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Generating Piaget and Vygotsky-Grounded Parents: Home-Based Approaches to Enhance Cognitive Development among Young Children

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Abstract

Research on the cognitive development of toddlers and preschoolers is crucial due to the rapid intellectual growth and foundational learning that characterizes early childhood. The theories formulated by Jean Piaget and Lev Vygotsky have provided profound insights into the mechanisms of cognitive development, offering distinct perspectives on how children acquire knowledge and develop intellectually. These theories have been extensively explored by scholars in various educational settings, both collectively and individually, demonstrating their significant impact on teaching and learning practices. Despite the considerable contributions of Piaget and Vygotsky to the field of education, there remains a noticeable gap in the literature concerning how parents can effectively apply their principles to enhance their children's cognitive development at home. This qualitative study aimed to address this gap by exploring practical, home-based approaches derived from Piaget's and Vygotsky's theories to promote cognitive development among young children, with a specific emphasis on the role of parents as facilitators of learning. The findings revealed ten emerging themes that encompassed Piaget and Vygotsky-inspired activities, including fruit exploration, plant jars, hanging laundry, pretend play, snake and ladder games, baking, storytelling, obstacle courses, memory games, and float-or-sink experiments. These activities were not only aligned with the theoretical frameworks of Piaget and Vygotsky but were also found to significantly enhance children's developmental milestones in an interactive and supportive manner.

Keywords: Piaget, Vygotsky, Parents, Cognitive Development, Young Children

Introduction

Cognitive development refers to the process of intellectual growth and the advancement of thought and problem-solving abilities from infancy to adulthood. Cognitive development encompasses changes and stability in mental skills such as attention, memory, learning, language, reasoning, thinking, and creativity (Bjorklund, 2022; Papila,

et al., 2007). Cognitive development is defined as the progression of increasingly sophisticated thinking, reasoning, and understanding of the world through the interaction of genetic and learning factors (Kail, 2016; Ormrod, 2011; Tanjung et al., 2024 & Santrock, 2010, 2011).

Literature Review

Theorist of Cognitive Development

Theories of cognitive development provide essential insights into the nature of human thought processes and their likely evolution with age**.** Two of the most renowned and widely applied theories of cognitive development are those of Jean Piaget and Lev Vygotsky.

Piaget's theory (1983) is divided into two interconnected components that collectively contribute to cognitive development- cognitive processes and stages of cognitive development. Cognitive processes include elements such as schema, organization, adaptation, assimilation, accommodation, and equilibrium. The stages of cognitive development, on the other hand, outline abilities at the sensorimotor (birth to 2 years), preoperational (2 to 7 years), concrete operational (7 to 12 years), and formal operational stages (12 years and older).

Vygotsky's theory of cognitive development is rooted in social interactions. Three major themes underline Vygotsky's theory- Social Interactions, the More Knowledgeable Other, and the Zone of Proximal Development (ZPD). The ZPD, one of Vygotsky's key concepts, posits that adult in any society intentionally and systematically foster children's cognitive development (McLeod, 2013;2020; Santrock, 2010, 2011, 2019).

The study of cognitive development, particularly in preschool and school-aged children, has been central focus of developmental research over the past three decades (Belyh, 2019; Fischer & Bullock, 1984; Kail, 2016; McLeod, 2013;2020; Santrock, 2010, 2011, 2019; Stein et al., 2023). The cognitive development theories put forward by Piaget and Vygotsky have significantly shaped the educational landscape. One notable example is their contribution to the development of constructivism. This educational philosophy asserts that learning is not merely about absorbing new information. Learners actively engage their personal experiences and skills to interpret and ascribe meaning to new information, thereby constructing their own understanding and knowledge (Blake & Pope, 2008; Ghosh, 2024).

Application of Vygotsky and Piaget theories in cognitive development of young learners

Jean Piaget's theory of cognitive development emphasizes the stages through which children pass as they interact with their environment, proposing that cognitive growth is driven by a child's innate curiosity and ability to adapt to new experiences. Piaget identified distinct stages of development, each characterized by specific types of thinking and learning. His constructivist approach suggests that children build their own understanding of the world through active exploration and hands-on experiences, highlighting the importance of providing stimulating environments that encourage self-discovery (Babakr, et al., 2019).

