



VISUAL AND AUDITORY DIGITAL INSTRUCTIONS: A SUPPLEMENTARY MATERIAL IN FACILITATING STUDENTS' PROBLEM-SOLVING SKILLS

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ABSTRACT

The main purpose of the study was to determine the effect of utilization of visual and auditory digital instructions in facilitating Students' problem-solving skills. This study examines the level of visual and auditory digital instructions in facilitating students' problem-solving skills in terms of content and elements; the level of students' problem-solving skills; and the effect of content and elements of visual and auditory digital instructions to students' problem-solving skills.

The study employed descriptive research to assess the influence of visual and auditory digital instructions on problem-solving skills. Purposive sampling technique was used to 78 Grade 9 students at Lowland Integrated National High School. Descriptive and inferential statistics, including weighted mean formula, standard deviation to measure both the validity of the instructional methods and the level of students' problem-solving skills, and T-test, were utilized to analyze the gathered data and determine the effect of the instructions on students' problem-solving skills.

The level of visual and auditory digital instructions in terms of content and elements ranged from high to very high among the respondents. In addition, the students demonstrate satisfactory to outstanding problem-solving skills with a multi-structural level of logical reasoning, critical thinking, and analytical skills. And it indicates that the content and element of visual and auditory digital instructions shows a significant effect on students' problem-solving skills. It is implied that the visual and auditory digital instructions have significant effect on the learners' problem-solving skills.

The students showed multi-structural level of problem-solving skills. Also, they exhibited relational level of logical reasoning, relational level of critical thinking and relational level of analytical skill. The findings indicate that the content of visual and auditory digital instructions influenced students' problem-solving skills. Similarly, it indicates that the element of visual and auditory digital instructions influenced students' problem-solving skills. Therefore, facilitating students through visual and auditory digital instructions improves students' problem-solving skills.

With the confirmation of a significant effect of visual and auditory digital instructions on students' problem-solving skills, it is imperative for students, teachers, and future researchers to harness the potential of visual and auditory digital instructions to optimize problem-solving outcomes. As such, educators should adopt a multimodal approach to instruction; learners may engage not only with interactive multimedia components, audiovisual presentations, and simulations but also with visual and auditory digital instructions; and encouraging collaborative research endeavors and partnerships between academia, industry, and technology providers can drive innovation in digital instructional design.

KEYWORDS: utilization; digital instructions; problem-solving skills

1. INTRODUCTION

In today's ever-changing educational world, the search to improve learning outcomes and foster fundamental cognitive skills is a constant undertaking. Among these abilities, problem-solving is a cornerstone of intellectual development, crossing disciplinary borders and finding application in a wide range of academic disciplines. In addition to strengthening cognitive abilities, being able to evaluate, synthesize, and come up with answers to complicated problems gives people a diverse toolkit for handling real-world situations. An area of considerable interest in this endeavor is the use of instructional strategies that maximize the potential of multi-modal learning approaches.

The combination of visual and auditory digital instructions and problem-solving ability allows investigation into multiple dimensions. To determine the genuine effect of this pedagogical technique, the effects on cognitive load,

information retention, and the integration of gained knowledge into actionable solutions must be examined. A thorough assessment of how individual variations, such as learning preferences and past knowledge, interact with visual and auditory digital instructions provides useful insights into adapting instructional tactics for varied student cohorts.

This thesis investigates a powerful educational tool— visual and auditory digital instructions —and its potential to independently boost students' problem-solving skills. This medium has promised as an effective assist in the cognitive processes behind problem-solving by combining aural and visual stimuli. It provides a multidimensional learning experience that resonates with multiple learning styles, addressing both aural and visual learners while concurrently easing the cognitive burden associated with complicated problem-solving activities, through the synchronous display of information.



This thesis digs into a detailed review of relevant literature in the following chapters, navigating the worlds of Cognitive Load Theory (CLT), multimedia learning, and pedagogical practices geared at improving problem-solving skills. Using both quantitative and qualitative techniques, empirical investigations are done to explicate the complicated dynamics between visual and auditory digital instructions and the development of problem-solving skills.

