

# MULTISENSORY LEARNING STRATEGIES

## **Multisensory Learning Strategies: Teacher Preparedness**

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### **Abstract**

The purpose of this study was to examine teacher preparedness in multisensory reading strategies. A multisensory approach to learning incorporates visual, auditory, kinesthetic, and tactile senses simultaneously for learning. This method enables students to use their secondary senses to help them with the reading skills they may struggle with (Rostan et al., 2020). This study specifically sought to determine if there were any significant differences among teachers in their knowledge, perception, and implementation of multisensory reading strategies. A purposive sampling yielded a sample of 104 teachers from pre-k to 12th grade who voluntarily completed the Multisensory Learning Strategies Survey (MLSS). This 30-item Likert-type survey was developed by the researcher and yielded a Cronbach's Alpha of .71, suggesting a high reliability coefficient. Frequencies, means and standard deviations, and Analysis of Variance (ANOVA) and a multiple regression were calculated. Results showed significant differences among teachers in their knowledge and perception of multisensory learning strategies based on age. Teachers between 21-40 years of age were more likely to have positive knowledge and perception of multisensory learning strategies than participants who were 41 years and older. Teachers who taught grades pre-k-2nd grade were likely to implement multisensory learning strategies in the classroom than those who taught higher grades. Only one participant (1%) was unprepared, 17% were somewhat prepared, 66% were prepared while 20% were very well prepared. Implications for this study suggest that providing consistent professional development for teachers to stay up to date with modern technology would promote multisensory learning strategies.

## **Multisensory Learning Strategies**

Schools across the United States have faced sweeping, unprecedented changes to teaching and learning because of the Coronavirus (COVID-19) pandemic, which forced them to close in spring 2020. Many K-12 educators transitioned rapidly to online, remote instruction with very short notice and often very little to no training. Early elementary grade teachers had to quickly move their literacy content online as well as to navigate around the technology to make teaching possible in the areas of phonics, reading and writing (Silverman, 2022).

The return to schools in September 2021 brought an additional layer of challenges still related to Covid. Students and staff were required to submit weekly test or vaccination records. All had to wear masks, sit behind sneeze guards, and distance themselves six feet apart from one another. Small group instruction was limited to mainly quadrants of the classroom. Instruction was interrupted multiple times a week due to quarantine regulations for both staff and students (Jamieson & Whinnery, 2021; Hoofman & Secord, 2021).

A case in point of just how much literacy training suffered during the pandemic is the following. After assessing students in the first and second grade during the 2021-2022 academic year, the National Assessment of Educational Progress Assessment showed little growth in reading (NCES, 2022). In a combined average of reading scores, regardless of ethnicity and gender, 83% of students in grades 1-2 were considered remedial; 9% were low; 7.5% were average; and only 1% were considered high (NCES, 2022).

As educators reflected on these conditions in 2023, they were left with this question as they moved forward: How do we teach foundational literacy skills in these conditions? A second and related question also pertains: Why were students reading skills below par even before Covid? Students seem to be missing the foundational skills necessary to be effective readers.

One reason for the low literacy scores during Covid was that teachers reported implementing less literacy instruction in general. The smallest declines were seen in code-focused, foundational skills, while the largest declines were in language-focused practices such as extended writing, vocabulary knowledge, and reading comprehension strategies (Hoofman & Secord, 2021).

The restrictions that came with Covid-19 clearly caused numerous educational interruptions with literacy achievement of the utmost concern, yet the pandemic only exacerbated what was already a problem in K-12 schools across the board. For example, in 2017, after assessing fourth grade students every 2 years for 17 years, the NAEP showed little growth in reading. In a combined average of reading scores, regardless of ethnicity and gender, 34% of fourth grade students were considered Below Basic Proficiency; 31% were at or Above Basic Proficiency; 26% were at or Above Proficiency; and only 9% were considered Advanced (NCES, 2019).