In contrast, Lev Vygotsky's sociocultural theory underscores the fundamental role of social interaction and cultural context in cognitive development. Vygotsky introduced key concepts such as the Zone of Proximal Development (ZPD) and scaffolding, which describe how children

can achieve higher levels of understanding with the support and guidance of more knowledgeable others. This theory suggests that cognitive development is not only an individual process but also a collaborative one, deeply embedded in social contexts and communication. Application of both theories when designing activities for children can immensely enhance children's cognitive ability (McLeod, 2020).

Parents' role in children's cognitive development

Given the importance of early cognitive development and the influential theories of Piaget and Vygotsky, parents, who are the More Knowledgeable Other (MKO), play a crucial role to carry-out various practical and theory-grounded activities at home. Parents are children's first teachers and since intellectual ability of a child is determined by both heredity and environment, parents should be involved in their children's cognitive development (Lab, 2021; Nivard et al., 2024). Parents can help their children develop sound cognitive structures by providing a stimulating learning environment and a variety of experiences from an early age (UNICEF Serbia, 2024).

Parents play a critical role in their children's cognitive development through various means that shape intellectual growth, critical thinking skills, and emotional well-being (Lonczack, 2019). Positive parenting, characterized by sensitivity, warmth, acceptance, and cognitive responsivity, significantly enhances children's cognitive abilities (Prime et al., 2023). This involves actively engaging with children, responding to their needs, and maintaining their attention during interactions. A family where both parents actively participate equally in all aspects of the child's upbringing such as care, play, learning, and other activities, significantly enhances the child's confidence, emotional stability, and overall success (UNICEF Serbia, 2024).Positive parenting interventions improve mental abilities and language skills in children, creating a supportive and enriched environment for cognitive development. Parents can stimulate cognitive growth by providing a variety of toys and materials that encourage exploration and imagination, engaging in interactive activities like reading, playing educational games, encouraging them to participate in household chores and exposing children to diverse experiences such as museum visits and cultural events (Prime et al., 2022).

Past Studies on the Application Piaget and Vygotsky's Theories in Teaching and Learning

The cognitive development of toddlers and preschoolers is a critical area of study, as early childhood is a period of rapid intellectual growth and foundational learning. Theories developed by Jean Piaget and Lev Vygotsky have provided profound insights into the mechanisms of cognitive development, each offering unique perspectives on how children learn and develop intellectually.

Numerous scholars have extensively explored the application of Piaget and Vygotsky's theories in teaching and learning across diverse educational settings, both collectively and individually. For instance, research has investigated how these paradigms inform instructional management and assessment practices (Blake & Pope, 2008; Saracho, 2023). The integration of Environmental Education (EE) in Early Childhood Education has also been examined through the lens of Piaget and Vygotsky's theories (Hebe, 2017; Chen, 2024). Additionally, several researchers have emphasized the significance of these theories in play-based learning for young children (Bodrova, et al., 2013; Singh & Ngadni, 2023; Wagner, 2024). Studies have also focused on the application of these theories in mathematics education at various levels (Denhere, et al., 2013; Palmér & Bjorklund, 2024). Given the extensive influence of Piaget and

Vygotsky, it is evident that any attempt to fully encapsulate their impact on cognitive development would be incomplete.

Despite the significant contributions of these theorists to the field of education, there appears to be a paucity of literature on how parents can utilize Piaget and Vygotsky's principles to enhance their children's cognitive growth at home. This study therefore explores how these theories can be translated into practical, home-based approaches to enhance cognitive development among young children, with a focus on the role of parents as facilitators of learning.

Significance of Study

By bridging theoretical concepts with practical applications, this research aspires to offer valuable insights and tools for parents, educators, and policymakers dedicated to fostering optimal cognitive development in early childhood. Findings on Piaget and Vygotsky-grounded home-based approaches reveal significant improvements in children's problem-solving abilities and social interaction skills. These approaches not only enhance cognitive development but also contribute to a supportive home environment where children can thrive academically and socially. By integrating these theories into everyday interactions and activities, parents can play a proactive role in nurturing their child's cognitive growth, laying a strong foundation for lifelong learning and achievement. Educators can utilize these findings to design curriculum and educational strategies that align with developmental theories, ensuring comprehensive support for children's cognitive and social-emotional development from an early age. Policymakers can consider these insights when shaping policies and initiatives aimed at promoting early childhood education and parental involvement, thereby fostering a more conducive environment for children's overall well-being and academic success.