The findings of this study have the potential to not only improve educational methods, but also to add significantly to the theoretical discourse around multimedia learning and instructional design. Furthermore, it is consistent with the larger educational imperative of providing students with not only topic knowledge but also the analytical and problem-solving skills required for success in academic and professional settings.

1.1 Statement of the Problem

Specifically, the study sought to answer the following questions:

1. What is the level of visual and auditory digital instructions in facilitating students’ problem-solving skills in terms of content with regards to:
 - 1.1. Introduction;
 - 1.2. Objectives;
 - 1.3. Interactive Elements;
 - 1.4. Feedback Mechanism; and
 - 1.5. Additional Resources?
2. What is the level of visual and auditory digital instructions in facilitating students’ problem-solving skills in terms of element with regards to:
 - 2.1. Narrative Structure;
 - 2.2. Visual Creativity;
 - 2.3. Sound Design; and
 - 2.4. Time Duration?
3. What is the level of students’ problem-solving skills in terms of;
 - 3.1. Logical Reasoning
 - 3.2. Critical Thinking; and
 - 3.2. Analytical Skill?
4. Is there a significant effect between the content of visual and auditory digital instructions and students’ problem-solving skills?
5. Is there a significant effect between the element of visual and auditory digital instructions and students’ problem-solving skills?

2. METHODOLOGY

The study used descriptive research to determine whether visual and auditory digital instructions affect the problem-solving

skills of learners of grade 9 of Lowland Integrated National High School, S.Y. 2023-2024.

The descriptive study approach was utilized by the researcher to determine the effect of utilizing visual and auditory digital instructions to answer mathematical word problems.

In this study, the descriptive research method was applied. Moring (2014) claims that descriptive studies are used to systematically observe, record, and analyze facts or occurrences without manipulating or altering them, especially when the goal is to gain a deep understanding of a specific phenomenon or group, such as studying a population’s characteristics or the prevalence of certain behaviors.

3. RESULTS AND DISCUSSION

In this chapter, the data analysis and results of this study are presented and discussed in detail. The results were presented according to the following main categories: the level of Visual and Auditory Digital Instructions and Students’ Problem-Solving Skills. The main determining factor of response was the effect of visual and auditory digital instructions on students’ problem-solving skills.

Level of visual and auditory digital instructions in facilitating students’ problem-solving skills in terms of content

In this study visual and auditory digital instructions in facilitating students’ problem-solving skills in terms of content include introduction, objectives, interactive elements, feedback mechanism, and additional resources.

Level of visual and auditory digital instructions in facilitating students’ problem-solving skills in terms of content with regards to introduction

Table 1 shows the level of visual and auditory digital instructions in terms of content with regards to introduction. Also shows the statements, mean, standard deviation and remarks.

The introduction effectively sets the tone and expectations for the rest of the content. The mean (M = 4.48) suggests a very high level in terms of content introduction. Also, it provided context and relevance for why problem-solving skills are important in this context. While the mean is lower (M = 4.00), it still indicates that the teachers agree on the validity of the introduction stated on the material.

Table 1. Level of Visual and Auditory Digital Instructions in terms of Content with regards to Introduction

The introduction ...	MEAN	SD	REMARKS
... effectively captured the attention and piqued the interest in the topic.	4.28	0.79	Strongly Agree
... provided a clear overview of what will be covered in the instructional material.	4.36	0.76	Strongly Agree
... provided context and relevance for why problem-solving skills are important in this context.	4.00	0.91	Agree
...effectively sets the tone and expectations for the rest of the content.	4.48	0.65	Strongly Agree
...included elements (e.g., visuals, audio) that enhanced understanding and engagement.	4.32	0.63	Strongly Agree



Weighted Mean	4.29
SD	0.76
Verbal Interpretation	Very High

Table 1 presents the level of visual and auditory digital instructions in terms of content with regards to introduction attained a weighted mean score ($M = 4.29$, $SD = 0.72$) was verbally interpreted as *very high* among the respondents. To sum up, the content introduction effectively captured the attention, provided a clear overview of the instructional material, elicit the importance of problem-solving skills in this context, effectively sets the tone and expectations of the content

and included elements that enhanced understanding and engagement.

