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TITLE: Building Phonological Foundations Through Multisensory Play: A Proposed Early Intervention Scenario for Preschoolers at Risk for Dyslexia

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ABSTRACT

This study introduces a hands-on approach that uses sensory-rich games to support young children in Greek kindergartens who may be facing dyslinguistic challenges. The focus is on how movement, sounds and visuals can help these children to learn. The ability to recognize and work with speech sounds, such as identifying rhymes or breaking words down into smaller parts, is considered essential for future reading success. Rather than drills, the method uses fun physical interaction to encourage children to explore language in a joyful way. It is designed to build confidence when dealing with word sounds and spark a genuine interest in stories and books, while also honoring each child's unique learning style. The goal? To level the playing field from the outset by catering to different needs through inclusive, active experiences. A group of five to seven young children, aged around 4.5 to 5.5 years, who are showing early signs of difficulty with reading or who have a family history of dyslexia, take part in this program. Over eight weeks, they meet twice a week for half-hour activities, making 16 meetings in total. Rather than costly equipment, the program uses low-cost, hands-on materials such as bumpy letter shapes, sound blocks and action-filled games that build listening skills through fun, relaxed interaction. Each session follows the same structure: starting off with lively, beat-driven rhymes, then moving on to free discovery using touch-and-sound toys. This is followed by focused lessons where the senses are combined with learning tools and shared exercises based on playful teamwork tasks. The session ends with a warm check-in about what stood out. To track progress, a custom-made checklist with yes-or-no answers is used to measure eight key areas related to hearing differences in sounds. Short, 10-minute, game-style tests are given at the start (T1) and end (T2) of the study, and scores are based on the number of items answered correctly. Inter-rater consistency is targeted at around 90%, and this is supported by narrative summaries and observational notes about how children engage and what they prefer. The study adheres to ethical guidelines, including approval from an institutional board and written permission from parents. Young participants' agreement is also obtained through picture-based options, ensuring that the methods respect the children's needs and developmental stage. Expected results: Based on similar reading programs that use sight, sound and touch, children should improve their ability to recognize speech sounds by between a third and three-quarters by the end of the program, provided that it is followed closely. At the same time, they are likely to persist with tasks for longer and show more interest in reading activities. This playful, hands-on approach provides kindergarten teachers with a practical method of developing early sound skills, helping at-risk young children to avoid later reading difficulties and boosting their confidence in learning to read. It aligns with research

demonstrating that utilizing multiple senses and intervening early can significantly impact children in need of additional support, proving their effectiveness in various preschool settings. The model advocates wider implementation to enhance readiness and coping skills, suggesting adjustments based on the environment to enable more children to benefit from a stronger foundation in reading.

INTRODUCTION

Dyslexia is a brain-based learning difference, characterised by persistent difficulties with reading and spelling despite strong thinking skills and clear lessons. This is primarily due to weak speech sound processing (Peterson & Pennington, 2015, p. 284, para. 2; Snowling, Hulme & Nation, 2020, p. 501, para. 1). Research from around the world shows that dyslexia affects roughly 5–17% of people, regardless of their language. This highlights the importance of acting early to change learning paths before difficulties become entrenched (Peterson & Pennington, 2015, p. 286, par. 2). In younger children just starting school, those leaning towards dyslexia often exhibit subtle signs such as difficulty identifying rhymes or breaking words into syllables. Conversely, they may excel in visualising the big picture or solving spatial puzzles (Winner et al., 2001, p. 82, para. 1–5; Von Károlyi et al., 2003, p. 428, par. 5). Being aware of sounds in spoken words is key to later reading success as it helps children realise that speech is not one smooth flow but is made up of separate bits that can be pulled apart, stuck together again and rearranged, thus linking what they hear to written letters (National Reading Panel, 2000, p. 28, par. 3). Young children at risk of dyslexia fare better when playful, focused support builds their early listening skills. This helps them avoid bigger struggles later on by turning potential hurdles into opportunities for confident reading (National Reading Panel, 2000, p. 37, par. 3). By focusing on these abilities before school starts and while children's brains are most flexible, teachers can create moments that build key foundations as well as positive feelings about books, leading to stronger effort and success with learning to read.