Methodology

Research design

This study employed a qualitative research design using co-operative inquiry. Co-operative inquiry was found suitable as it provided researchers with a participatory research method that emphasizes collaboration between researchers and participants. Since it involves a cyclical process of reflection, all participants contributed equally to the inquiry process, fostering deeper understanding, and generating actionable insights for this study (Godden, 2016; Russ et al., 2024).

Participants

To explore how Piaget and Vygotsky's theories can be translated into practical, home-based approaches to enhance cognitive development among young children, with a focus on the role of parents as facilitators of learning, this study involved six participants, including the lead researcher in conducting research using co-operative inquiry. A diverse group of individuals who share common interest in parental involvement and cognitive development were purposefully selected by the lead researcher. Since this study required an in-depth and high-level inquiry, each participant selected was required to have a minimum of two years previous teaching experience at any early childhood education centre and a minimum of three years teaching experience in early child education at any higher education institution to enrich the inquiry. Typically, since co-operative inquiry believes that there is no single "researcher" or

"subject", all participants selected for this inquiry became the co-researchers for this study. All researchers who were also participants in this exploratory case study, were given a pseudonym R1 to R6.

Data Collection and Analysis

The lead researchers together with co-researchers then devised the methodological framework for data collection as illustrated in Figure 1 below.

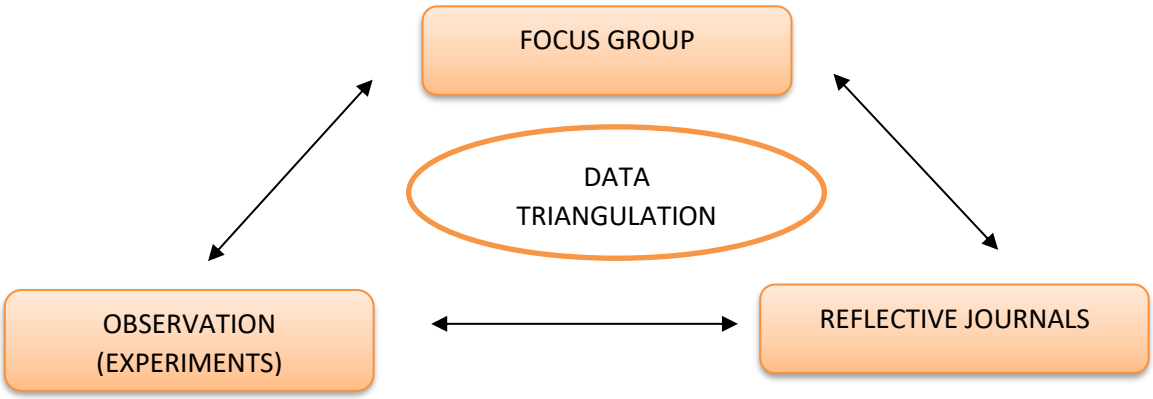

Figure 1: Data Triangulation

To enhance the robustness of this study, a data triangulation method was employed. According to Creswell (2007), qualitative research heavily relies on data obtained by the researcher through first-hand observation, document analysis, focus groups, interviews, recordings in natural settings, and artifacts. Researchers agreed on utilizing multiple data sources to develop a comprehensive understanding of the phenomena (Khoa et al., 2023; Patton, 1990).

The rationale for using this approach is that triangulation can increase the credibility and validity of the findings, as consistent results from different methods provide greater confidence in the data (Creswell, 2007). In this study, qualitative data were collected through focus group discussions, observations during experiments, and reflective journals. Focus group discussions offered insights into a range of ideas from each co-researcher and highlighted differences in perspectives (Krueger & Casey, 2000). Researchers conducted several experiments using physical artifacts to further examine the impact of suggested activities on children's cognitive development. These experiments also validated data obtained from reflective journals and focus group discussions.

