HOW DO MULTISENSORY TEACHING STRATEGIES ENHANCE LITERACY SKILLS AMONG STUDENTS WITH LEARNING DISABILITIES IN INCLUSIVE CLASSROOMS?

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ABSTRACT

This article reviews the efficacy of multisensory teaching strategies in enhancing literacy skills among students with learning disabilities within inclusive classrooms. Multisensory strategies incorporate visual, auditory, and kinesthetic-tactile elements to address students' diverse needs, including native (L1) and non-native English speakers (L2). Research studies conducted by Taghvayi, Vaziri and Kashani (2012, pp. 1264-1269) and Sarudin, Hashim and Yunus (2019, pp. 3186-3194) have demonstrated the substantial benefits of integrating sensory pathways to improve reading accuracy, comprehension, and engagement in learning. Further research highlights the significant role of technology, such as iPads, in personalizing and enhancing the learning experience to better cater to individual student needs. The article also emphasizes the importance of training teachers in multisensory strategies to ensure effective implementation and to support an inclusive educational environment. Ultimately, it is suggested that multisensory teaching strategies not only make learning more accessible but also significantly improve literacy outcomes for students with learning disabilities, thereby fostering a more inclusive and effective educational setting.

Keywords: Multisensory, Students with Learning Disabilities, Literacy Skills, Inclusive Classroom.

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INTRODUCTION

This literature review explores and analyses the effectiveness of multisensory teaching strategies that incorporate visual, auditory, and kinesthetic learning styles specifically tailored to support students with learning disabilities within an inclusive classroom, both native (L1 learners) and non-native English speakers (L2 learners). According to Campbell, Helf and Cooke (2008, pp. 267-295), multisensory teaching strategies involve "visual, auditory, and kinesthetic-tactile strategies used simultaneously to enhance learning." In practice, for instance, multisensory teaching strategies can take several forms, such as during alphabet lessons where children see a letter on a card, trace or write the letter in sand with their fingers, and simultaneously hear and repeat the letter's sound. This approach involves using the visual modality to observe the letter, the tactile modality to physically write it, and the auditory modality to listen to and articulate the letter's name or sound. As another example, when instructing children on letter sounds, teachers can employ various modalities to depict the letter while encouraging students to vocalize the sound, such as jumping while saying J for /j/ (Park, 2022, p. 13).

In contemporary educational settings, there is a growing awareness of the challenges faced by students with reading difficulties, particularly those with learning disabilities (Viji & Raja, 2017, pp. 57-63). Taghvayi, Vaziri and Kashani (2012, pp. 1264-1269) assert that learning disabilities represent a broad category of learning challenges that do not reflect a lack of intelligence but involve disruptions in reading accuracy, speed, or comprehension, impacting academic performance or everyday activities. In inclusive primary schools, where classrooms accommodate students of varying abilities, teachers encounter frequent cases of students struggling with literacy skills (Komalasari, Pamungkas, Wihaskoro, Jana, Bahrum & Khairunnisa, 2019). These teachers should have the necessary knowledge and skills to support all learners effectively. Newman (2019, pp. 12-16) suggests that inclusive education aims to provide equal learning opportunities to students with diverse needs, including those with reading disabilities. Despite their cognitive capabilities, these students, both L1 and L2 learners, may often feel marginalized in language classes, particularly when learning to read. Recognizing these students' unique challenges is crucial for educators to tailor effective instructional strategies. One promising approach is using multisensory teaching strategies inputs to enhance learning outcomes, catering to diverse learner preferences and needs (Kamenopoulou, 2022, pp. 59-63). This literature review explores the impact of multisensory learning strategies on literacy skills among students with

learning disabilities in inclusive classrooms, emphasizing the significance and effectiveness of these methods.

LITERATURE REVIEW

Multisensory teaching strategies employ sensory pathways—visual, auditory, kinesthetic, and tactile—to enhance learning experiences and improve educational outcomes for students with learning disabilities. Sarudin, Hashim and Yunus (2019, pp. 3186-3194) explained that multisensory teaching strategies utilize various human senses, such as visual (what we see), auditory (what we hear), kinesthetic, and tactile (what we touch or feel), to facilitate learning. These strategies promote learning engagement by allowing learners to experience and absorb information through multiple sensory pathways. Similarly, Taghvayi, Vaziri and Kashani (2012, pp. 1264-1269) stated that multisensory teaching strategies effectively improve reading skills in students with learning disabilities. Their study compared the effectiveness of an integrative approach with the Fernald multisensory method in reducing reading disabilities in elementary students. The study involved 30 students who received treatments across 12 sessions, and they were assessed using the Reading Level Test. The findings demonstrated that the integrated approach, which includes the multisensory method, among other strategies, was significantly more effective than the Fernald method alone in improving reading accuracy, comprehension, and phonemics. The study suggests that a multifaceted approach, which integrates various sensory inputs and educational strategies, can address the diverse needs of students with reading disabilities more effectively than methods focusing on a single type of sensory input. Likewise, Sarudin, Hashim and Yunus (2019, pp. 3186-3194) revealed that the multisensory approach significantly enhances word recognition in learners, facilitating improved reading skills. They further argue that this approach also enhances learners with learning difficulties in multiple areas, such as spelling, reading, writing, and listening comprehension.

