s work emphasizes the importance of deliberate teaching methods that promote critical thinking and their role in fostering student success.

Problem 4: Is there a significant difference in the level of teacher's 21st century skills when group according to number of relevant trainings and number of years in teaching

Table 8: Teacher's 21st Century Skills when group According to Number of Relevant Training

Variable	Number of Relevant Trainings	Mean	f-value	p-value	Interpretation
Teacher's 21st Century Skills and Number of Relevant Trainings	3 and below	3.35	8.301	.000	Significant
	4 to 7	3.56			
	8 and above	3.39			

Table 8 shows a significant difference in teachers' 21st-century skills based on their participation in relevant trainings. The mean scores vary notably among respondents who attended different numbers of trainings: 3 and below (mean score of 3.35), 4 to 7 (mean score of 3.56), and 8 and above (mean score of 3.39). With an F-statistic of 8.301 and a p-value of .000, this difference is statistically significant, leading to the rejection of the null hypothesis. It means that the number of relevant trainings significantly influences teachers' proficiency in 21st-century skills. Educators with more training sessions tend to demonstrate higher levels of proficiency. Therefore, investing in professional development can enhance teachers' abilities to integrate 21st-century skills into their teaching, benefiting student learning outcomes.

Yoon, Duncan, Scarceddo, and Shapley (2007) found that well-designed professional development programs improve teacher skills and positively impact student learning, supporting the findings in Table 8. This highlights the importance of structured professional devel

Legend: 3.25-4.00 Strongly Agree (SA) – Highly Proficient; 2.50-3.24 Agree (A) -Moderately Proficient; 1.75-2.49 Disagree (D) – Fairly Proficient; 1.00-1.74 Strongly Disagree (SD)- Not Proficient

Table 9: Teacher's 21st Century Skills when group according to Number of years in teaching

Variable	Length of Service	Mean	f-value	p-value	Interpretation
Teacher's 21st Century Skills and Number of years in teaching	10 year and below	3.45	8.125	.000	Significant
	11 to 20 years	3.66			
	21 to 30 years	3.40			
	31 year and above	3.26			

Table 9 shows a significant difference in teachers' 21st-century skills based on their length of service. The mean scores are: 10 years and below (3.45), 11 to 20 years (3.66), 21 to 30 years (3.40), and 31 years and above (3.26). With an F-statistic of 8.125 and a p-value of .000, these differences are statistically significant, leading to the rejection of the null hypothesis. This suggests that the length of service significantly impacts teachers' proficiency in 21st-century skills, with mid-career teachers (11 to 20 years) showing the highest proficiency, while those with longer service exhibit slightly lower proficiency. This underscores the need for targeted professional development throughout teachers' careers to enhance their skills.

Hinterman and Ben-Artzi (2018) studied the relationship between teacher expertise and student autonomy. While not directly addressing 21st-century skills, their research highlights how teacher experience influences teaching practices that affect student learning outcomes. This aligns with Table 9's findings, suggesting that teacher experience impacts proficiency in 21st-century skills and emphasizing the importance of considering teacher career stages in professional development to support effective teaching and student empowerment.

Table 10: Teacher's 21st century skills when group according to number of years in teaching

Variable	Length of Service	Mean	f-value	p-value	Interpretation
Teacher's 21st Century Skills and Number of years in teaching	10 year and below	3.45	8.125	.000	Significant
	11 to 20 years	3.66			
	21 to 30 years	3.40			
	31 year and above	3.26			

Table 10 shows a significant difference in teachers' 21st-century skills based on their number of years in teaching, with mean scores of 3.45 for 10 years and below, 3.66 for 11 to 20 years, 3.40 for 21 to 30 years, and 3.26 for 31 years and above. The F-statistic of 8.125 and p-value of .000 indicate these differences are statistically significant, rejecting the null hypothesis that length of service does not affect these skills. This suggests mid-career teachers (11 to 20 years) are most proficient in 21st-century skills, while those with longer tenures show slightly lower proficiency. These findings highlight the need for targeted professional development at different career stages. Hinterman and Ben-Artzi (2018) found that teacher experience influences student autonomy, emphasizing the importance of teacher expertise in shaping learning environments. This aligns with Table 10, suggesting that length of service impacts teachers' proficiency in 21st-century skills, with experienced educators playing a key role in student learning outcomes.

IV. CONLCUSIONS

The analysis of teachers' 21st-century skills reveals significant differences based on their length of service. Mid-career teachers (11 to 20 years) exhibit the highest proficiency, while those with longer tenures show slightly lower levels of proficiency. These findings highlight the influence of experience on the development of these skills. Additionally, other studies, such as those by Hinterman and Ben-Artzi (2018), support the notion that teacher experience significantly shapes teaching practices and student learning outcomes. This underscores the importance of continually developing teachers' skills throughout their careers to ensure they can effectively support student learning in a dynamic educational environment.

V. RECOMMENDATIONS

To address the identified proficiency gaps in 21st-century skills among teachers, it is recommended that targeted professional development programs be implemented. These programs should focus on enhancing the skills of educators at various career stages, with particular attention to mid-career and veteran teachers. By providing ongoing, structured training that emphasizes the integration of technology, media literacy, collaboration, and adaptability, educators can maintain and improve their proficiency in essential 21st-century skills. This approach will not only enhance teachers' instructional effectiveness but also foster better student learning outcomes by ensuring that teaching practices remain current and responsive to the evolving educational landscape.

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Legend: 3.25-4.00 Strongly Agree (SA) – Highly Proficient; 2.50-3.24 Agree (A) -Moderately Proficient;

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