

Impact of Montessori, Kindergarten and Play-Way Method of Teaching on Pre-School Children: A Teacher's Perspective

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Abstract:

The age of three to eight years also referred to as the pre-school period is the most impressionable and formative years of a children. It is in this period that the cognitive abilities start forming a base and attains a certain level that dictates the intellectual and social future of a child. Hence, pre-school education holds an important responsibility to ensure the cognitive development of a child. This study analyses the three methods of teaching viz. Kindergarten, Montessori and Play-way method and emphasizes on the impact posed by them on the cognitive development of a child. The study was done according to the opinions hold by 301 teachers from the Thrissur district of Kerala. The study established the impact of the three method of education on the internal and external factors affecting cognition of pre-school children.

Keywords: Kindergarten, Montessori, Play-way, cognition, pre-school.

I. INTRODUCTION

Child development is a gradual process of evolution manifested biologically in terms of development in the domains of physique, perception, cognition, communication, emotion and social outlook (Child Development and Early Learning: A Foundation for Professional Knowledge and Competencies, 2015). Early Childhood Development (ECD) referring to the period from birth to primary-school level (eight years) concentrates on health, education, nutrition, social protection and family care (Anderson et al., 2003). The ECD programmes brace up children for formal primary education and significantly impacts cognitive development among other areas

of concern (Rao N, 2014). Cognitive development can be interpreted by the prospering competence in language skills (Adesope, Lavin, Thompson, & Ungerleider, 2010) and problem-solving and decision making abilities (Vandenbroucke, Spilt, Verschueren, Piccinin, & Baeyens, 2017), etc. in the progress from childhood to adolescence. Preschool introduces children to a structured learning environment that is inclusive of classroom, learning equipment, shared interior and exterior spaces, etc. (Elizabeth & Capies, 2016). Academic efficiency and behavioural revelations is indicative of the extent of cognitive development in pre-schoolers. This 'try age' facilitates the learning of new skills by the method

of observing and doing (Dhingra, Manhas, Raina, Coates, & Sanoff, 1972). Thus it becomes imperative for pre-schools to adopt effective methods to ensure the complete development of a child.

The factors effecting cognitive development of children can be studied as biological, environmental, socio-cultural, responses to stimuli etc. Communication and interaction with the surrounding with the use of sense organs through eye contact, body movement, sounds, and facial expression enhanced through play methods such as use of colourful blocks improve cognitive proficiency in children (Epstein, 1980). Research reveals that cognition is inherited through genetic factors and advances with the age often till ten years (Briley & Tucker-Drob, 2017). However, mental and motor maturity pose a direct influence in the improvement of cognitive adequacy in children (Luna & Sweeney, 2001). The cultural exposure and social interplay direct children in their reasoning and problem-solving processes (Shute & Slee, 2015). Children exposed to healthy parent-child interactions and a conducive teacher-student relationship bears improved critical thinking skills, abilities in problem-solving and better self-control (Landry, 2017). Pre and post-natal considerations like mother's body mass index, feeding and dietary intake impacts cognitional ability of the child in the first two years (Nurliyana, Mohd Shariff, Mohd Taib, Gan, & Tan, 2016). Physical activities (Bidzan-Bluma & Lipowska, 2018), playing exercises (Ahmad, Ch, Batool, Sittar, & Malik, 2016) and sleeping patterns (Kocevska et al., 2017) also has a considerable impact on the cognitive development of children. As such, the child centric ECD programmes focussing on healthy family atmosphere, educational interventions, socio-cultural influences can impose a positive essence on a child's cognitive development (Rao N, 2014).

Education attempts to convey knowledge, sharpen skills, and elevate the potentialities

through involves systematic training and instructions. It is dedicated to the development of a child's physical, emotional, social and cognitive proficiency. The three leading methods of imparting pre-school education are the Kindergarten, the Montessori, and the play-way approach (Manisha & Sunita, 2013).

The most common approach adopted for pre-school education is the Kindergarten method (Synodi, 2010). This traditional method of education ensures the fulfilment of the concept of 'education is basic right of every child'. It endeavours in delivering the message and practice of self-activity, social involvement, freedom in education, learning by playing, and discipline by the means of love (Tahir, Abbas, Rizvi, Ghazali, & Saleem, 2013). The scientific approach of Montessori method focuses on enhancing the childlike social, emotional, physical and intellectual skills through observation, discovery and purposeful activity (Marshall, 2017). It differs from the kindergarten method in the way education is imparted; It is a way of instruction compared to the kindergarten method which is a way of education (Tahir et al., 2013). In this system children are given the liberty to progress at their own pace by the exposure to a pre-defined, age specific learning tool (Isaacs, B., Green, 2007). The basis of play-way method is the concept of 'learn through play' (Nadeem, Jabeen, & Bilquees, 2013). It collates the best practices from all over the world and emphasizes on the importance of physical activities in the likes of dance, craft work, arts, storytelling, music and pretend play (Prochner, 2002).

Preschool education decides the strength of the social, academic and intellectual base of a child as this covers the initial formative years of the children. It is hence an essential step to analyse the efficiency of the existent modules of preschool education and assess the process (opportunities of learning, health, etc.), configuration (size of

group, teacher-child ratio, qualification of teachers) and the quality of preschools. This research aims to study the impact of the three methods from the viewpoints and context of teachers. The objectives attempted to attain through this work are; (i) to investigate the methods of instruction adopted in pre-school education, (ii) to study the influence of the Kindergarten, Montessori, and Play-way methods on the internal aspects impacting cognition such as the personality, motivation, health and family relationships in children, (iii) to study the influence of the Kindergarten, Montessori, and Play-way methods on the children's response to external aspects impacting cognition such as physical environment, sociocultural influences, and classroom learning. The following null hypotheses have been tentatively formulated based on the research objectives mentioned above.