Multisensory teaching involves stimulating sight, hearing, touch and movement simultaneously, which aligns with the way brains naturally learn and processes information (Campbell et al., 2011, p. 270, par. 2). Rather than following just one path, this approach establishes multiple brain connections: children see letters, hear sounds and feel textured shapes while moving their hands or bodies. This helps them to remember and recall information more effectively (Birsh, 2011, p. 25, fig. 1.4). These mixed methods are important for preventing dyslexia because they bypass weaknesses in single-sensory learning, using multiple strengths to develop robust sound knowledge that supports later success in reading.

Research shows that early playful sound activities can greatly benefit children who are struggling. Studies on hands-on learning methods reveal that young children enjoy combining senses during listening exercises, particularly when moving while learning, which yields quick results (Piasta & Wagner, 2010, p. 11, para. 2). At the same time,

exploring enjoyable ways of distinguishing between sounds using sight, touch and hearing improves understanding of letters and their sounds, particularly when lessons feel like games that maintain attention (Lonigan et al., 2013, p. 121, par. 2). This work proves that combining senses builds stronger skills, leading to clearer reading success and a more positive attitude towards books. Nevertheless, easy-to-use analogue tools that incorporate these sensory concepts into daily preschool play are difficult to find, despite the fact that teachers in underfunded areas such as Greek kindergartens continue to advocate for early support.

This study proposes a new approach to using playful, hands-on activities in a Greek preschool setting, with the aim of helping children at risk of dyslexia to develop listening skills related to reading. It is intended to provide teachers with a practical tool that boosts morale while capitalising on the movement-based and creative strengths of young learners, drawing them into enjoyable, sound-focused activities that promote early literacy development. This approach is effective because it aligns with the way young children naturally learn — through touch, movement, and hands-on experience — and provides a cost-effective model that transforms everyday moments into opportunities for developing essential skills. Rather than adhering to quiet, abstract exercises that are not suited to young children, this approach relies on real-life experiences, physical activity and playful practice, encouraging independent discovery and positive associations with words that are appropriate to their stage of life. Teachers guide pupils step by step through increasingly complex listening games, starting with fun noise-making play and building towards more detailed work with speech sounds. Progress is checked by highlighting individual gains and celebrating new talents, which shapes ongoing improvements.

METHOD

Nature of This Proposal

This paper describes a teaching plan designed for use in kindergartens soon, to help young children who may struggle with reading later on. The methods, steps and progress-checking procedures form a solid learning design based on the use of multiple senses, although it has not yet been tested. The expected outcomes are based on similar past efforts focused on early sound skills, as evidenced by current studies. The next step is to implement this plan and confirm its effectiveness.

Participants and setting

The programme focuses on children aged 4.5 to 5.5 years old who are in preschool and show early signs of difficulty with reading, such as a family history of dyslexia, delayed speech, difficulty with rhyming or forgetting letters even after practising. The programme is designed for children who enjoy hands-on activities and respond well to

movement-based tasks. It aims to build on their strengths while addressing their weaknesses, provided that parents are involved and give permission. This fosters a sense of teamwork between home and school. These children often have strong visual-spatial skills, think up original solutions and see the big picture – a trait that we will respect and develop through this programme. The setting is designed to feel warm and inviting, with a flexible layout featuring movable chairs and ample space for movement. This setup allows for easy access to supplies, facilitating smoother transitions and maintaining sustained attention. Sessions fit naturally into daily routines and are guided by teachers and sometimes counsellors, focusing on gentle support instead of control. Rules are based on approval from oversight groups and children agree to them through pictures. For example, they can join 'listening games'. Data is kept safe and families talk openly to maintain honesty and respect.

