

Utilizing Traditional Game-Pallanguzhi as a tool to Enhance the Basic Arithmetic Skill of Children with Mathematical Difficulties

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Abstract

Early childhood is a critical time for children to develop the fundamental mathematical thinking and knowledge needed for excellence in education and employment in the future. The comprehension of numerical concepts is a crucial mathematical skill to cultivate in the early stages of childhood. This understanding lays the groundwork for children to master formal mathematics and achieve life-changing mathematical skills. Children diagnosed with mathematical difficulties experience challenges when it comes to acquiring and applying fundamental arithmetic skills in their daily lives. The conventional instructional approach fails to address the specific requirements of this particular group of students. There exists a need for the implementation of a pedagogical approach that incorporates multiple sensory modalities in order to facilitate the acquisition of fundamental mathematical concepts among children with mathematical disabilities. With this perspective in mind, the researcher has chosen to investigate Pallanguzhi, a traditional game of Tamil Nadu that effectively utilizes various sensory stimuli as a means to impart fundamental mathematical concepts.

The current investigation was undertaken to scrutinize the impact of employing the conventional game Pallanguzhi as an educational instrument in enhancing the foundational mathematical abilities of children diagnosed with Mathematical Difficulties. The study's sample consisted of twelve children exhibiting symptoms of Mathematical Difficulties. Single group sampling approach and purposive sampling strategy were used. The intervention was administered over duration of two months, utilizing a play-based activity approach tailored to the participants' individual learning modalities. The outcome of the study showed that traditional games like Pallanguzhi improve children's math skills and make learning a fun-filled activity. The study proposes that incorporating traditional games into educational settings can serve as an effective tool for promoting learning in an enjoyable manner.

Keywords: Mathematical Difficulties, Traditional games, Basic arithmetic skill

Introduction

The emphasis on young children's early mathematics learning and development has been growing since the start of the 21st century (Broman T., 2014). Studies have demonstrated that prior to preparatory formal education, young children frequently exhibit an inherent fascination with mathematics. Furthermore, it has been observed that children engage in a significant number of mathematical activities during their unstructured play, including but not limited to classification, magnitude comparison, enumeration, and the identification of patterns and spatial relationships (Björklund, 2007). Conversely, extant research suggests that there exists a subset of young children who do not exhibit spontaneous attention towards numerical stimuli (Hannula & Lehtinen, 2005). Hannula and Lehtinen (2005) discovered that there appears to be a correlation between children's spontaneous focus and attention to numerosity and their later mathematical abilities. It is crucial to harness the innate interest and curiosity of young children towards mathematics in order to facilitate the acquisition of both formal and informal mathematical knowledge and skills, which are essential for their future mathematical learning and development.

There has been an increasing focus on the examination of young children's initial acquisition of mathematical knowledge and progress, specifically in regards to the nurturing of their understanding of numbers and spatial

abilities. During the initial stages of childhood, a significant number of children acquire mathematical experiences and cultivate their understanding of numbers, which in turn establishes the groundwork for their future acquisition of formal mathematics (Aster & Shalev, 2007). Numerous studies have provided evidence supporting the critical importance of early numerical knowledge and skills development in children. It has been noted that children who acquire a solid understanding of mathematics upon commencing their formal education tend to exhibit benefits in subsequent learning endeavors. These advantages extend beyond the realm of mathematics and encompass other academic domains such as science, literacy, and technology (Duncan et al., 2007). This suggests the significance of identifying efficacious activities that can engage and facilitate children's acquisition of numerical knowledge and skills in a deliberate manner, aiming to enhance subsequent and more intricate mathematical learning.