In an L2 context, Hettiarachchi and Ranaweera (2013, pp. 1076-1081) studied multisensory storytelling to enhance vocabulary development in children with language-learning difficulties. In their study, 30 children with language-learning difficulties participated in a 3 month program involving weekly multisensory storytelling sessions, which included local traditional stories integrated with visual, auditory, and tactile stimuli. Receptive and expressive vocabulary assessments were carried out before and after the intervention. The findings showed a statistically significant improvement in both receptive and expressive vocabulary following the storytelling

sessions. This research illustrates that the multisensory teaching strategies facilitated deeper engagement and learning by utilizing various senses, which helped reinforce the children's understanding and use of new vocabulary. Integrating familiar cultural stories further supported learning by making the content more relatable and more accessible to recall, enhancing both memory and comprehension. Milman and Vanden Boogart (2024, pp. 1-19) conducted a study using iPads to differentiate reading and writing instruction in elementary education, offering tailored learning experiences across content areas. They explored the integration of iPads in a Pre-K to 4th grade classroom within a 1:1 iPad initiative environment. The researchers documented how iPads were used for reading and writing instruction through mixed methods research, including interviews, observations, and surveys. The findings highlight how iPads facilitated varied instructional strategies, enhanced student engagement, and allowed for personalization of the learning process, thereby supporting differentiated instruction across different content areas. The study found that using iPads allows opportunities to adjust the complexity of tasks according to individual student needs, engage students in interactive and engaging learning experiences, and offer instant feedback. This customization is crucial for addressing the varied learning styles and paces in a classroom, making education more inclusive and effective (Muvirimi, 2018, p. 64).

Regarding multisensory teaching strategies for students with learning disabilities such as dyslexia, Boardman (2019, pp. 795-806) investigated a study with 213 teachers from England participating in the Specialist Dyslexia Training Programme, which emphasized multisensory teaching strategies. Through surveys, interviews, and focus groups, the research found that these strategies significantly enhanced the teachers' ability to effectively implement methods that integrate visual, auditory, kinesthetic, and tactile learning experiences. This approach notably improved engagement and learning outcomes for students with dyslexia and highlighted the essential role of ongoing professional development in multisensory methods. The findings advocate for the inclusion of multisensory strategies in teacher training and development programs to support a diverse student body and promote inclusive educational practices globally.

Another study that used multisensory teaching strategies to improve reading skills in young English learners was conducted by Celik and Karatepe (2018, pp. 80-95). The population of their study were two groups of 4th graders: a control group taught through traditional methods, and an experimental group taught using multisensory language teaching (MSLT) for six weeks. The study utilized a 24-item reading achievement test administered before and after the

intervention. The results showed no initial differences in reading skills between the groups; however, significant improvements were noted in the experimental group's post and delayed post-test scores, indicating enhanced reading abilities. The researchers indicated that this method helps solidify the learning content by appealing to various senses, facilitating a more profound understanding and retention of the material taught, effectively enhancing young learners' reading competencies. Such approaches can transform traditional learning environments into more dynamic and inclusive spaces.

Komalasari et al. (2019) investigated the implementation of interactive multimedia based on multisensory methods (auditory, visual, kinesthetic, tactile) to teach students with learning difficulties. The strategies were applied in a classroom setting, and the changes in students' abilities to learn basic skills like reading and writing were observed. The results showed significant improvements in these skills among students taught using the multisensory multimedia approach compared to those who did not. This method helps better retention and understanding of the content because it stimulates multiple senses that reinforce learning pathways in the brain, making the educational experience more effective and engaging for students with learning difficulties.