Proposed Teaching Procedures: The Multisensory Play-Based Scenario

Over the course of two months, children meet every few days for short thirty-minute sessions, adding up to sixteen in total, to gradually progress from rhyming sounds to individual speech. Instead of plain letters, they use tactile alphabets and jars filled with noisemakers, moving toys and eye-catching sorting pictures. Designed for those who learn by doing or listening closely, each session begins with beat-driven movement songs to get everyone going. It concludes with group cheers to ensure positive feelings persist and maintain their enthusiasm to return.

Teachers refer to phonological awareness as 'playing with sounds', enabling children to learn through games that develop strong reading skills. The lesson unfolds step by step: start-off (5 minutes), dig-in time (10 minutes), teach-back (8 minutes), try-it-out (5 minutes), wrap-up (2 minutes), with teachers showing excitement and providing hands-on assistance and encouragement to boost confidence. The steps progress from larger tasks, such as clapping syllables or spotting rhymes, to smaller tasks, such as identifying initial sounds or individual letters, with progress being highlighted along the way.

- Weeks 1–2: Focus on syllables and spotting rhymes. Begin by tapping out the beats of names as children throw a soft ball, for example two taps for 'Sa-mi', linking movement with breaking sounds apart (Piasta & Wagner, 2010, p. 1, para. 3). Tools needed: Soft ball. Outcome: steady rhythm growth. Next, sort items into groups based on how their chunks sound, placing them onto colour-coded mats to combine touch and sight (Campbell et al., 2011, p. 1, par. 2). Supplies: Small items and coloured mats. The result is an improvement in accuracy over time. Demonstrate how words rhyme using pictures that illustrate how sounds feel in the mouth, such as the 'dog-fog-log' ending echoes, with cues for touching the mouth. Use picture cards and ask the children to copy or name the matches. Play 'rhyme toss', only tossing the ball after giving a rhyming word and starting with hints. Provide small bags containing prompts and gradually shift the answers from guided to independent. Finish with hand signs

for the top picks and call them 'sound detectives'. Children respond with enthusiastic gestures.

- Weeks 3–4: Start with movements tied to sounds, such as hopping for /h/, to build body-memory links. Use picture cues and encourage the children to react with made-up gestures. Next, pair letter magnets with pictures and mix touch and hearing tasks. Supplies: Magnetic letters. Outcomes: Guided sorting practice. Split the items by the first sound and focus on how the mouth moves ("Say /p/ and pucker your lips"). Use trays with sections and let the children try sorting alone. Pair up, draw cards and guess the starting sounds together, helping each other out. Grab the drawstring bags and work as a team. End loudly – shout the sound and exaggerate it; respond quickly and enthusiastically.
- Weeks 5–6: Start mixing and breaking down sounds. Try creating robotic speech by linking chopped word parts step by step. Result? You've got it right when you join the sounds. Next, move markers across the sound maps of words to turn vague ideas into something tangible. What you need: charts and tokens. Outcome: You will learn how to split sounds apart. Teach this way: connect or break down using pictures and rough surfaces; run your fingers along the shape of each sound. Tools used: bumpy letter sets. Feedback: Followed the lines fine. Try dropping items when you hear sounds – use containers to help. You'll need some bins. What happens next? You can fix things yourself. Finish by breaking words apart and clapping for each attempt. People jump in quickly and are happy to show what they can do.
- Weeks 7–8: Play with sounds and swap them around. Start off by changing the letters in songs, such as turning 'Twinkle' into 'Swinkle'. Use charts to help and get the kids to answer by making up silly versions. Try moving tiles around to change words – turn 'mat' into 'bat' – to see how small changes create new words. Grab the letter tiles – the reactions are full of fun surprises! Show how taking away or switching a sound works using hands-on swaps and drops. Stuff: Groups and answers: how sounds hit differently. Try this: one person gives hints and the other tweaks the noises together. Stuff: Word rows; answers: figure it out side by side. Wrap-up: Shine on your progress using stars. Stuff: Graphs; answers: feeling good about what's been achieved.

Changes include flexible pacing, added images and different replies, which are checked by 90% lists to maintain quality. Teachers can adjust using feedback to ensure that everyone does well and stays engaged.