Table 2 shows the level of visual and auditory digital instructions in terms of content with regards to objective. Also shows the statements, mean, standard deviation and remarks.

Table 2. Level of Visual and Auditory Digital Instructions in terms of Content with regards to Objectives

The visual and auditory digital instructions...	MEAN	SD	REMARKS
<i>...effectively supported the understanding of the lesson content.</i>	4.48	0.82	Strongly Agree
<i>The lesson's learning objectives were presented through visual and auditory digital instructions.</i>	4.52	0.59	Strongly Agree
<i>The use of visual and auditory digital instructions enhanced the retention and comprehension of the lesson.</i>	4.32	0.69	Strongly Agree
<i>...facilitated a more engaging learning experience.</i>	4.56	0.58	Strongly Agree
<i>...contributed positively to achieving the learning objectives of this lesson.</i>	4.40	0.58	Strongly Agree
Weighted Mean	4.46		
SD	0.65		
Verbal Interpretation	Very High		

Table 2 presents the objective facilitated a more engaging learning experience. The mean ($M = 4.56$) suggests a very high level in terms of content objective. Also, it enhanced the retention and comprehension of the lesson. While the mean is lower ($M = 4.32$), it still indicates that the teachers strongly agree on the validity of the objective stated on the material.

To sum up, the content objective effectively supported the understanding of the lesson content, presented through visual and auditory digital instructions, enhanced the retention and comprehension of the lesson, facilitated a more engaging learning experience, and contributed positively to achieving the learning objectives of this lesson.

The level of visual and auditory digital instructions in terms of content with regards to objective attained a weighted mean score ($M = 4.46$, $SD = 0.65$) was verbally interpreted as *very high* among the respondents.

Table 3 shows the level of visual and auditory digital instructions in terms of content with regards to interactive elements. Also shows the statements, mean, standard deviation and remarks.

Table 3. Level of Visual and Auditory Digital Instructions in terms of Content with regards to Interactive Elements

Interactive Elements...	MEAN	SD	REMARKS
<i>The inclusion of interactive elements (e.g., quizzes, and simulations) in the visual and auditory digital instructions enhanced understanding of the problem-solving process.</i>	4.04	1.06	Agree
<i>...provided opportunities for hands-on learning and practical application of problem-solving techniques.</i>	4.20	1.00	Agree
<i>The visual and auditory digital instructions effectively engaged the attention and kept the focused on the problem-solving task.</i>	4.16	1.07	Agree
<i>...helped the learners to retain and recall the problem-solving steps more effectively compared to static instructions.</i>	4.12	0.83	Agree
<i>The use of interactive elements in the visual and auditory digital instructions can significantly improve problem-solving skills.</i>	4.24	0.78	Strongly Agree
Weighted Mean	4.15		
SD	0.94		
Verbal Interpretation	High		

Table 3 presents the interactive elements significantly improved problem-solving skills. The mean ($M = 4.24$) suggests a very high level in terms of interactive elements content. Also, the interactive elements enhanced understanding

of the problem-solving process. While the mean is lower ($M = 4.04$), it still indicates that the teachers agree on the validity of the interactive elements stated on the material. The level of visual and auditory digital instructions in terms of content with



regards to interactive elements attained a weighted mean score of (M = 4.15, SD = 0.94) was verbally interpreted as *high* among the respondents.

To sum up, the interactive elements enhanced understanding of the problem-solving process, provided opportunities for hands-on learning and practical application of problem-solving techniques, effectively engaged the attention, and kept the focused on the problem-solving task, helped the learners to retain and recall the problem-solving steps more effectively compared to static instructions, and significantly improve problem-solving skills.

Level of Visual and Auditory Digital Instructions in terms of Content with regards to Feedback Mechanism

Table 4 shows the level of visual and auditory digital instructions in terms of content with regards to feedback mechanism. Also shows the statements, mean, standard deviation and remarks.