While the rise in illiteracy rates during the pandemic was alarming, at least it is understandable. What is not acceptable is that before the pandemic students reading in the “average” proficiency range was already too low while few students ever seem to become “advanced” readers. Indeed, students in the American school system seem to be missing the foundational skills necessary to be effective readers. Research statistics alone should require teachers and administrators to revisit how foundational skills, specifically phonics, are taught daily.

More to the point of this current study is the ways in which a multisensory learning paradigm and pedagogy could improve the literacy statistics in grades K-12. For example, of the many characteristics of phonics instruction, one of them must be that it is multisensory.

Activities should include visual, auditory, kinesthetic, and tactile elements (Lane, 2022). The idea behind a multisensory approach is that connections between the symbols the student sees, the sounds the student hears, and the movements the student feels are consistently reinforced.

### **Problem Statement**

It is important to note that due to the COVID-19 pandemic, students in Grades PreK through 2nd have not had formal education prior to the 2022-2023 school year, yet the challenges that teachers and students in early literacy classrooms are facing are surmountable. During the last ten years, teachers have been using a variety of curricular resources, standards, and strategies in the classroom to teach reading.

Some reasonable and appropriate questions to ask because of the importance of literacy training in the early grades, therefore, were the following: Have teachers received sufficient professional development and training around teaching students how to read? Do teachers have the appropriate toolkits to scaffold daily instruction? The answers to these questions were addressed in the following section that proposed research about multisensory reading approaches.

### **Purpose of the Study**

This study sought to examine teacher preparedness for multisensory learning strategies in the classroom. Specifically, the study sought to determine if there were any significant differences among teachers in their knowledge, perception, and implementation of multisensory reading strategies to assist struggling readers in the classroom.

This study sought to examine the following research questions:

1. Are there any significant differences among participants in their knowledge of multisensory reading strategies?

2. Are there any significant differences among participants in their perception of multisensory reading strategies?
3. Are there any significant differences among participants in their implementation of multisensory reading strategies?

### **Description of the Setting**

The study was conducted at one of the largest public-school districts in New Jersey. The racial and ethnic diversity of the city provides a rich educational experience for pre-kindergarten to secondary school students. The district serves over 28,000 students from diverse backgrounds in 40 schools (NJDOE, 2021).

The school of study is a multi-racial multi-lingual pre-K through 8<sup>th</sup> grade of profound diversity and economic need. The student body includes about 853 students, with the primary languages of Arabic, Gujarati, Hindi, Tagalog, and Spanish spoken at home. The students who are economically disadvantaged make up 69.3% of the student population, a majority (NJDOE, 2021).

The professional staff is somewhat less diverse. A total of 63 full-time teachers are employed in this school, with an average of 15 years of experience in education. According to the New Jersey Department of Education School Performance Report, 58% of the teaching staff have at least a bachelor's degree and about 48% of the teaching staff have obtained a master's degree.

### **Literature Review**

According to Carreker et al. (2007) students need to have a substantial foundation for early literacy and phonemic awareness. This requires teachers to revisit how foundational skills, specifically phonics, are taught daily. Of the many characteristics of phonics instruction, one of

them must be that it is multisensory. According to Main (2022), the founder of Structural learning, one of the most popular techniques for teaching the alphabet to young children is multisensory instruction. As they may use several sensory inputs to build connections between facts or ideas, children are better able to perceive, comprehend, and synthesize information using this strategy.

Multisensory approach to learning is a strategy that incorporates visual, auditory, kinesthetic, and tactile simultaneously for learning. This method enables students to use their secondary senses to help them with the reading skills they struggle with (Rostan et al., 2020). Multisensory strategy was first developed to help students who struggled with reading, particularly students with dyslexia; multisensory strategies enable educators to use different modalities to engage students and enable students to grasp the skills or concepts being taught (Shamir, 2018; Rostan et al., 2020).

An organized literacy strategy called Orton-Gillingham is used to help students who have trouble with reading, writing, spelling, and understanding (Stevens et al., 2021). The Orton-Gillingham method is named after Dr. Samuel Orton and Anna Gillingham. Anna Gillingham, who was an educator and psychologist, developed a strong desire to aid her students in learning to read. She was one of the first educators to apply multimodal techniques with her pupils, as a result she witnessed significant gains in her students (Stevens et al., 2021).