Proposed Assessment

Thanks to a custom plan made just for this research, testing will highlight how children improve in spotting speech sounds through fun activities that are closely observed. As there is no proper Greek version of standard tests that fit real-life preschool settings, we will compile a short list of eight yes-or-no questions based on reliable models (Lonigan et al., 2013, p. 118, para. 3), adapting them so that they can be used during playful moments in Greek early years classrooms. The questions cover four skill areas evenly: noticing and making rhymes (two questions, e.g. 'Can they spot matching rhymes?'), breaking words into chunks (two questions, e.g. 'Do they clap out word parts

correctly?'), picking out single sounds (two questions, e.g. 'Do they find the first sound correctly?'), and linking sounds together (two questions, e.g. 'Do they join sounds into full words?'). Information is gathered via ten-minute play sessions before and after help steps are provided (T1 and T2), where speaking challenges are naturally incorporated into games – for example, tossing balls by rhyme or sorting toys by sound. Participants watched video clips individually, working out how often tasks were completed correctly from a list of eight items. When comparing notes, they aimed to match up about nine times out of ten – sometimes as low as 85%, but never dropping below that or going above 95%.

Qualitative records track methods, unplanned uses and emotional responses to add real-world context. Reviews are conducted using basic statistics in Excel or SPSS, such as means, spreads and shifts, focusing on trends rather than reasons based on the rating scale.

Projected Outcomes Based on Comparable Interventions

Studies into how young children at risk of dyslexia respond to learning through multiple senses help to shape our expectations of the results. Rather than using traditional drills, digital tools designed for children who struggle with reading demonstrate that all children can complete exercises such as matching letters to sounds and blending words, although some find it more challenging (Kazakou et al., 2011, p. 47, para. 2). When researchers pooled data from many studies, they found that weak readers improved at identifying sound patterns, particularly after training, with significant progress from initial to final stages (Troike & Ehren, 2022, p. 1043, Table 3). Children with delayed speech or difficulty forming sentences also made progress during early literacy interventions; those who received targeted instruction outperformed others in tests involving rhymes, such as identifying, creating and sorting them. However, responses varied widely and not all children reached average levels (Gillam & Gillam, 2016, p. 225, par. 1). If this hands-on play method is implemented as planned, similar improvements should occur: basic skills such as identifying rhymes could improve significantly thanks to rhythm-based movement games, whereas more challenging tasks such as manipulating tiny bits of sound may progress more slowly. However, how each person reacts can vary greatly depending on the severity of their initial sound difficulties, whether they have difficulty pronouncing words clearly, and the type of reading support they receive at home, which is also linked to how well they respond to touch-based, movement-focused, or listening-driven methods. These forecasts are based on programmes with similar designs; however, real proof requires a careful rollout involving video reviews checked by multiple judges (with the aim of achieving 90% agreement), as well as notes on how engaged the children are during tasks, and retesting after three to six months, in order to determine what truly works and which adjustments help learners at risk of dyslexia to improve.

DISCUSSION

This playful, hands-on approach helps young children at risk of dyslexia to develop strong skills from an early age. It is supported by research showing that fun, clear teaching is the most effective (Kazakou et al., 2011, p. 33, para. 1). Rather than treating learning as a task to be fixed, the method turns it into a lively experience using games that engage sight, sound, touch and movement. It follows how children naturally grow their listening abilities, step by step — from clapping out syllables to shifting individual sounds. Each stage introduces new challenges gradually, combining repetition with intelligent support to ensure children learn effectively without becoming overwhelmed, unlike traditional rote learning methods.

The benefits of this approach extend beyond simply picking up skills. Nowadays, dyslexia is seen less as a reading problem and more as a different way of learning that comes with special thinking strengths. Because of this, the approach makes use of children's hands-on inventiveness, their love of touching and exploring things, and their big-picture awareness to drive how they learn sounds in words (Kazakou et al., 2011, p. 34, para. 4). Seeing ability instead of deficit changes how children view themselves: once they succeed using methods that suit them, reading starts to feel like something they can do well — like fun, not frustration. Research shows that these positive early experiences with books encourage children to continue reading and reduce the likelihood of emotional issues such as anxiety or giving up too soon later in life (Kazakou et al., 2011, p. 34, par. 3).