Mathematics can be characterized as a humanly devised discipline that encompasses the development of number systems and the establishment of rules, which serve as tools for comprehending and resolving diverse problem sets. The act of counting, performing calculations, and engaging in other formal mathematical endeavors is a product of cultural construction and acquired knowledge (Dehaene, 2011). Nevertheless, it appears that the fundamental processes that underlie our mathematical cognition and comprehension are inherent and universally present among humans across various cultures, as well as in other species (Dehaene, 2011; Feigenson et al., 2004). According to Dehaene (2011), there exists an innate preverbal numerical perception within individuals. In addition to general learning abilities, children are born with specialized learning mechanisms, also known as mental structures. The acquisition of mathematical skills in young children is notable, and their prior understanding can be used as a basis for their educational growth in preschool. In recent years, there has been an increasing focus on the topic of children's early math development and acquisition. This is because research has shown a strong connection between a child's early understanding and proficiency in math and their future performance in the subject. The importance of mathematical knowledge and abilities in modern society has been increasingly recognized in recent years. The integration of this recognition into the curricula of preschools and schools has been documented (Lembrer & Meaney, 2014). To enhance children's development of mathematical skills, it is crucial for educators to have a solid understanding of mathematics. Children are more likely to acquire knowledge when their instructors have a high level of self-assurance in the subject matter they are teaching. Scholarly discussion suggests that an effective pedagogical approach entails providing learners with a thorough understanding of individual concepts, promoting a deeper comprehension rather than simple memorization. However, it is important to note that if educators face challenges in their own learning of a specific subject, they may struggle to instill the confidence needed in children to demonstrate their competence in that area. The cognitive orientation of a child plays a crucial role in shaping their overall educational achievements. The development of these cognitive frameworks happens over time and is based on real-life experiences of the child.

Difficulties in acquisition of basic mathematical skills

The phenomenon of heterogeneity within the realm of mathematical difficulties is a subject of considerable intellectual inquiry. This pertains to the observation that individuals who experience challenges in the domain of mathematical concepts exhibit a wide range of diverse manifestations

There exists a substantial body of evidence indicating that mathematical difficulties exhibit heterogeneity, stemming from a diverse array of causative factors. Undoubtedly, this proposition has been previously put forth in certain seminal investigations pertaining to the advancement of dyscalculia (Kosc, 1974), and has since garnered substantial corroboration through subsequent scholarly endeavors. In order to delve into the intricacies of arithmetical challenges encountered by children, it is imperative to grasp a fundamental notion: arithmetic is not a singular entity, but rather a composite of various components. These components encompass an individual's comprehension of arithmetical facts, proficiency in executing arithmetical procedures, adeptness in comprehending and applying arithmetical principles such as Commutativity and associativity, capability in estimation, mathematical acumen, and the ability to employ arithmetic in the resolution of both verbal and practical quandaries, among other facets. Research conducted on children with typical development has yielded

educational and experimental evidence indicating that individuals have the potential to exhibit significant disparities across various aspects of arithmetic. A comprehensive examination of children exhibiting profound mathematical disabilities has revealed notable disparities in various facets of mathematical ability (Dowker, A. 2005). Impaired arithmetic skills are known to constitute a major obstacle for children's educational success. Gersten (2005) elucidates the salient discoveries derived from the limited database of scholarly inquiry pertaining to mathematics difficulties (MD) that bear relevance to the timely detection and remediation thereof. The empirical evidence indicates that (a) the mathematical challenges experienced by numerous children exhibit a lack of stability over the course of time; (b) the presence of reading difficulties appears to impede progress across various domains of mathematics; and (c) nearly all students afflicted with mathematical difficulties encounter difficulties in retrieving fundamental factual information.

Relationship between Play time and learning achievement

Engagement in play facilitates the acquisition of various proficiencies that prove indispensable for triumph in both the formative years of childhood and the subsequent stages of adulthood. These proficiencies encompass the art of making sound decisions, resolving intricate predicaments, exercising self-restraint, adhering to established regulations, regulating one's emotions, and fostering harmonious interpersonal relationships (Gray, 2011). The acquisition of self-regulatory skills becomes paramount upon the commencement of formal education for children. The ability to self-regulate serves as the foundation for cognitive and behavioral outcomes that are crucial for achieving success in the educational realm, such as academic accomplishments (Blair & Razza, 2007; McClelland & Tominey, 2016). However, although previous studies utilizing time diary methodology have indeed demonstrated a decline in the amount of time children spend engaging in play activities (Hoeffferth & Sandberg, 2001), the existing body of research has not yet explored the potential consequences of this reduction in play time on the self-regulatory abilities of children in the preschool age group. Furthermore, it is imperative to note that there exists a dearth of scholarly investigations pertaining to the potential ramifications of playtime on the nascent pre-reading and mathematical abilities of children, specifically in relation to its influence on the cultivation of self-regulation. In light of this perspective, the current study endeavors to harness the playtime as a delightful educational encounter for primary school students grappling with mathematical challenges, aiming to facilitate the acquisition of fundamental mathematical concepts.