Integrating technology in the classroom gives students the opportunity to be active learners (Ford-Lanza, 2022), an assistive technology practitioner and founder of Adapt and Learn says that with the help of assistive technology, children of all abilities can study, function, and be independent in the classroom. Assistive technology allows students to demonstrate their knowledge and be more independent as they benefit from multi-sensory instructional technology.



Some of these types of technologies that are beneficial at reinforcing topics are educational games, audio books and educational applications (Shamir, 2018; Ford-Lanza, 2022).

These types of technologies have been used by people with disabilities to study and work, but they can be used in the educational field. According to Sorrels (2019), multisensory technologies are perfect for effectively supporting an embodied and active educational approach that takes advantage of the most appropriate sensory modality to convey a topic in a classroom. With the help of multisensory technologies, the teacher can choose from a variety of tactics that accurately and quickly map motor action to various aspects of sound, music, tactile objects, and visual media (Sorrels, 2019).

### **Multisensory Strategies**

The brain is one of the most complex and mysterious organs in the human body. While extensive research has been conducted and provided on the function of the brain, humanity still falls short on understanding it fully. Early researchers believed that the brain constructed itself through the connection of neurons with new neurons, specifically shortly after birth (“What is neurogenesis?” 2021).

Recent researchers have clarified that the brain does continue to develop, adapt, and change throughout life (Sorrells et al., 2018). The 21st century includes countless accounts of new information and experiences. These experiences have caused a shift in how students respond and recall information. It is important to consider how a human’s five senses provides a pathway to recognize sensations, provoke behaviors and build memory.

**Visual Strategies.** According to brain research, the brain can register 36,000 visual images per hour (Wilmes et al., 2008). Visual support can enhance learning especially when the

relationship between focus and the visual system are compared. When the eyes intake information, it is sent from the eyes to the thalamus, and up to the visual cortex in the brain.

Feedback returns from the visual cortex through the thalamus and to the eyes. This feedback is the mechanism that maintains attention. Feedback returns from the visual cortex through the thalamus and to the eyes. This feedback is the mechanism that maintains attention (Jensen, 1998). Students will find more difficulty paying attention in a lecture that involves mostly stillness. Therefore, effective visual strategies that must be embedded in the classroom include increased mobility of teachers and students in the classroom. Additionally, including visual displays to demonstrate content, color-code materials, is believed to be a rich classroom – one that is full of visual stimulations such as posters, mobiles, maps, pictures, and graphic organizers; will positively impact student learning at some level.

Visual stimulation is extremely important because it is necessary to reach comprehension. Imagery is what helps us comprehend and remember material we study. Visual representations allow us to access and grasp abstract concepts (Jensen, 1998). Providing multiple visual strategies within the classroom is extremely helpful and effective.

Smartboards have become a lot more interactive and serve as a means of projecting information, solving problems, and using various tools simultaneously. This means teachers must develop intentional lesson plans and learning tasks that involve visual support. Classrooms can have focus walls for specific content areas or domain-specific tasks. Bulletin boards can be used to display information, increase interests, engage or “hook” students into a study.

**Auditory Strategies.** Auditory strategies, like visual strategies, are beneficial to student understanding and development. Auditory strategies make a great impact on students' language

acquisition and development. Every stage of development includes auditory building blocks that help children grow on the vocabulary they hear (Jensen, 1998).

One aspect of auditory stimulation is music. Music is believed to enhance spatial temporal reasoning. Brain research has suggested that infants are quite receptive to and discerning of music. Thus, exposure to music at an early age is highly encouraged. Music has other benefits in helping the brain. In the brain, neurons are constantly firing across neural pathways as a means of communication. Clear thinking results when the neurons fire in a specific pattern determined by speed, sequence, and strength. Select pieces of music can be a trigger to a pattern – hence, some people may work better with quiet music playing (Jensen, 1998).