Because it's cheap and easy to copy, the programme uses simple materials such as bean bags, rough letter shapes or everyday household items, so schools with limited budgets, such as Greek preschools or similar establishments worldwide, can implement it without difficulty. Rather than disrupting daily activities, it seamlessly integrates into regular playtime, leaving lesson plans intact while effectively teaching, which helps overcome a major reason why such programmes often fail to gain traction. On top of that, its adaptable pace, the varied ways in which children respond and the teamwork setup mean that it works just as well for whole classes, not just for small support sessions, which means that every student could benefit, especially those who struggle more.

What makes the idea stand out is that it combines hands-on learning with a playful, step-by-step structure designed specifically for young children — something that most studies don't really combine, since they usually go one way or the other: too rigid or too random without growth (Nurmi et al., 2019, p. 1739, par. 3). Rather than picking sides, this approach incorporates guided teaching into game-like exploration and concludes each session with child-led fun, linking self-driven curiosity to tangible progress. It also reflects local culture by using Greek character names, familiar tunes and items from the local area, which makes teachers feel more connected and helps the programme fit in better wherever it is used.

This study adds to current knowledge by laying out a clear plan you can actually test, filling key holes in what's missing: few fun, game-driven ways to build sound skills early on; too little use of touch-and-sense learning tools outside English-speaking or Northern regions; plus the lack of full-picture tracking that shows both emotions and thinking shifts. Coming experiments ought to focus on random-group setups where kids get different real-world options - one group follows regular school routines, another gets sensory-rich games, a third does basic sound drills - with check-ins after half a year and again at twelve months to see if gains stick and whether reading starts to form. Brain scan side projects might show how combining senses boosts brain wiring for sounds, whereas watching teachers closely could help shape training programs that schools everywhere can adopt. Tweaking this setup for other tongues - especially ones like Greek, where letters match sounds clearly - can reveal if it holds up across different writing systems.

This idea lays out a way to make early reading help fairer, happier, and more useful - seeing dyslexia prevention not as fixing flaws, yet honoring different ways of thinking through fun, sound-based play. Putting it into action could change how kids grow, giving them not only skills for decoding sounds, but also belief in themselves to use those skills all through life.

Implications

Extending domestically, parents adapt for familial bonds and readiness. Universally applicable in mixed groups as prevention, with tech extensions for resourced areas. This works everywhere, especially when people mix, with tools helping areas that have more support.

Limitations and future research

Although the suggested playful, multisensory setup offers a clear, interesting and research-based way to improve the sound skills of young children at risk of dyslexia, there are some drawbacks that require attention. Firstly, it is just an idea so far and hasn't been tested in real life, meaning any expected results are speculative and depend on how well it is actually carried out. The two-month timeline may be too short to establish whether gains persist or carry over into actual reading tasks, particularly for those who struggle more with sounds or have broader speech issues. Additionally, while blending senses can benefit many learners, unique challenges such as being overly sensitive to touch or difficulty distinguishing similar sounds may require adjustments beyond what is currently planned.

The requirement for teachers to lead activities assumes they are comfortable with hands-on teaching methods and can adhere closely to lesson plans, which some may find challenging, suggesting they would benefit from specific training. Rather than

incorporating much written material, such as matching sounds to letters, this approach focuses on spoken sound skills, which is well suited to children aged 4.5 to 5.5 years, although it may leave them less prepared for the reading basics encountered in the first year of school. In conclusion, even though the idea was developed for kindergartens in Greece and is aligned with local culture, it has yet to demonstrate its effectiveness in regions where spelling is more challenging, such as English, or in areas with multiple languages.