Another example of research conducted by Lee (2016, pp. 1019-1034) suggested that multisensory modalities, whether through traditional letter cards or iPad interfaces, significantly enhance early reading skills like blending and segmenting in young bilingual readers. In her study, 56 high- and low-ability bilingual (Malay-English) Grade 2 students participated in a quasi-experimental post-test study to examine the effectiveness of multisensory modalities (letter cards and iPads) on phonological tasks such as blending and segmenting non-words. The results indicated no significant difference between the two modalities' impact on the phonological tasks, suggesting they are equally effective. This research suggests that the effectiveness of multisensory approaches in reading instruction is not contingent on the medium (traditional vs. digital) but on the presence of multisensory components. Both modalities effectively employ tactile-kinesthetic movements, albeit in different forms (gross motor skills with letter cards and fine motor skills with iPads), supporting phonological reading processing.

DISCUSSION AND ANALYSIS

The following section provides an in-depth discussion and analysis of five key elements of multisensory teaching strategies including 1) the effectiveness of multisensory teaching strategies; 2) specific impacts on literacy skills; 3) the role of technology in multisensory learning; 4) training teachers in multisensory strategies; 5) the comparative effectiveness of multisensory modalities.

Effectiveness of Multisensory Teaching Strategies

Multisensory teaching strategies enhance literacy skills among students with learning disabilities by engaging multiple sensory pathways in inclusive classrooms. As Campbell, Helf and Cooke (2008, pp. 267-295) suggest, simultaneously employing visual, auditory, and kinesthetic-tactile strategies can significantly enhance the learning experience, particularly for students who might struggle with conventional teaching methods due to their learning disabilities. This approach can lead to a more inclusive and effective educational environment, accommodating students' varied learning styles. Sarudin, Hashim and Yunus (2019, pp. 3186-3194) emphasize the value of engaging learners through multiple senses, which helps them absorb information more effectively. The integration of these sensory inputs does not just cater to different learning preferences but also addresses the diverse needs of students, making learning more accessible and enjoyable. It is essential in inclusive settings where students with disabilities often require different approaches to learning that traditional strategies may not provide.

Specific Impacts on Literacy Skills

Studies have shown that multisensory teaching methods can significantly improve literacy skills. Taghvayi, Vaziri and Kashani (2012, pp. 1264-1269) found that an integrated approach involving multisensory methods improved reading skills in elementary students with learning disabilities more effectively than traditional methods. The investigation suggests multisensory teaching strategies are more engaging and effective in building literacy skills. In the L2 context, Hettiarachchi and Ranaweera (2013, pp. 1076-1081) demonstrated that multisensory storytelling could significantly enhance vocabulary development. This method makes educational content more relatable and memorable, crucial for language acquisition and literacy development. By incorporating local cultural stories with visual, auditory, and tactile elements, learning becomes a richer and more engaging experience that supports literacy development.

Role of Technology in Multisensory Learning

The use of technology, such as iPads, has further enhanced the capability to personalize learning experiences, tailoring to students' individual needs. Milman and Vanden Boogart (2024, pp. 1-19) illustrated how iPads could facilitate personalized reading and writing instructions, increasing engagement and personalizing learning. Muvirimi (2018, p. 64) supports this view, suggesting that technology allows for the adjustment of task complexity based on individual learner needs and provides interactive experiences crucial for inclusive education.

Training Teachers in Multisensory Strategies

The training of teachers in multisensory strategies is vital for the effective implementation of these methods. Boardman (2019, pp. 795-806) highlighted the importance of such training through a study that found significant improvements in the capabilities of teachers to implement multisensory strategies after undertaking a Specialist Dyslexia Training Programme. The researcher indicates that such strategies improve engagement and learning outcomes for students with dyslexia, advocating for the inclusion of multisensory strategies in teacher training programs to enhance inclusive educational practices.

Comparative Effectiveness of Multisensory Modalities

Both traditional and digital multisensory modalities are effective. Lee (2016, pp. 1019-1034) found that traditional (letter cards) and digital tools (iPads) were equally effective in enhancing phonological tasks like blending and segmenting among bilingual readers. The effectiveness of multisensory approaches is contingent not on the medium but on the presence of multisensory components. Both modalities effectively employ tactile-kinesthetic movements, supporting phonological processing in reading.

CONCLUSION

In conclusion, the literature revealed that multisensory teaching strategies significantly enhance literacy skills in students with learning disabilities within inclusive classrooms. These strategies, which integrate visual, auditory, and kinesthetic-tactile elements, cater to diverse learning preferences and address the specific educational needs of students who struggle with traditional learning methods. Research supports the value of multisensory approaches, showing that they improve literacy skills more effectively than conventional methods. Furthermore, using technology, like iPads, enriches these learning environments, providing personalized, interactive experiences that boost student engagement and motivation. Training teachers in

multisensory strategies is essential for effectively supporting all students and ensuring an inclusive educational atmosphere. Ultimately, multisensory teaching strategies not only make learning more accessible but also transform educational environments into dynamic, inclusive spaces that empower students with learning disabilities to achieve their full literacy potential.