Data analysis was conducted using Miles, et al.'s (2014) Interactive Analysis Model, which involves three iterative phases: data minimization or "data reduction," data presentation or "data display," and data verification or the production of conclusions, as illustrated in Figure 2 below.

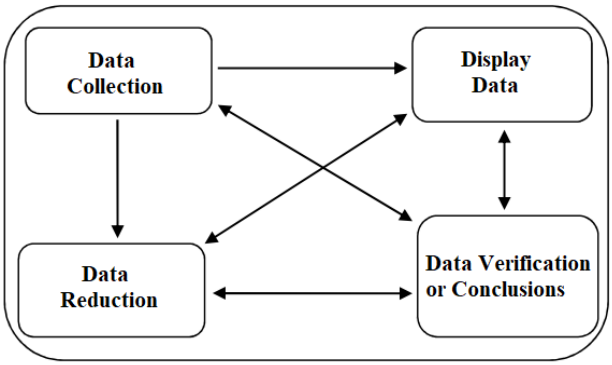

Figure 2: Interactive Analysis Model in Qualitative Research data analysis (Miles, Huberman and Saldana, 2014)

After completing multiple cycles, data was synthesized to identify overarching themes and insights. This involved aggregating data across cycles and collaboratively interpreting the results.

Findings and Discussion

Data obtained from interactive analysis derived ten Piaget and Vygotsky-based activities that parents can use to enhance cognitive development among toddlers and preschoolers**.** The findings are discussed in detail below.

Fruit Exploration

Based on data analysis from the focus group discussion, all co-researchers expressed that fruit exploration can enhance a child's cognitive level as it activates sensory. Fruit exploration as a sensory activity can be associated with both Piagetian and Vygotskian theories, though they emphasize different aspects of the learning process.

Parents may cut colourful fruits into small pieces and place them in a clean bowl so that the child can squeeze or chew them safely. Allow the child to touch, taste, and interact with the fruits, ensuring there is no history of fruit allergies.

-R1

Based on the practical experiment done, researchers conform that sensory activities were able to foster exploration and inherently encourage children to employ scientific processes through play, investigation, and exploration. Jean Piaget's theory of cognitive development emphasizes the importance of hands-on, active learning in the developmental stages of children. Fruit exploration aligns with Piaget's theory in both at the sensorimotor stage (0-2 years) and preoperational stage (2 -7 years). At the sensorimotor stage, children learn about the world through their senses and actions. Handling and tasting different fruits can help infants make sense of their environment while at the preoperational stage, children use symbolic thinking and are developing language. Exploring fruits can help with categorization, learning names, and understanding properties such as colour, texture, and taste.

The child learns colours by looking at these fruits, explores different textures by touching them and experiences various smells while squishing and smashing these fruits.

-R3

On the other hand, Lev Vygotsky's sociocultural theory focuses on the role of social interaction and cultural tools in learning. Participants agreed that fruit exploration fits within Vygotsky's framework as it encourages social interaction. Children can explore fruits in a social context, guided by a more knowledgeable adult or peer, which Vygotsky termed the "Zone of Proximal Development" (ZPD). This guided interaction helps children learn more effectively. Besides, when children describe the fruits, discuss their characteristics, and ask questions about them, language development and cognitive growth occurs.

When parents help and guide children in fruit activity, the parent who is more knowledgeable can interact and help children learn more effectively, especially language development.

-R6

Consistent with several previous findings, this study indicates that fruit exploration assists children in learning the sensory attributes Zeinstra et al (2007); Martins (2024) and new schemata are developed through children's observation and exploration. Schemata continue to exist in proportion to the new information that is learned (Baskale, et al., 2009). Engaging in sensory activities such as fruit exploration enables children to enhance their tolerance for various sensory inputs, thereby aiding their brains in forming stronger neural connections to process and achieve sensory equilibrium (Majumdar, 2020).

Plant Jar

Most gardens are visual treatment of colours, tones and shades (Butcher & Pletcher, 2017). Growing a plant in a jar could promote both physical and cognitive development among young children.