The feedback mechanism significantly contributes to the improvement of problem-solving skills. The mean (M = 4.56) suggests a very high level in terms of feedback mechanism content. Also, it provides clear and concise feedback during problem-solving tasks. While the mean is lower (M = 4.08), it still indicates that the teachers agree on the validity of the feedback mechanism stated on the material.

Table 4. Level of Visual and Auditory Digital Instructions in terms of Content with regards to Feedback Mechanism

Feedback Mechanism	MEAN	SD	REMARKS
<i>The visual and auditory digital instructions provided clear and concise feedback during problem-solving tasks.</i>	4.08	1.04	Agree
<i>The feedback received through visual and auditory digital instructions helped the learners understand the progress and areas for improvement in problem-solving.</i>	4.36	0.86	Strongly Agree
<i>The visual and auditory digital instructions enhanced the ability to identify and rectify mistakes in problem-solving.</i>	4.32	0.80	Strongly Agree
<i>The feedback provided in the visual and auditory digital instructions was timely and relevant to the problem-solving tasks.</i>	4.12	0.78	Agree
<i>...in the visual and auditory digital instructions can significantly contribute to the improvement of problem-solving skills.</i>	4.56	0.51	Strongly Agree
Weighted Mean	4.29		
SD	0.82		
Verbal Interpretation	Very High		

Table 4 presents the level of visual and auditory digital instructions in terms of content with regards to feedback mechanism attained a weighted mean score (M = 4.29, SD = 0.82) was verbally interpreted as very high among the respondents.

To sum up, the feedback mechanism content provided clear and concise feedback during problem-solving tasks, helped the learners understand the progress and areas for improvement in

problem-solving, enhanced the ability to identify and rectify mistakes in problem-solving, provided a timely and relevant to the problem-solving tasks, and significantly contribute to the improvement of problem-solving skills.

Table 5 shows the level of visual and auditory digital instructions in terms of content with regards to additional resources. Also shows the statements, mean, standard deviation and remarks.

Table 5. Level of Visual and Auditory Digital Instructions in terms of Content with regards to Additional Resources

Additional Resources	MEAN	SD	REMARKS
<i>The inclusion of additional resources (e.g., diagrams, charts, supplemental materials) enhanced understanding of the instructions.</i>	4.36	0.91	Strongly Agree
<i>The visual and auditory digital instructions provided clarity and helped the learners to grasp the problem-solving steps more effectively.</i>	4.24	0.97	Strongly Agree
<i>...aided in visualizing complex concepts, making problem-solving more manageable.</i>	4.20	0.76	Agree
<i>The use of visual and auditory digital instructions improved the ability to apply problem-solving techniques.</i>	4.20	0.87	Agree
<i>The presence of additional resources in the visual and auditory digital instructions positively impacted the problem-solving skills.</i>	4.36	0.70	Strongly Agree
Weighted Mean	4.27		
SD	0.84		
Verbal Interpretation	Very High		



Table 5 presents the additional resources enhanced understanding of the instructions and positively impacted the problem-solving skills. The mean ($M = 4.36$) suggests a very high level in terms of additional resources content. Also, aided in visualizing complex concepts, making problem-solving more manageable and improved the ability to apply problem-solving techniques. While the mean is lower ($M = 4.20$), it still indicates that the teachers agree on the validity of the additional resources stated on the material.

The level of visual and auditory digital instructions in terms of content with regards to additional resources attained a weighted mean score ($M = 4.27$, $SD = 0.84$) was verbally interpreted as very high among the respondents.

To sum up, the additional resources content enhanced understanding of the instructions, provided clarity, and helped the learners to grasp the problem-solving steps more

effectively, aided in visualizing complex concepts, making problem-solving more manageable, improved the ability to apply problem-solving techniques, and positively impacted the problem-solving skills.

The level of visual and auditory digital instructions in facilitating students' problem-solving skills in terms of element

In this study visual and auditory digital instructions in facilitating students' problem-solving skills in terms of element include narrative structure, visual creativity, sound design, and time duration.