RECOMMENDATION

Future research could focus on several key areas to expand the understanding of multisensory teaching strategies for students with learning disabilities. One important direction is to investigate the long-term impact of multisensory strategies on literacy development beyond primary education. This would help determine whether the benefits of multisensory learning are sustained over time and whether they contribute to improved academic performance and literacy skills in secondary education or beyond.

Another interesting area to explore is the effectiveness of multisensory strategies in addressing different types of learning disabilities, such as dyslexia, ADHD, or language-based learning disabilities. Conducting studies that examine how specific sensory inputs (visual, auditory, kinesthetic-tactile) impact different disabilities could help educators tailor interventions more effectively to individual student needs.

REFERENCES

Boardman, K. (2020). An exploration of teachers' perceptions and the value of multisensory teaching and learning: a perspective on the influence of Specialist Dyslexia Training in England. ***Education 3-13***, ***48***(7), pp. 795-806. https://doi.org/10.1080/03004279.2019.1653349

Campbell, M. L., Helf, S. & Cooke, N. L. (2008). Effects of adding multisensory components to a supplemental reading program on the decoding skills of treatment resisters. ***Education and Treatment of Children***, ***31***(3), pp. 267-295.

Celik Korkmaz, S. & Karatepe, C. (2018). The Impact of Multi-Sensory Language Teaching on Young English Learners' Achievement in Reading Skills. ***Novitas-ROYAL (Research on Youth and Language)***, ***12***(2), pp. 80-95.

Hettiarachchi, S. & Ranaweera, M. (2013). Story Boxes: using a multisensory story approach to develop vocabulary in children experiencing language-learning difficulties. ***International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)***, ***4***(1), pp. 1076-1081. https://doi.org/10.20533/ijcdse.2042.6364.2013.0152

Kamenopoulou, L. (2022). ***Inclusive education for learners with multisensory impairment: best practices and research priorities***. New York, NY: McGraw-Hill.

Komalasari, M. D., Pamungkas, B., Wihaskoro, A. M., Jana, P., Bahrum, A. & Khairunnisa, N. Z. (2019). Interactive multimedia based on multisensory as a model of inclusive education for student with learning difficulties. ***In Journal of Physics: Conference Series***, ***1254***(1), 012057. https://doi.org/10.1088/1742-6596/1254/1/012057

Lee, L. W. (2016). Multisensory modalities for blending and segmenting among early readers. **Computer Assisted Language Learning**, ***29***(5), pp. 1019-1034. https://doi.org/10.1080/09588221.2015.1129347

Milman, N. B. & Vanden Boogart, A. E. (2024). Differentiating Reading and Writing Instruction Across Content Areas With 1: 1 iPads in an Elementary School. ***Computers in the Schools***, pp. 1-19. https://doi.org/10.1080/07380569.2024.2337649

Muvirimi, P. (2018). Chapter Four: Multisensory approach. ***Learning to Teach in an Inclusive Era: Methods of Teaching***. New York, NY: Strategic Book Publishing.

Newman, I. (2019). When saying ‘go read it again’won't work: Multisensory ideas for more inclusive teaching & learning. ***Nurse education in practice***, ***34***, pp. 12-16.

Park, S. (2022). ***Multisensory Alphabet Instruction for Young Children***. Columbus, Ohio: The Ohio State University.

Sarudin, N. A. A., Hashim, H. & Yunus, M. M. (2019). Multi-sensory approach: How it helps in improving words recognition?. ***Creative Education***, ***10***(12), pp. 3186-3194. https://doi.org/10.4236/ce.2019.1012242

Taghvayi, D., Vaziri, S. & Kashani, F. L. (2012). The effectiveness of integrative approach, Fernald multi-sensory technique on decrease reading disability. ***Procedia-Social and Behavioral Sciences***, **69**, pp. 1264-1269. https://doi.org/10.1016/j.sbspro.2012.12.060

Viji, B. & Raja, B. W. D. (2017). Preparing Teachers for Multisensory Teaching Strategy to Improve the Learning Outcomes of Students with Reading Disabilities. ***TJELLS| The Journal for English Language and Literary Studies***, ***7***(4), pp. 57-63. https://brbs.tjells.com/index.php/tjells/article/view/220