In addition to the above mentioned, music can “enrich the human intellect and spirit” (Wilmes et al., 2008, p. 662). Teachers may use music to perk up their students or to create a relaxing atmosphere, develop community in the classroom as well as assist students with limited verbal skills (Wilmes et al., 2008). Other examples of auditory strategies include pre-recorded stories and texts that students can use to follow along with text (ex. audiobooks). We also have text-to-speech services that are now embedded in most online platforms for learning.

**Kinesthetic Strategies.** Like auditory and visual strategies, kinesthetic strategies provide additional benefits in the classroom. Researchers discovered that one part of the brain processes both movement and learning. Movement is believed to stimulate learning. Additionally, exercise releases a natural substance that assists neurons in communicating with one another more effectively. This enhances cognition; hence, movement has a strong correlation to increased learning.

Movement does not only have to take place in the physical education classroom. Teachers can utilize movement throughout the school day. Cross content areas, students can participate in tasks that allow them to move around the room, simulate math problems and engage in walks, displays, etc. Tactile experiences are also incredibly important in the classroom.

Many researchers, such as Piaget, speak of the importance of experiential materials to aid learning. There is a range of suggested examples of manipulatives that can be easily utilized in the classroom. These manipulatives can include blocks, plastic cubes, colored rods, geoboards, and tangrams.

## **Methodology**

### **Sampling**

The study employed a sample of 104 educators, which included both males and females, and their level of education ranged from a bachelor's degree to a master's degree. Participants were certified in all areas such as General Education, Special Education, ESL/Bilingual Education, and others. Teachers' ages ranged from 21 to 51 or more years. Participants' current instructional grade or grades teaching ranged from pre-kindergarten to 12 grades. Years of teaching experience were also reported.

### **Measures**

**Demographic Information.** The survey measured participants' demographics such as gender, age, grade level, education level, years of experience and certification. ESL/Bilingual education, all or other.

**Multisensory Learning Strategies Survey (MLSS).** This 30-item Likert-type survey was developed by the researcher and mentor for the purpose of the study. The MLSS is a survey

that can be completed through a Google Form. The survey is divided into four parts: Demographic information of the teacher, teacher knowledge of multisensory learning, teacher perception of multisensory learning, and teacher implementation of multisensory learning.

**Reliability.** Cronbach's Alpha was used to assess the internal reliability of the MLSS. The reliability coefficient index of .71 was obtained. This suggests that the MLSS is a reliable instrument because it can continue to measure the same constructs throughout time and generate consistent results, indicating high reliability or consistency.

### **Procedure**

**Informed Consent.** Consent for this research was sought from the Superintendent of Schools. The Superintendent of Schools approved the dissemination of the survey to certified teachers in the district. The MLSS was distributed via email to all teachers in the district with a copy of the consent letter. Teachers were made aware that they did not have to participate, and they could quit the survey at any point. Teachers were also made aware that the survey was anonymous, and their names would not appear on the survey. Approval to conduct the study was obtained from the Superintendent of the school district and Georgian Court University's Internal Research Review Board (IRRB).

**Questionnaire Distribution and Procedure.** Participants were surveyed via email. Teachers were given two weeks to review the prompts provided and submit the survey. Results were automatically registered in a Google Sheet that captured the summary responses for each prompt. Completion of the survey took approximately 10-15 minutes. When completed, participants submitted their survey.

The survey items were statements that require responses from a scale of 1 through 5 (1- Strongly Disagree; 2- Disagree; 3- Neutral; 4- Agree; 5- Strongly Agree). The survey questions

were scored as follows: strongly disagree was scored “1”, disagree was scored “2”, neutral was scored “3”, agree was scored “4” and strongly agree was scored “5”.

### **Data Analysis**

All statistical calculations were done using the Statistical Package for Social Sciences (SPSS). Frequencies, means and standard deviations, and an Analysis of Variance (ANOVA) were calculated to answer the research questions.

## **Results**

### **Frequencies**

Table 1 shows frequency distribution of the sample based on the different demographics such age, education level, grade level for instruction, teaching experience and certification. There were 104 educators who participated in this study. See Table 1 for all the demographic information.