Traditional games as an educational tool

Traditional games have an inherent capacity to effectively educate individuals in different aspects of their growth and development (Asrial et al., 2020). Engaging in play facilitates the acquisition of various essential aptitudes that prove instrumental in the progression of individuals from childhood to adulthood. These proficiencies encompass the ability to make informed choices, effectively resolve predicaments, exercise self-restraint, adhere to established guidelines, regulate one's emotions, and foster harmonious interpersonal relationships (Gray, 2011). The acquisition of self-regulatory skills assumes a paramount importance as children embark upon their educational journey. The ability to exercise self-regulation serves as the foundation for intellectual and behavioral outcomes that are indispensable for achieving success within the educational realm. This encompasses scholastic accomplishments, as evidenced by scholarly research conducted by Blair and Razza in 2007, as well as the comprehensive study conducted by McClelland and Tominey in 2016. However, it is worth noting that previous studies utilizing time diary methodologies have indeed demonstrated a decline in the amount of time children spend engaging in play activities (Hoeffferth & Sandberg, 2001). Nevertheless, it is crucial to acknowledge that the potential consequences of this decrease in play time on the self-regulatory abilities of preschool-aged children have not been thoroughly investigated in existing research. Furthermore, it is imperative to note that there exists a dearth of scholarly investigations pertaining to the potential ramifications of playtime on the nascent pre-reading and mathematical aptitudes of children, specifically in relation to its influence on the cultivation of self-regulatory capacities. In light of this perspective, the current investigation has been undertaken to harness the playtime as a delightful educational encounter for primary school students grappling with mathematical challenges, thereby facilitating the acquisition of fundamental mathematical

concepts. Games serve as a potent catalyst in facilitating the multifaceted development of a child, encompassing domains such as physical maturation, socio-emotional advancement, sensory-motor refinement, communicative prowess, cognitive acumen, conceptualization aptitude, comprehension and cognitive processing proficiencies, executive functioning, perceptual preparedness for educational pursuits, and the cultivation of auditory, literary, and mathematical competencies (Kamid et al., 2022). In addition, traditional games are also effective in teaching various life skills, particularly social skills. In the Indian context, children often engage in playing traditional games such as five stones, Pallanguzhi, Paandi, Hide and Seek, Spinning Tops, Paramapada, Sopaanam, SolanuKattam, Ludo, Goli, Snake and Ladder, Seeds Game, and Sack Race. Traditional games play a crucial role in fostering the development of various skills in children. According to Aristha et al. (2017), these activities, such as hopping, balancing, rolling, and fine motor skills involving object manipulation, contribute to the improvement of motor skills. These games effectively enhance children's ability to control and use objects. Traditional games, like Pallanguzhi, play a crucial role in the development and overall well-being of children. They help cultivate essential skill sets that ultimately contribute to their learning capabilities. This promotes the improvement of balance, regulation of the vestibular system, stimulation of touch, development of spatial cognition, concentration, and attentiveness.

The incorporation of natural materials in numerous traditional games introduces children to a variety of textures, weights, and shapes. These games help children develop the ability to distinguish between different textures, even before they can communicate about them verbally. Sensory stimulation is extremely important in the early development of children (Nasrullah & Zulkardi, 2011).

Several traditional games, such as flick-top, marbles, gilli-danda, and five stones, help nurture hand-eye coordination skills (MDA Vinita Sidhartha, 2021). These games help children develop the important skill of coordinating their hand movements with their visual perception, which is necessary for many activities in life. Developing this skill at a young age and strengthening it through games is advantageous for children in the long term. Children are often introduced to counting and understanding numbers through traditional games that involve dice movements and point scoring. This game is designed to teach children how to count up to one hundred and beyond. Additionally, it helps them understand number sequences and addition through the use of dice movements. Playing games also helps children learn the importance of following rules. Smooth interpersonal interactions and functioning in various aspects of life often require adherence to certain rules. Games like Pallanguzhi offer children an early introduction to following rules, which includes understanding directions, making choices, and recognizing the limitations set by the game.