When parents guide children to fill a medium-sized jar with a damp paper towel, place a few dry beans between the inside of the jar and the moist paper towel, and then place near a sunny window, children not only work their psychomotor skills, but they also start to think critically by asking questions or seeking verifications while the activity is carried out.

-R2

Gardening helps children to learn about seedling techniques, importance of temperature, nutrition information and textures of sprouts. Children notice and compare shapes, sizes, and weight of seeds, foliage, and learn scientific reasoning to predict which seed will grow what vegetable (Baskale, et al., 2009; Monsur et al., 2024). An overall gardening activity promotes environmental stewardship, social skills, importance of nutrition and health, science education and adapting practical living skills (Monsur et al., 2024; Stoecklin, 2001).

Hanging Laundry

Hanging laundry, although a well-known household chore, can serve as an important educational opportunity for children. According to Child Development experts, engaging children in everyday tasks like hanging laundry can help develop fine motor skills, teach responsibility, and provide opportunities for learning about sequencing and categorization (Department for Education Australia, 2022). It also provides opportunities to build relationship skills like communicating clearly, negotiating, cooperating, and working as a team (Sirem, 2022).

This activity can be done through scaffolding. Once the washing cycle is complete, parents can request children to help in uploading the clothes into a basket. Then, parents may request their children to hang the clothes outside to dry. If the drying rack is too high, parents may make a smaller version of rack suitable for the height of their children. Give them some colourful pegs and guide them to match the pegs with colour of clothes and hang them according to sizes. This way children develop analytical skills.

-R1

Hanging laundry by colours promote cognitive, visual and motor skills in children. This activity demonstrates strong relation between visual perception and visual motor integration and cognitive skills like analysing, sequencing, and problem solving. Children are believed to create new schemata by imitating, investigating, comparing and classifying the things around them (Baskale, et. al., 2009).

Children not only acquire teamwork skills, they will also grasp task sequences, and expand their vocabulary through social interactions that enrich their learning experience.

-R2

Pretend play / Role Play

'Pretend play', also known as symbolic play, imaginative play, make-believe play, and dramatic play allows children to explore their fears in a safe setting. "In play the child is free". But this is an "illusory freedom" (Vygotsky 1967, 10). According to Bodrova et al (2013), play signals the beginning of imagination and the ability to think creatively. It can be done easily at home during bath time, dinner time or even when getting dressed.

Offer plastic boats, cups, and rubber dolls and pretend with your child that you are at the sea. In reality, you are actually in a bathtub.

-R4

Collect some old clothes for your child to use to dress up a doll and have a make believe conversation as a make-up artist. Or just arrange and stack up chairs and say to your child 'Let's pretend we're on a rocket ship'.

-R6

Children create pictures in their minds of past experiences and use their imaginations to think of new scenarios. According to Piaget, assimilation is the component of the adaptation when the information that can fit into the learner's existing knowledge is added into the learner's cognitive structures (Piaget, 1983). Through pretend play, children learn about cultural norms and expectations, about their environment and their world.

As put forward by Richard et al (2021), pretend play-based activities that are aimed at enhancing children's emotion comprehension, emotion regulation, and prosocial behaviour has shown significant positive effects as it leads to marked improvements in children's cognitive ability.

Snake and Ladder Board Game

Parents can play board games with their children. A board game like snake and ladder can develop cognitive skills in children as early as possible especially the ability to count. One of

the key implications of Piaget's theory is the adaptation of instruction to align with the learner's developmental stage (Piaget, 1983).

Counting concepts and principles in snake and ladder is fun and motivating and help children develop confidence in quantifying collections (Fidrayani et al., 2020; NSW, 2023; Syafrida, 2020).

Generally when children throw the dice, a number appears. Parents can teach mathematic skills immediately. Counting the number. Then asking children to think about the consequences if they move the number of steps indicated by the dice. Can be quite surprising to hear their answers.

-R5

As children progress, they also indirectly develop language to express their thoughts (Syafrida, et al., 2023). Language like forward, backward, before, after, next, promotes literacy in young children. Children also develop essential social and emotional skills like turn-taking, reciprocity, and coping with winning and losing through playing board games. (Alwaely, et al 2021).