**Table 1**

## Demographic Description of Teachers

Variable	Frequency N=104	Percentage %
<b>Education</b>		
Bachelor's Degree	40	38.5
Master's Degree	64	61.5
<b>Certification</b>		
General Education	5	4.8
Special Education	54	51.9
ESL/Bilingual Education	14	13.5
All Areas	19	18.3
Other	12	11.5
<b>Gender</b>		
Male	40	38.5
Female	64	61.5
<b>Age</b>		
21-40	23	22.1
41-50	39	37.5
51+	42	40.4
<b>Instructional Grade(s) Teaching</b>		
Pre-k-2nd grade	33	31.7
3rd-5th grade	25	24.0
6th-8th grade	40	38.5
9th-12th grade	6	5.8
<b>Years of Experience</b>		
0-3 years	9	8.7
4-9 years	11	10.6
10-15 years	13	12.5
16-20 years	32	30.8
21+ years	39	37.5

### **Teacher Knowledge, Perception, and Implementation**

An Analysis of Variance (ANOVA) was conducted to determine significant differences amongst participants in their knowledge, perception, and implementation of multisensory reading strategies. Included in Table 2 are the means and standard deviations for teachers' knowledge, perception, and implementation of multisensory reading strategies from the Multisensory Learning Strategies Survey (MSLSS).

A significant difference among the participants in their knowledge of multisensory learning strategies was found based on age. For example, those who were 21-40 years of age ( $M=42.48$ ,  $SD=4.75$ ), had a significantly higher mean than those who were between the ages of 41-50 ( $M=41.49$ ,  $SD=4.89$ ), and 51-above ( $M=38.86$ ,  $SD=7.93$ ).

A significant difference among the participants in their perception of multisensory learning strategies was found based on age. Those who were 21-40 years old ( $M=42.35$ ,  $SD=5.16$ ), had a significantly higher mean in perception than those who were 41-50 years old ( $M=40.46$ ,  $SD=5.88$ ) and 51-above ( $M=37.71$ ,  $SD=7.50$ ).

A significant difference among the participants in their implementation of multisensory learning strategies was found based on current instructional grades teaching. Those who taught in grades prek-2nd grade ( $M=37.67$ ,  $SD=7.20$ ) had a significantly higher mean than those who taught in 3rd-5th grade ( $M=34.76$ ,  $SD=5.22$ ), 6th-8th grade ( $M=28.23$ ,  $SD=8.62$ ) and 9th-12th grade ( $M=30.83$ ,  $SD=4.50$ ). See Table 2 for all the means and standard deviations for the MLSS.



**Table 2**

Means and Standard Deviations for Multisensory Learning Strategies

Demographic	Knowledge		Perception		Implementation	
	Means	SD	Means	SD	Means	SD
<b>Education</b>						
Bachelor's Degree	41.13	7.21	40.03	7.61	34.25	7.98
Master's Degree	40.41	5.89	39.61	6.03	34.13	8.41
<b>Certifications</b>						
Gen. Ed.	45.00	5.00	39.80	10.01	41.60	8.62
Sped. Ed.	41.13	5.30	40.52	5.64	32.67	8.63
ESL/Bilingual Ed.	38.57	7.99	37.29	8.41	30.21	6.51
All Cert.	39.05	8.78	39.47	8.39	34.11	8.01
Other	41.92	4.12	39.75	3.86	31.92	7.23
<b>Gender</b>						
Male	40.10	5.60	40.15	6.60	30.95	8.79
Female	40.82	6.60	39.68	6.70	33.42	8.13
<b>Age</b>						
21-40	42.48*	4.75	42.35*	5.16	32.26	8.87
41-50	41.59	4.89	40.46	5.88	34.00	7.47
51+	38.86	7.93	37.71	7.50	32.33	8.73
<b>Grade(s) teaching</b>						
Pre-k-2nd grade	41.64	4.47	40.91	5.50	37.67*	7.20
3rd-5th grade	41.72	4.34	41.64	4.50	34.76	5.22
6th-8th grade	39.40	8.52	38.08	8.25	28.23	8.62
9th-12th grade	39.67	5.96	37.00	5.59	30.83	4.50
<b>Experience</b>						
0-3 years	40.22	5.14	39.00	5.32	31.44	6.02
4-9 years	38.64	9.85	37.00	9.93	30.18	10.08
10-15 years	40.92	6.97	40.31	6.54	29.62	8.57
16-20 years	41.22	5.40	39.66	5.81	33.69	7.45
21+ years	40.85	6.28	40.64	6.61	34.56	8.54