Table 6 shows the level of visual and auditory digital instructions in terms of element with regards to narrative structure. Also shows the statements, mean, standard deviation and remarks.

Table 6. Level of Visual and Auditory Digital Instructions in terms of Element with regards to Narrative Structure

The Narrative Structure...	MEAN	SD	REMARKS
<i>The visual and auditory digital instructions effectively establish a clear narrative structure to convey the problem-solving process.</i>	4.32	0.63	Strongly Agree
<i>The audio-visual elements (e.g., visuals, voice-over) are synchronized in a way that enhances the overall coherence and flow of the instructional content.</i>	3.92	1.08	Agree
<i>The use of visual and auditory digital instructions effectively guides the viewer through each step of the problem-solving process, maintaining a logical sequence.</i>	4.20	1.00	Agree
<i>...of the visual and auditory digital instructions assists in clarifying the relationships between different concepts and steps involved in problem-solving.</i>	4.36	0.70	Strongly Agree
<i>The visual and auditory digital instructions contribute significantly to the viewer's understanding and retention of the problem-solving methodology.</i>	4.16	0.90	Agree
Weighted Mean		4.19	
SD		0.88	
Verbal Interpretation		High	

Table 6 presents the narrative structure effectively establishes a clear narrative structure to convey the problem-solving process. The mean ($M = 4.36$) suggests a very high level in terms of narrative structural element. Also, it synchronized in a way that enhances the overall coherence and flow of the instructional content. While the mean is lower ($M = 3.92$), it still indicates that the teachers agree on the validity of the narrative structure stated on the material. The level of visual and auditory digital instructions in terms of element with regards to narrative structure attained a weighted mean score of ($M = 4.19$, $SD = 0.88$) was verbally interpreted as high among the respondents.

To sum up, the narrative structural element effectively establish a clear narrative structure to convey the problem-solving process, synchronized in a way that enhances the overall coherence and flow of the instructional content, effectively guides the viewer through each step of the problem-solving process, maintaining a logical sequence, assists in clarifying the relationships between different concepts and steps involved in problem-solving and contribute significantly to the viewer's

understanding and retention of the problem-solving methodology.

Level of Visual and Auditory Digital Instructions in terms of Element with regards to Visual Creativity

In this study visual and auditory digital instructions in facilitating students' problem-solving skills in terms of element with regards to visual creativity.

Table 7 shows the level of visual and auditory digital instructions in terms of element with regards to visual creativity. Also shows the statements, mean, standard deviation and remarks.

Table 7 presents visual creativity effectively utilizes innovative visual elements to enhance understanding and engagement. The mean ($M = 4.76$) suggests a high level in terms of visual creative element. Also, it complements the content effectively, making complex concepts easier to grasp. While the mean is lower ($M = 3.40$), it still indicates that the teachers agree on the validity of the visual creativity stated on the material.



Table 7. Level of Visual and Auditory Digital Instructions in terms of Element with regards to Visual Creativity

The Visual Creativity...	MEAN	SD	REMARKS
<i>The visual and auditory digital instructions in the research effectively utilize innovative visual elements to enhance understanding and engagement.</i>	4.76	0.88	Strongly Agree
<i>The visual components of the instructions are thoughtfully designed and contribute significantly to the overall learning experience.</i>	3.96	1.14	Agree
<i>The use of visual aids in the visual and auditory digital instructions complements the content effectively, making complex concepts easier to grasp.</i>	3.40	1.35	Agree
<i>...of the visual and auditory digital instructions positively effects students' problem-solving skills.</i>	3.48	1.56	Agree
<i>Overall, the visual creativity of the visual and auditory digital instructions significantly enhances the learning experience for students.</i>	4.32	0.90	Strongly Agree
Weighted Mean		3.98	
SD		1.28	
Verbal Interpretation		High	

The level of visual and auditory digital instructions in terms of element with regards to visual creativity attained a weighted mean score (M = 3.98, SD = 1.28) was verbally interpreted as high among the respondents.