Baking

Baking is one of the activities parents can do with their child. Through baking, children can learn to follow instructions, learn problem solving, make predictions and discuss observations. This form of activity conforms to social interaction. Social interaction plays a significant role in the process of cognitive development according to (Vygotsky, 1978)

Preparing the ingredients with your child is the first essential step. Talk about the ingredients in the recipe and practice one to one correspondence. Making a cake involves several procedures like measuring, mixing and baking. Discuss what will happen first, next, after, and last before you start. Let the child have more hands-on experience. Let them reflect on the and think stage by stage.

R2

According to Vygotsky (1978), a child's learning occurs through social interaction with a skillful person such as in this baking activity, the parent. Parents provide verbal instructions for the child. Vygotsky describes this as cooperative or collaborative dialogue, which promotes cognitive development more effectively than direct instruction (Newman, 2021).

Memory Games

Participating in memory games can significantly enhance various cognitive functions, such as attention, concentration, and focus (Siegler, 2018). These games foster critical thinking and help children develop a keen attention to detail. Furthermore, memory games improve visual recognition skills (Peixoto et al., 2018).

For memory games, your child needs to recall items hidden under a cloth. At the end of the game, the revealed objects provide immediate feedback on their memory performance. This approach is both satisfying and challenging, keeping your child engaged and motivated to continue improving.

Prepare pairs of objects such as leaves, pebbles, or small toys that can be covered by half an eggshell. Begin with two to three pairs for a toddler and increase the difficulty as they improve. This game can also be played with single objects to evaluate their memory of specific locations.

-R5

Be mindful of the Zone of Proximal Development (ZPD) and adjust the difficulty level accordingly. If the game is too challenging, the child may become frustrated; if it is too easy, they may become bored, defeating the purpose of the activity.

-R6

According to Piaget, children develop schemas, or mental frameworks, through experiences, and playing a memory game helps them build and reinforce schemas related to memory and recognition. When children encounter familiar images, they incorporate this new information into their existing schemas (assimilation), and when they see new images, they modify their schemas or create new ones (accommodation), enhancing cognitive flexibility (Kula, 2021)

Float or Sink

Preschoolers have a fascinating opportunity to explore fundamental scientific ideas through practical learning with the 'Float or Sink' experiment.

Parents will need a basin or bowl of water along with several objects including a spoon, a leaf, a piece of fruit, and a rock.

-R3

For preschoolers in the Preoperational Stage (2-7 years), the “Float or Sink” experiment introduces foundational concepts that prepare them for future cognitive development as Piaget believed that children learn best through hands-on, exploratory activities. Parents through scaffolding techniques provide support when children make predictions, observe the outcomes and engage in reflective discussions to help them understand the concepts of buoyancy and density.

These activities foster social learning by encouraging children to explore science concepts with adult guidance, reflecting Vygotsky’s ideas about learning through interaction (Silalahi, 2019).

Conclusion

The research of Jean Piaget and Lev Vygotsky has significantly influenced methods and approaches to enhancing children’s cognitive development. Both theorists have made substantial contributions to the field of education by providing explanations for children’s cognitive learning abilities. Despite their differing views on developmental psychology, both Piaget and Vygotsky agree that children actively construct their own knowledge of the world rather than passively absorbing information. Piaget's theory posits that children develop in stages, and the role of the facilitator is to assess their developmental level and set appropriate tasks rather than simply providing information. Conversely, Vygotsky emphasized the crucial role of the facilitator, particularly parents, in teaching through interaction and instruction. According to Vygotsky, the facilitator, who is more knowledgeable, must provide guidance, direction, support, and structure aligned with the child's developmental stages.

This study underscores the significance of these theoretical perspectives in practical applications of cognitive development strategies. By integrating Piaget's and Vygotsky's theories, parents and educators can adopt a balanced approach that promotes active learning and guided instruction. Understanding the developmental stages and the importance of

interaction can help create more effective educational environments that cater to children's individual needs.

The findings of this study highlight the importance of informed facilitation in children's cognitive development. By recognizing and applying the insights from Piaget and Vygotsky, parents and educators can better support children's intellectual growth and learning processes. This research emphasizes the need for a nuanced approach to education that considers both the child's active role in constructing knowledge and the facilitator's role in providing appropriate guidance and support.

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