\*Means are significant at  $\geq .05$

**Overall Teacher Preparedness**

For this study, overall teacher preparedness meant that teachers are knowledgeable about multisensory learning strategies, have a positive perception and implement multisensory learning strategies. Teachers' overall preparedness was calculated to determine their overall depth of knowledge, perception, and implementation of multisensory reading strategies. Total preparedness was marked out at 150 points. For instance, participants' total score on the scale for preparedness were marked as follows: below 50 = not prepared; between 51 and 100 = somewhat prepared; 101-125 = prepared; 126 and above = very prepared. Results of the study showed that only one participant (1%) was unprepared while 17% were somewhat prepared. Most of the participants (66%) were prepared while 20% were very well prepared. See Table 3 for overall teacher preparedness.

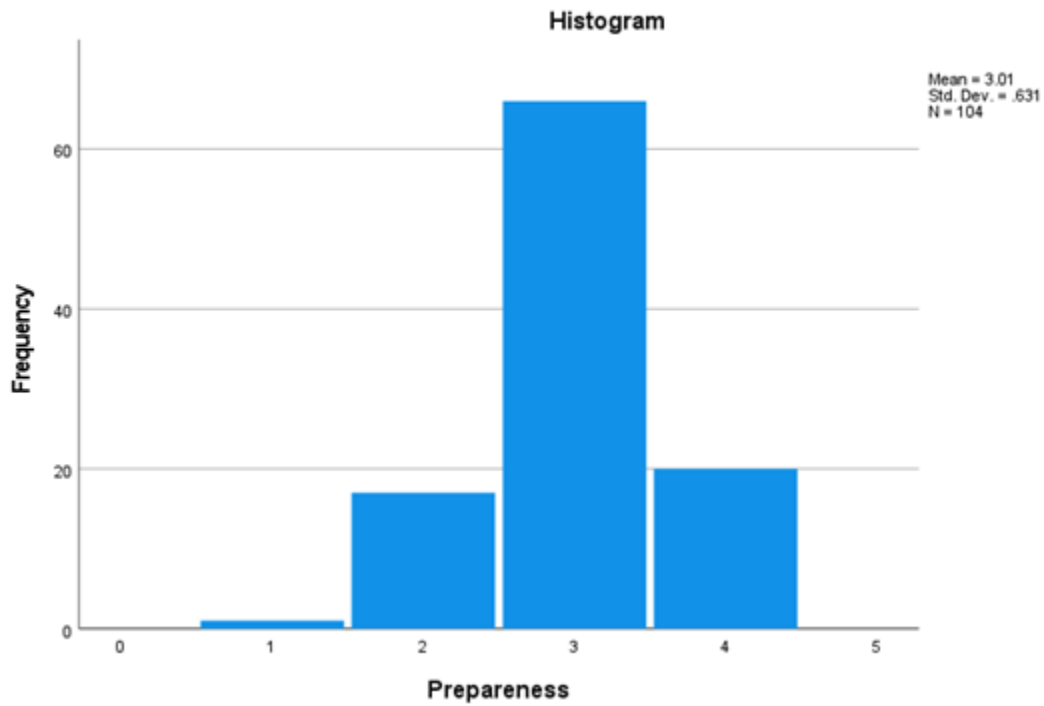
**Table 3**

Overall Teacher Preparedness

	Frequency N= 104	Percent %
Not Prepared	1	1.0
Somewhat Prepared	17	16.3
Prepared	66	63.5
Very Prepared	20	19.2

**Chart**

Overall Preparedness Chart



### Discussion

Results showed a significant difference among teachers in their knowledge of multisensory learning strategies based on their age. Those who were between the ages of 21-40 had a significantly higher mean score than those who were between the ages of 41-50, and 51-above. This is an interesting finding that most likely indicates the exposure to technology and self-training that the younger age group has. It is therefore possible that younger participants in this study may have had courses or training in using assistive technology (AT) in the classroom which promoted auditory and visual learning.