To sum up, the visual creative element effectively utilizes innovative visual elements to enhance understanding and engagement, thoughtfully designed and contribute significantly to the overall learning experience, complements the content

effectively, making complex concepts easier to grasp, positively effects students' problem-solving skills and significantly enhances the learning experience for students.

Table 8 shows the level of visual and auditory digital instructions in terms of element with regards to sound design. Also shows the statements, mean, standard deviation and remarks.

Table 8. Level of Visual and Auditory Digital Instructions in terms of Element with regards to Sound Design

Sound Design	MEAN	SD	REMARKS
<i>The clarity of audio instructions significantly enhanced understanding of the problem-solving tasks.</i>	4.96	0.20	Strongly Agree
<i>The volume levels of the audio instructions were appropriate and did not cause any confusion or discomfort.</i>	4.24	1.01	Strongly Agree
<i>The use of audio cues and prompts effectively guided the learners through the problem-solving process.</i>	4.32	1.07	Strongly Agree
<i>The quality of the audio (e.g., absence of background noise, clear articulation) positively contributed to the learning experience.</i>	3.88	1.33	Agree
<i>The synchronization of audio with visual elements in the instructions was seamless and aid in comprehension.</i>	4.28	1.34	Strongly Agree
Weighted Mean		4.34	
SD		1.11	
Verbal Interpretation		Very High	

The sound design significantly enhanced understanding of the problem-solving tasks. The mean (M = 4.96) suggests a very high level in terms of sound design element. Also, it positively contributed to the learning experience. While the mean is lower (M = 3.88), it still indicates that the teachers agree on the validity of the sound design stated on the material.

The level of visual and auditory digital instructions in terms of element with regards to sound design attained a weighted mean score (M = 4.34, SD = 1.11) was verbally interpreted as very high among the respondents.

To sum up, the sound design element significantly enhanced understanding of the problem-solving tasks, were appropriate and did not cause any confusion or discomfort, effectively

guided the learners through the problem-solving process, positively contributed to the learning experience, and was seamless and aid in comprehension.

Level of Visual and Auditory Digital Instructions in terms of Element with regards to Time Duration

In this study visual and auditory digital instructions in facilitating students' problem-solving skills in terms of element with regards to time duration.

Table 9 shows the level of visual and auditory digital instructions in terms of element with regards to time duration. Also shows the statements, mean, standard deviation and remarks.



Table 9. Level of Visual and Auditory Digital Instructions in terms of Element with regards to Time Duration

Time Duration	MEAN	SD	REMARKS
<i>The length of visual and auditory digital instructions provided was appropriate for the content presented.</i>	4.48	0.77	Strongly Agree
<i>The duration of visual and auditory digital instructions allowed the learners to grasp the key concepts effectively.</i>	4.16	0.99	Agree
<i>The time allotted for visual and auditory digital instructions enhanced problem-solving skills.</i>	4.28	1.02	Strongly Agree
<i>The duration of visual and auditory digital instructions was balanced with the time spent on other learning activities.</i>	4.16	0.99	Agree
<i>...of visual and auditory digital instructions would have improved the learning experience.</i>	4.32	0.75	Strongly Agree
Weighted Mean	4.28		
SD	0.90		
Verbal Interpretation	Very High		

The time duration provided was appropriate for the content presented. The mean ($M = 4.48$) suggests a very high level in terms of element time duration. Also, it allowed the learners to grasp the key concepts effectively and was balanced with the time spent on other learning activities. While the mean is lower ($M = 4.16$), it still indicates that the teachers agree on the validity of the time duration stated on the material.

The level of visual and auditory digital instructions in terms of element with regards to time duration attained a weighted mean score ($M = 4.28$, $SD = 0.90$) was verbally interpreted as very high among the respondents.

To sum up, the element provided was appropriate for the

content presented, allowed the learners to grasp the key concepts effectively, enhanced problem-solving skills, was balanced with the time spent on other learning activities and would have improved the learning experience.