Traditional games offer a wide range of valuable lessons for children, including the development of motor skills, sensory skills, and hand-eye coordination. Additionally, these games foster critical thinking, counting, and understanding of numbers. According to a study (Gyöngyösi, 2012), traditional games have been found to be effective in enhancing the attention span of hyperactive children who often struggle to remain seated. These games specifically target and improve fine motor skills through activities such as manipulating beads or tamarind seeds. Moreover, engaging in these games helps develop mathematical abilities and hand-eye coordination. Additionally, the enjoyment derived from these games fosters intergenerational interaction within families, creating a positive and enriching experience for both upper primary and primary children.

Traditional Games and its benefits their Relevance to mathematics concept

Traditional games help children practice number recognition and counting skills. (Kaufmann et al., 2013) Traditional games improve basic arithmetic skills at the primary level. Play moths games to have fun and improve comfort with mathematics for children with Mathematical Difficulties. MDA Chandrasekhar (2020) emphasized the importance of traditional games in developing basic arithmetic skills for children. Traditional games serve to augment the cognitive development of children with Mathematical Difficulties by fostering the refinement of sensory acuity, physical prowess, the harmonization of hand-eye movements, the cultivation of fine and gross motor proficiencies, the cultivation of equanimity in the face of triumph and defeat, the enhancement of concentration, the honing of strategic and tactical acumen, the fostering of rapid cognitive

processing, the cultivation of rudimentary computational skills, the promotion of analytical thinking in the context of game play, the facilitation of interpersonal engagement through collaborative play and team-oriented endeavors, the cultivation of patience in awaiting one's turn, the reinforcement of numerical literacy, the bolstering of memory capabilities, and the fostering of social aptitudes through communal interactions and cooperative undertakings.

The game is most popularly played in Tamil Nadu, i.e., Pallanguzhi,

Pallanguzhi



The conventional activity of Pallanguzhi serves as a catalyst for the cultivation of numeracy aptitude, as well as the refinement of both fine and gross motor skills. Moreover, the engagement in this activity facilitates the development of midline crossing, cognitive competence, and the enhancement of sensory acuity ([MDA Leela Natarajan, 2021](#)). Pallanguzhi is a game for two players. Seven cups are controlled by each player out of the 14 on the board. Tamarind seeds or shells are used for this play. The game fosters the development of hand-eye coordination and mathematical aptitude. This enjoyable recreational activity is engaged in by individuals spanning across multiple generations within a familial context, fostering a sense of connection and unity. It is truly remarkable when a singular participant manages to amass the entirety of the available cups within the confines of the game's prescribed guidelines.

Game	Category of basic arithmetic concept	Academic goals: Outcome of the game played and developing arithmetic skill
Pallanguzhi	Organizing mathematics situation	Eye hand co-ordination Sequencing/counting/calculation
	formulating an arithmetic situation	Build relationships and strengthens bonds, enhances Fine motor coordination
	synthesizing data Solve arithmetic situation	Remembering Attention Finger dexterity Cognition Spatial Intelligence

		Sequence of number, Comparison of number
	Interpret arithmetic situation	Learning to win and lose
		Counting of numbers Addition & subtraction
		Motor skills, sensory skills and hand- eye coordination
		Social skills

Review of related literature of the study

In recent decades, there has been a discernible reduction in the temporal allocation dedicated to recreational activities, which may potentially engender a perilous situation for the cultivation of early self-regulation. This fundamental aptitude is imperative for the attainment of school readiness. There has been a notable lack of adequate focus on the exploration of the correlation between the allocation of time dedicated to play and the development of children's self-regulatory abilities, as well as their aptitude in the domains of reading and mathematics. The scholarly inquiry undertaken by Miller et al. (2022) delved into the intricate nexus between the temporal investment in domestic play and the cultivation of self-regulatory aptitude, pre-reading acumen, and numeracy proficiency within a cohort of 128 young individuals, aged between four and five years. The research endeavor utilized time diaries and direct assessments as means of data collection pertaining to these variables. The observed correlation between recreational activities and the advancement of pre-literacy and numeracy proficiencies was found to possess an indirect effect on these aptitudes following duration of twelve months, predominantly facilitated by the acquisition of self-regulatory competencies. The empirical evidence suggests that active participation in recreational activities during the formative years of early childhood possesses the capacity to augment preparedness for the structured educational system.