Teacher age and lack of exposure to technology should not be a factor in using the best practices for teaching, and that includes multisensory reading theory and pedagogy. Most K-12 schools already employ programs such as New Teacher Orientation which guide and support teachers with tools like classroom management and teaching strategies to meet performance standards. One such strategy should be multisensory theory and practice.

Many colleges now provide technology courses for pre-service teachers to incorporate in the classrooms. In some colleges, pre-service teachers are learning how to use educational technology like virtual reality to give students a visual of what is being taught. Other colleges also provide pre-service teachers with courses like computer programming or coding. Coding can be used in the classroom for students to use their senses for problem-solving skills in many content areas.

Unfortunately, predictable reasons still exist for why teachers of students from 6th to 12th grade scored a lower mean for being less likely to have knowledge of multisensory learning strategies. While those who teach pre-k to 5th grade had a greater knowledge of multisensory learning strategies, those who teach students from pre-k through 5th grade likely used

multisensory approaches for introducing phonological awareness, listening to read-aloud and learning through body movements.

Furthermore, third grade is when students start preparing to take the state test for the first time (NJSLA), so they need to be able to understand and grasp the skills being taught. Teachers are therefore tasked with teaching phonic skills through multisensory programs like *Sunday Essentials*. Programs like *Sunday Essentials* promote learning sounds through repetition and writing letters in the air. Teachers in pre-k-5th grade model reading skills through read-aloud as students follow along. Also, they use manipulatives to teach vocabulary and build words.

The grade that an educator teaches, therefore, can and does impact how much understanding of multisensory learning they have as opposed to their knowledge of AT. Aldehami, (2022) found in his research that no significant differences in teachers' knowledge of AT existed based on grade level taught. The mean score for teachers' level of AT knowledge increased only slightly. Aldehami found that high school teachers scored the lowest mean, and elementary teachers had the highest mean score. In this current study, sixth to eighth grade teachers scored the lowest mean average for knowledge of multisensory learning strategies.

The mean score represented that 6th to 8th grade teachers were less likely to have knowledge of multisensory learning strategies as compared to teachers in other grade levels. This result may be due to teachers in primary grades focusing on teaching foundational skills for reading and writing. Many teachers in primary grades teach students the alphabet through chants, rhymes and songs as students see it displayed on the interactive board or on flash cards. Some teachers start teaching writing concepts by having students write letters on sand or using shaving cream.

### **Perception of Multisensory Learning Strategies**

A significant difference was found among participants in their perception of multisensory learning strategies based on age. Those who were 21-40 years of age had a significantly higher mean score than those who were between the ages of 41-50, and 51-above. Teachers between the ages of 21-40 years of age were most likely to have a positive perception of multisensory learning strategies. It is possible that these teachers may have been more exposed to multisensory learning strategies as students in college, thus preferring multisensory learning.

Kulaksiz and Toran (2022) sought to explore what pre-service teachers know about the implementation of technology. Findings from this study demonstrated a change in pre-service teachers' attitudes about technology in education. As the pre-service teachers deepened their technology skills during preparation of the lessons, they began to gain a positive attitude towards implementation of technology in the classroom.

### **Implementation of Multisensory Learning Strategies**

A significant difference was found among the participants in their implementation of multisensory learning strategies based on the grade level taught. Teachers who taught grades pre-k-2nd had a significantly higher mean score than those who taught grades 6-8.

Teachers who taught grades pre-k-2nd grade were shown to be most likely to implement multisensory learning strategy in their classrooms. Early childhood education teachers are constantly using multisensory learning strategies like visual, kinesthetic, auditory, and visual to keep students engaged and support their learning. For these teachers, it is essential to use multisensory learning strategies for reinforcing letters and sounds, allowing students to write letters in sand or shaving cream and tapping their fingers as they say each sound in a word.