Level of Students' Problem-Solving Skills

In this study the students' problem-solving skills include narrative structure, visual creativity, sound design, and time duration.

Table 10 shows the distribution of scores indicating the level of students' problem-solving skills in terms of logical reasoning. The descriptive values provide an interpretation of the corresponding score ranges.

Table 10. Level of Students' Problem-Solving Skills in terms of Logical Reasoning

Score	Frequency	Percentage	Remarks
13-15	11	14%	Outstanding
10-12	14	18%	Very Satisfactory
7-9	30	38%	Satisfactory
4-6	21	27%	Fairly Satisfactory
1-3	2	3%	Did Not Meet Expectations
Weighted Mean = 8.49		100%	Multi-Structural

Table 10 presents the frequency distribution that most students fall within the satisfactory or multi-structural level of logical reasoning skills in problem-solving tasks, with thirty (30) or the thirty-eight percent (38%) of students scoring between 7 and 9. Additionally, it is noteworthy that fourteen (14) or eighteen percent (18%) of students scored in the range of 10 to 12, indicating a very satisfactory or relational level of proficiency in logical reasoning when tackling problem-solving tasks. Furthermore, eleven (11) or the fourteen percent (14%) of students achieved scores in the range of 13 to 15, classified as outstanding or extended abstract level of logical reasoning to solve problems.

Conversely, twenty-one (21) or twenty-seven percent (27%) of students scored in the range of 4 to 6, categorized as fairly satisfactory or unistructural level in their logical reasoning skill. And two (2) or three percent (3%) of students scored between

1 to 3, signifying that they did not meet expectations or pre-structural level of logical reasoning skills for problem-solving tasks. Overall, the mean score of 8.49 suggests a multi-structural level of logical reasoning, indicating that the students demonstrate satisfactory to outstanding in problem-solving skills.

Table 11 shows the distribution of scores indicating the level of students' problem-solving skills in terms of critical thinking. The descriptive values provide an interpretation of the corresponding score ranges.

Table 11 presents the frequency distribution that most students fall within the satisfactory or multi-structural level of critical thinking skills in problem-solving tasks, with sixty-two (62) or the seventy-nine percent (79%) of students scoring between 7 and 9.



Table 11. Level of Students' Problem-Solving Skills in terms of Critical Thinking

Score	Frequency	Percentage	Remarks
13-15	12	15%	Outstanding
10-12	4	5%	Very Satisfactory
7-9	62	79%	Satisfactory
4-6	0	0%	Fairly Satisfactory
1-3	0	0%	Did Not Meet Expectations
Weighted Mean = 9.95		100%	Relational

Additionally, it is noteworthy that four (4) or the five percent (5%) of students scored in the range of 10 to 12, indicating a very satisfactory or relational level of proficiency in critical thinking when tackling problem-solving tasks.

Furthermore, twelve (12) or fifteen percent (15%) of students achieved scores in the range of 13 to 15, classified as outstanding or extended abstract level of critical thinking to solve problems.

Interestingly, no students scored within the ranges of 4-6 or 1-3, indicating that none of the students were classified as fairly

satisfactory or did not meet expectations in terms of logical reasoning skills.

Overall, the mean score of 9.95 suggests a relational level of critical thinking, indicating that the students demonstrate satisfactory to outstanding in problem-solving skills.

Table 12 shows the distribution of scores indicating the level of students' problem-solving skills in terms of analytical skill. The descriptive values provide an interpretation of the corresponding score ranges.

Table 12. Level of Students' Problem-Solving Skills in terms of Analytical Skills

Score	Frequency	Percentage	Remarks
13-15	25	32%	Outstanding
10-12	6	8%	Very Satisfactory
7-9	47	60%	Satisfactory
4-6	0	0%	Fairly Satisfactory
1-3	0	0%	Did Not Meet Expectations
Weighted Mean = 10.74		100%	Relational

Table 12 presents the frequency distribution that most students fall within the satisfactory or multi-structural level of analytical skill in problem-solving tasks, with forty-seven (47) or sixty percent (60%) of students scoring between 7 and 9.