The cultivation of numerical comprehension is a fundamental mathematical skill that should be nurtured in early childhood, as indicated by research undertaken by Feigenson et al. (2004) and Von Aster & Shalev (2007). This comprehension establishes the foundation for children to explore the field of mathematical concepts and gain the essential principles of arithmetic that are crucial for navigating the contemporary society. As previously stated, there has been a proposition suggesting that the mechanisms behind a child's capacity to acquire and employ mathematical knowledge may be innate (Dehaene, 2011; von Aster & Shalev, 2007). The Approximate number system (ANS) and the Object tracking system (OTS) enable the brain to nonverbally encode numerical quantities (Dehaene, 2011; Hyde & Spelke, 2011). The systems outlined here are commonly acknowledged as fundamental numerical systems (Feigenson et al., 2004). According to Feigenson et al. (2004), these systems are responsible for our basic intuitions about numbers and form the basis for the more advanced numerical concepts that are specific to humans (Dehaene, 2011; Von Aster & Shalev, 2007; Prabavathy & Sivaranjani, 2011).

Mathematics games have gained popularity among teachers as a substitute for conventional repeated practice methods. These games are frequently utilized in school classrooms as incentives for students who complete their tasks ahead of schedule (Afari & Ernest, 2012). Pallankuzhi has been found to have a positive impact on enhancing children's attention span MDA (2021). Traditional games provide an optimal environment and resources for both educational and recreational purposes. Engaging in traditional games serves as an enjoyable and intellectually stimulating approach to acquire knowledge pertaining to numerical concepts. At the elementary level, the concept of skip counting is integrated with the development of multiplicative thinking. Traditional games have been found to enhance mathematical skills through factors such as motivation, good attitude, enhanced learning, and the provision of varied levels (Setiyadi et al., 2018). These games enable children to work freely without relying on parental aid. According to Nasrullah and Zulkardi (2011), the authors elucidated that ancient games contribute to the development of students' sense of number, enabling them to

grasp concepts such as reference number, counting number, and numerosity number. The exploration of traditional games presents an intriguing dimension that offers valuable benefits for children. Aarti Rajarathinam (2021), the development of critical academic and life skills is particularly facilitated by CWLD. This process proceeds gradually and inconspicuously, without causing distress or conscious awareness of the changes in the children. In a study conducted by Vinita Sidhartha (2021), it was shown that traditional games serve as a means of instructing children in the development of motor and sensory skills, hand-eye coordination, critical thinking abilities, and number awareness.

Objective of the study

The stated objectives provide explicit guidance to both the investigator and serve to enhance appropriateness. The ensuing discourse shall elucidate the fundamental objectives that underpin the present investigation.

- Identify basic arithmetic skill difficulties among children with Mathematical Difficulties.
- Examine the performance in basic arithmetic among Children with Mathematical difficulties in the domains of number counting, sequential number, skip counting, critical thinking, and number sense, memory, eye- hand coordination.
- Assess the efficacy of traditional games as a remedial approaches in improving the fundamental arithmetic abilities of children with Mathematical difficulties

Research Questions

- Do primary school children encounter challenges when acquiring fundamental math concepts?
- Is it challenging for a child with mathematical difficulties to comprehend fundamental arithmetical concepts?
- Can the use of traditional games such as Pallanguzhi help the mathematics learning abilities of children?
- Can the inclusion of traditional games, such as Pallanguzhi facilitate the development of fundamental arithmetic skills in youngsters while fostering a sense of joy and engagement?

Method of this study

The research study utilized a single-group pretest-treatment-posttest experimental design. The study sample consisted of twelve children who exhibited indicators suggestive of academic challenges. The researchers utilized the single group sampling approach and employed a purposive sampling strategy in their study. The current study utilized the traditional game of Pallanguzhi as an intervention strategy, treating it as an independent variable, while evaluating its influence on fundamental arithmetic skills, which were regarded as the dependent variable. The intervention was executed over duration of two months, utilizing a play-based activity approach that was tailored to accommodate the distinct learning styles of the participants.