A study by Eutsler (2021) demonstrated how early childhood pre-service teachers were able to apply multiple modes of communications to the digital book allowing readers to listen to the book aloud, read it on their own, listen to an audio narration or view in a video format.

The overall preparedness for teachers' depth of knowledge, perception, and implementation demonstrated that only one teacher was “unprepared.” This might have been because the teacher was not interested in the survey. Teachers who were “somewhat prepared” came out to be 17%. It is possible that some teachers have the knowledge and perception but may not implement multisensory learning strategies in their classrooms or could be working with upper grade students where they focus on preparing students for college.

Sixty-six percent of the teachers were “prepared.” This could be due to these teachers taking college courses in multisensory strategies, having experience with multisensory strategies throughout the years or may have received professional development. Twenty percent came out to be very “well prepared.” This result may highlight teachers that have continued their education and deepened their knowledge and perception of multisensory learning strategies. It may also be due to many years of teaching experience implementing this strategy in their classroom.

### **Limitations**

This study has generated information that can contribute to further research in the areas of multisensory learning strategies in the classroom. Several limitations exist as well. It is important to note that this study was conducted in one district in the United States. The information from the survey can be used to generalize information about teachers' knowledge, perception, and implementation of multisensory learning strategies. Extending this study to

different districts in different locations of the United States could enhance the results and yield more significant data.

Teachers in this study were not interviewed about their knowledge, perception, and implementation of multisensory learning. All the information obtained was fully from the teachers' self-reporting through the survey. Teachers were not observed to see how they implemented multisensory learning strategies in the classroom. Interviews and observation data collection methods could yield different results.

### **Implications**

Results of this study have several implications for education. It appears that teachers between 51-above need to deepen their knowledge in new teaching strategies like multisensory learning strategies that would promote student learning. Consistent professional development can allow teachers who are 51 years old and above to stay up to date with the modern technology that promotes multisensory learning strategies.

Teachers between 21-40 years of age were most likely to have a positive perception of multisensory learning strategy compared to teachers 41 years and above. This information implies that 21-40 years of age teachers are being more exposed to multisensory learning strategies and believe that multisensory learning strategies can be beneficial for their students.

Teachers who taught grades pre-k-2nd grade were more likely to implement multisensory learning strategies in the classroom. Teachers who taught grades 6-12 were less likely to implement multisensory learning strategies in the classroom. This finding implies that the higher the grade level the less implementation of multisensory learning strategies. Teachers who teach upper grades can learn and put into practice multisensory learning strategies that would be most effective for the students in their age-related classroom. Many resources are already available in



the classroom, for example, the interactive board and students' Chromebooks where struggling readers can follow along as they listen to audiobooks.

### **Recommendations**

This study addressed the knowledge, perception, and implementation of multisensory reading strategies. The results of this study used only one district, limiting the study's generalizability to other settings. Expanding the research where the sample size is larger could result in a more generalizable study. This expansion would allow researchers to have a better understanding of the knowledge and perception of ESL/Bilingual teachers and special education teachers who are expected to implement multisensory learning strategies to support student learning.

More training and professional development in multisensory learning strategies for teachers 41 years and above is needed. Training in using instructional technologies in the classroom can benefit teachers in this age group. More professional development is needed for teachers who teach middle grades. Exposing middle grade educators to multisensory strategies techniques and training them in using the resources they already have could be very beneficial to them.

### **Conclusion**

The purpose of this study was to examine the knowledge, perception, and implementation of multisensory reading strategies. While limitations existed in this study, findings showed a need for more professional development for teachers to build their depth of knowledge, perception, and implementation of multisensory learning strategies. The findings showed the need for more support for teachers who are over 51 years of age in their knowledge and perception of this important educational tool. Findings also demonstrated that middle school

teachers also needed more support and professional development in the implementation of multisensory learning strategy. Future research should be conducted to better understand teachers' knowledge, perception, and implementation of multisensory learning strategies.

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