Additionally, it is noteworthy that six (6) or eight percent (8%) of students scored in the range of 10 to 12, indicating a very satisfactory or relational level of proficiency in analytical skills when tackling problem-solving tasks.

Furthermore, twenty-five (25) or thirty-two percent (32%) of students achieved scores in the range of 13 to 15, classified as outstanding or extended abstract level of analytical skill to solve problems.

Interestingly, no students scored within the ranges of 4-6 or 1-3, indicating that none of the students were classified as fairly

satisfactory or did not meet expectations in terms of analytical skill.

Overall, the mean score of 10.74 suggests a relational level of analytical skill, indicating that the students demonstrate satisfactory to outstanding in problem-solving skills.

Effect of the Content and Element of Visual and Auditory Digital Instructions on Students' Problem-Solving Skills

To test the significant effect of the content and element of visual and auditory digital instructions on students' problem-solving skills data were treated statistically using Minitab 14 using the T-test, and associated p-values.

Table 13 shows the results of the statistical analysis of the significant effect of the content of visual and auditory digital instructions on students' problem-solving skills.

Table 13. Significant Effect of the Content of Visual and Auditory Digital Instructions on Students' Problem-Solving Skills

Visual And Auditory Digital Instructions	Students' problem-Solving Skills	T-value	P-value	Analysis
Content	Logical Reasoning	5.314	0.000	significant
	Critical Thinking	6.004	0.000	significant
	Analytical skill	2.997	0.002	significant

*significant at .05 level of significance

Visual and auditory digital instructions' content show a significant effect on students' problem-solving skills (p = 0.000

to 0.002). The results suggest that the content of the Visual & Auditory Digital Instruction significantly influences students'



problem-solving skills. This underscores the importance of carefully designing and implementing instructional content and elements in digital environments to enhance students' problem-solving abilities.

Table 14. Significant Effect of the Element of Visual and Auditory Digital Instructions on Students' Problem-Solving Skills

Visual And Auditory Digital Instructions	Students' problem-Solving Skills	T-value	P-value	Analysis
Element	Logical Reasoning	4.896	0.000	significant
	Critical Thinking	5.432	0.000	significant
	Analytical skill	2.519	0.007	significant

**significant at .05 level of significance*

Table 14 shows the results of the statistical analysis of the significant effect of the element of visual and auditory digital instructions on students' problem-solving skills.

Visual and auditory digital instructions' elements show a significant effect on students' problem-solving skills ($p = 0.000$ to 0.007). The results suggest that the content of the Visual & Auditory Digital Instruction significantly influences students' problem-solving skills. This underscores the importance of carefully designing and implementing instructional content and elements in digital environments to enhance students' problem-solving abilities.

4. CONCLUSION AND RECOMMENDATIONS

The students showed multi-structural level of problem-solving skills. Also, they exhibited relational level of logical reasoning, relational level of critical thinking and relational level of analytical skill.

The findings indicate that the content of visual and auditory digital instructions influenced students' problem-solving skills. Similarly, it indicates that the element of visual and auditory digital instructions influenced students' problem-solving skills.

Therefore, facilitating students through visual and auditory digital instructions improve students' problem-solving skills.

With the confirmation of a significant effect of visual and auditory digital instructions on students' problem-solving skills, it is imperative for educational institutions, curriculum developer and instructional providers to harness the potential of visual and auditory digital instructions to optimize problem-solving outcomes. As such, the following recommendations are proposed to capitalize on the study's findings:

1. Educators should adopt a multimodal approach to instruction, leveraging both visual and auditory stimuli to cater to diverse learning preferences and enhance engagement.
2. Learners may engage not only with interactive multimedia components, audiovisual presentations, and simulations but also with visual and auditory digital instructions. This interaction fosters an immersive learning environment conducive to the development of critical problem-solving skills and practical knowledge essential for academic success.
3. Encouraging collaborative research endeavors and partnerships between academia, industry, and technology providers can drive innovation in digital instructional design.

REFERENCE

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