In this scholarly investigation, the researcher aimed to meticulously curate a representative sample from a populous cohort of students currently enrolled in elementary educational institutions situated in Tiruchirappalli. The selection of the sample was predicated upon the diagnostic evaluation carried out by the researcher. The examination centered its attention on the mathematical abilities of the children during the preliminary assessment. The investigation highlighted the challenges encountered by the pupils. Consequently, a meticulously designed intervention programme was developed with the specific aim of improving children's proficiency in fundamental arithmetic operations, including counting, addition, subtraction, and recall. The intervention strategy was carefully chosen and designed to incorporate a wide range of multisensory and multimodal activities, resulting in a comprehensive and enriched approach. A post-test assessing basic arithmetic skill was performed following a two-month intervention period. The scores were obtained from a cohort of individual students.



First step:

Each cavity contains either five seeds or five stones. The game begins with the first participant selecting and collecting seeds from one of their designated holes. They then disseminate one seed into each of the adjacent holes in a counterclockwise direction. The participant must position the seeds in the designated holes until they have successfully filled every void. The seeds adjacent to the empty cavity may now be collected. During the initial stage, children develop fundamental numeracy abilities, such as counting to five. In addition, they develop their organizational skills by practicing placing a single seed in each corresponding cavity until they reach an empty hole.

Second Step:

Subsequently, it is the turn of the second player. To obtain the pebbles or seeds, the second player must engage in a calculation procedure that entails assessing the number of holes and pebbles on their side of the game board. The final goal is to reach the unoccupied hole situated on their opponent's side. The procedure will continue till the participants reach an empty cavity and collect the seeds in close proximity to such cavity. Individuals' ability to perform computational tasks may result in either a significant accumulation of points or a complete absence of points. Through active participation in this game, individuals develop the capacity to conduct computations pertaining to the number of pebbles and the number of holes. This game promotes the advancement of multiple cognitive abilities in children, encompassing capabilities such as sequencing, spatial reasoning, arithmetic concept learning, adherence to game rules, decision-making, and concentration enhancement.

The third step is as follows:

The initiation of the first player's turn is contingent upon the completion of the second player's game, during which the final seeds or players that were deposited into the game have been collected by said player. The aforementioned approach exhibits the power to enhance a child's fine motor skills, tactile awareness, and memory capacity.

Step 4

The completion of a players game is reached when the last seed is placed into a hole that is immediately followed by two empty holes, and the player has not managed to collect any seeds. Spatial intelligence is advantageous as it facilitates the establishment of connections and reinforces preexisting ties.

Step 5:

The game reaches its conclusion when a player no longer possesses any remaining seeds. After the preliminary stage, players begin to remove the seeds from their separate deposits and strive to distribute them uniformly among the available holes, assigning a consistent quantity of five seeds to each hole. Participating in this endeavor has been determined to enhance sensory acuity, strategic thinking, and the synchronization of visual perception and motor capabilities.

Findings and analysis of the study

Results from an accomplishment exam were obtained after the current study was completed, allowing the researchers to develop a customized course of study for each participant.

Table: 1

Mean Standard deviation and t-value of the Pretest and Post-test scores of basic arithmetic skill

Concept-1						
variable	Test	N	Mean	S.D	't' value	Remark
Number concept	pre	12	16.09	5.75	12.06	Significant at the level of 0.01
	post	12	55.69	15.3		
Concept-2						
variable	Test	N	Mean	S.D	't' value	Remark
Basic addition	pre	12	18.96	6.03	13.35	Significant at the level of 0.01
	post	12	58.46	16.41		
Concept-3						
variable	Test	N	Mean	S.D	't' value	Remark
Special ability	Pre	12	19.33	7.89	15.84	Significant at the level of 0.01
	Post	12	57.69	15.28		
Concept -4						
variable	Test	N	Mean	S.D	't' value	Remark
Motor skill	Pre	12	14.56	6.22	18.37	Significant at the level of 0.01
	Post	12	62.03	19.23		

It is concluded from the following table that the difference in performance between pre-test and post-test is significant at the 0.01 level. Thus traditional game based intervention strategy has enhanced the basic arithmetic skill of children with learning disabilities.