Those looking into this later should focus on fair tests that compare sensory-rich play setups with regular preschool lessons, as well as other sound-based methods such as tablet games or pure music activities, to see what works better. Quick results and long-term tracking after six months, one year and two years can be used to judge early reading skills such as recognising letters, sounding out words and fluent reading. One-person trial formats might help to identify personal progress trends and the optimal session frequency, e.g. twice versus three times weekly. Brain scans using wearable infrared technology or electrical brainwave markers could demonstrate how layered senses can strengthen language circuits in children at risk of delays. When testing real-world rollout chances, it is important to check how well teachers stick to the plan through recorded lesson reviews scored by multiple judges, and to include expense-versus-gain breakdowns, especially where cash is tight.

Cross-language adjustments, such as comparing results in clear spelling systems (e.g. Greek and Italian) with those in more complex systems (e.g. English and French), could demonstrate the effectiveness of the setup across different writing styles. Ultimately, trialling parent-led versions of certain tasks (e.g. playing word games at home using everyday items) could reveal their feasibility and help to enhance learning while encouraging families to read together more frequently. Investigating this would not only support today's idea, but also provide real-world evidence of enjoyable, fair and practical methods for identifying dyslexia in young children earlier.

References

Birsh, J. R. (Ed.). (2018). Multisensory teaching of basic language skills (4th ed.). Brookes Publishing.

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, 34(3), 267–295. https://doi.org/10.1353/etc.0.0003

Gillam, R. B., & Gillam, S. L. (2016). Narrative intervention for children with language impairment. In R. J. McCauley, M. E. Fey, & R. Gillam (Eds.), Treatment of language disorders in children (2nd ed., pp. 459–490). Brookes Publishing.

Kazakou, M., Soulis, S., Morfidi, E., & Mikropoulos, T. A. (2011). Phonological awareness software for dyslexic children. Themes in Science and Technology Education, 4(1), 33–51. https://eric.ed.gov/?id=EJ1131287

Ledford, J. R., & Gast, D. L. (2018). Single case research methodology: Applications in special education and behavioral sciences (3rd ed., pp. 115–117). Routledge. https://doi.org/10.4324/9781315150666

Lonigan, C. J., Purpura, D. J., Wilson, S. B., Walker, P. M., & Clancy-Menchetti, J. (2013). Evaluating the components of an emergent literacy intervention for preschool children at risk for reading difficulties. Journal of Experimental Child Psychology, 114(1), 111–130. https://doi.org/10.1016/j.jecp.2012.08.010

National Reading Panel. (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. National Institute of Child Health and Human Development.

Nurmi, J.E., Aunola, K., Salmela-Aro, K. et al. (2019). The role of reading difficulties in the associations between task values, efficacy beliefs, and achievement emotions. Reading and Writing, 32, 1343–1371. DOI: https://doi.org/10.1007/s11145-018-9922-x

Peterson, R. L., & Pennington, B. F. (2015). Developmental dyslexia. Annual Review of Clinical Psychology, 11, 283–307. 15) https://doi.org/10.1146/annurev-clinpsy-032814-112842

Piasta, S. B., & Wagner, R. K. (2010). Developing early literacy skills: A meta-analysis of alphabet learning and instruction. Reading Research Quarterly, 45(1), 8–38. https://doi.org/10.1598/RRQ.45.1.2

Snowling, M. J., Hulme, C., & Nation, K. (2020). Defining and understanding dyslexia: Past, present and future. Oxford Review of Education, 46(4), 501–513. https://doi.org/10.1080/03054985.2020.1765756

Troike, R. C., & Ehren, B. J. (2022). A meta-analysis of phonemic awareness instruction provided to children suspected of having a reading disability. Language, Speech, and Hearing Services in Schools, 53(4), 1034–1052. https://doi.org/10.1044/2022_LSHSS-21-00160

Von Károlyi, C., Winner, E., Gray, W., & Sherman, G. F. (2003). Dyslexia linked to talent: Global visual-spatial ability. Brain and Language, 85(3), 427–431. https://doi.org/10.1016/S0093-934X(03)00052-X

Winner, E., von Károlyi, C., Malinsky, D., French, L., Seliger, C., Ross, E., & Weber, C. (2001). Dyslexia and visual-spatial talents: Compensation vs deficit model. Annals of Dyslexia, 51(1), 103–126. https://doi.org/10.1007/s11881-001-0008-1