Table: 2

Effect size (d) of the difference between the mean of the sample with Pretest and Post-test scores of basic arithmetic skill

Test	N	Mean	S.D	Effect size
pre	12	16.09	5.75	1.40
post	12	55.69	15.3	

The findings of the above table, according to Cohen effect size for interpreting $d=0.8$ or more shows large effect size, i.e. the differences are perceived. The findings show that the traditional game based intervention strategy has enhanced the basic arithmetic skill of children with Mathematical Difficulties.

Inference

Playing traditional games yield notable enhancements in various domains, including children's overall focus and concentration, as well as their motor skills. The major objective of this study was to examine the efficacy of

traditional games in improving fundamental arithmetic abilities among elementary school students who have learning difficulties. The findings of the study revealed a statistically significant enhancement in the mathematical abilities of the children following duration of three months during which they participated in an intervention programme consisting of customized traditional games aligned with their individual learning styles. The examination of the achievement scores revealed a significant improvement in performance from the initial assessment to the final assessment phase. The observed improvement demonstrated statistical significance at a significance level of 0.01, suggesting that the implementation of the conventional game-based intervention approach had a beneficial effect on the mathematical skills of children who have learning difficulties. In addition, the study of effect size indicated a substantial effect size ($d = 1.40$), exceeding the established threshold of 0.8 or greater according to Cohen's criterion for a statistically significant effect. This implies that the observed disparities in arithmetic proficiency scores between the pretest and post-test phases were significant and deserving of attention. The results of this study offer empirical support for the notion that traditional games have the capacity to augment fundamental arithmetic abilities in children who experience learning impairments. These games provide a comprehensive educational approach by fostering physical development, social-emotional growth, sensory-motor advancement, communication proficiency, problem-solving aptitude, conceptual understanding, and a range of cognitive and life skills. Based on the findings of this study, it is advisable to integrate conventional games into educational treatments targeting children with learning difficulties.

Recommendation of this study

- To enhance the scope of the study, it is recommended to incorporate a diverse selection of youngsters originating from different cultural and geographic backgrounds. This approach would provide a more comprehensive perspective on the impact of traditional games throughout diverse cultures.
- A longitudinal study will be conducted to investigate the enduring effects of children's consistent engagement in traditional games on their skill development. To obtain valuable insights into the enduring benefits of these games, it is advisable to conduct an extended monitoring of their impact on individuals' development.
- This study aims to conduct a comparative analysis of the outcomes observed in children who engage in traditional games against those who exclusively participate in contemporary video games or other non-game-based activities. This comparative analysis would facilitate the assessment of the unique advantages offered by traditional games.
- This study aims to investigate the impact of parental engagement on children's involvement in traditional games through the provision of encouragement and assistance. An examination of parental attitudes, beliefs, and practices towards traditional games can provide a broader contextual framework for interpreting the outcomes of this study.
- Intervention Programmes: Develop intervention strategies that incorporate traditional games inside educational settings. Execute these programmes and evaluate their effectiveness in enhancing children's motor, sensory, hand-eye coordination, critical thinking, and numeracy abilities.
- Teacher Education: Provide educators with training sessions aimed at integrating traditional games into their instructional practices. Educators can acquire the requisite knowledge and skills to effectively incorporate traditional games into the instructional framework, hence optimizing educational achievements.
- To foster community engagement, it is recommended to strategize and implement various activities, workshops, or campaigns aimed at enhancing awareness regarding the benefits associated with traditional games. The promotion and revitalization of traditional games within communities would serve as a catalyst for preserving cultural norms and enhancing their educational significance.

Conclusion

Traditional games possess a remarkable capacity to effortlessly impart knowledge and facilitate various facets of human development, encompassing physical development, socio-emotional growth, sensory-motor

advancement, effective communication, cognitive problem-solving, the cultivation of conceptual understanding, the refinement of information processing abilities, the honing of executive functions, the enhancement of perceptual readiness for educational pursuits, the cultivation of attentive listening, proficient reading and proficient writing, in addition to an array of invaluable life skills, notably social aptitude.

The incorporation of such gaming applications can be seamlessly integrated within the framework of Individualized Education Plans (IEPs) in order to deliver tailored assistance and cater to the unique requirements of every student. Through the utilization of the advantages offered by conventional games, educators and practitioners have the ability to cultivate a stimulating and efficacious educational setting that facilitates the enhancement of arithmetic proficiency and diverse other fundamental capabilities in children afflicted with learning difficulties.

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