- *H1: Teaching methods have an impact on the personality, motivation, health, and family bonding of children.*
- *H2: Teaching methods have an impact on the physical surroundings, social factors, cultural factors, and school learning of children*

II. METHODOLOGY

The first step in the methodology involves the formulation of objectives and research questions, followed by the assessment of research strategy signifying the quantitative method to be followed. The present study uses the advantage of practicality and easy accessibility of the questionnaire method in collecting data. The questionnaire was well-structured with questions about the perceptions of teachers about impact of the method adopted on the internal aspects (personality, health, family bonding) influencing cognition, external aspects (external environment, social and cultural factors etc.) influencing cognition and their impacts on various cognition levels such as problem solving, logical thinking etc. on the pre-school students. The responses

were analysed for results. 301 teachers from the Thrissur District of Kerala were taken as respondents for the study.

The demographics and related data from the questionnaires were tabulated using frequency calculation. The perception of teachers on the impact of internal and external aspects on cognition was analysed using descriptive analysis. The dependability of the study tool was validated using Cronbach's Alpha that estimated the internal consistency of the questionnaire items. The relevance of the aspects on pre-school education was analysed by Exploratory Factor Analysis using Kaiser-Meyer-Olkin (KMO) and Bartlett's Tests of Sphericity. The study utilised the method of MANOVA to establish the validity of the hypotheses.

III. RESULTS AND DISCUSSION

The respondents' data were presented in tabulated form to ascertain the association between variables considered and arrive at inferences regarding cognitive development of children at pre-school level with Montessori, kindergarten and play-way methods of teaching. It was also evaluated from the responses that the teachers were almost equally trained in the three methods of teaching with Kindergarten method (37.9%) leading the Montessori (32.9%) and Play-way method (29.2%) by a slight margin. Table 3.1 reveals that the majority of the respondents (25.6%) in the study were found to have completed nursery teacher training course (NTTC) giving an impetus to the validity of the study. The teaching experience of the maximum number of teachers (70%) ranged between 5-15 years inferring that they had a clarity in the understanding of the situation with teaching experience of more than 5 years and also were uptodate with the recent developments in the method of teaching within the last 10-15 years.

Table 3.1: Education of the respondent

Education	Frequency	Percent
DPPTTC	36	12.0
DME	54	17.9
PGDM	43	14.3
NTTC	77	25.6
TTCM	41	13.6
B. Ed	42	14.0
M.Ed	8	2.7
Total	301	100.0

The respondents were equally distributed among the three methods of teaching; Kindergarten (32.9%), Montessori (33.2%) and Play-way method (33.9%). It infers that all the three methods were adopted for imparting education to the pre-schoolers.

Respondents faced questions for the analysis of their perceptions towards the impact of the methods of teaching on the internal and external aspects impacting cognition of pre-schoolers. All the questionnaire items in this section were analysed using a five-point Likert scale, where 1 =

strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. Teachers' perception on the impact of the three methods of teaching on internal aspects of cognition was divided into four factors viz. Personality, Motivation, Health and Family bonding. External aspects were divided into Physical surroundings, Social Influence, Cultural Factors and School Learning. The analysis revealed the Cronbach's alpha value to be (> 0.8) for all the items, signifying that all the items could be retained.

Internal aspects influencing cognition

Among the internal aspects impacting cognition, twenty one factors grouped into four main factors were extracted with Eigenvalue >1 that explained 75% of variance in the data. Among the various factors that were measured, Personality was found to be the most important factor as it explained 58.306% of the variance. Teachers accepted Kindergarten method to be imposing the maximum impact on internal aspects of Personality ($M=3.764\pm0.778$) and Motivation ($M=3.961\pm0.769$) and strongly believed to have an impact on Health ($M=4.152\pm0.824$) and Family bonding ($M=4.291\pm0.836$).

Table 3.1: Descriptive for study variables

Internal influences of teaching	Method of teaching	Mean	Std. Deviation	N
Personality	Kindergarten	3.764	0.778	99
	Montessori	3.562	0.769	100
	Play Way	3.522	0.651	102
	Total	3.615	0.740	301
Motivation	Kindergarten	3.961	0.842	99
	Montessori	3.505	0.820	100
	Play Way	3.757	0.694	102
	Total	3.740	0.806	301
Health (Physical and mental)	Kindergarten	4.152	0.824	99
	Montessori	3.674	0.813	100
	Play Way	3.802	0.851	102
	Total	3.874	0.851	301
Family Bonding	Kindergarten	4.291	0.836	99
	Montessori	3.670	0.826	100
	Play Way	4.055	0.774	102

Internal influences of teaching	Method of teaching	Mean	Std. Deviation	N
	Total	4.005	0.849	301

As per the result obtained from Table 3.2, different methods exerted a significant influence on internal aspects with Wilks' Lambda = 0.852, $F(8,590) = 6.146$, and $p < 0.05$. In the present case, the value is 0.852, meaning that about 85.2% of the variation in the internal aspects is not on account of the methods. This indicates that about 15% of the variation in internal aspects is explained by the three methods. According to the results of table 3.3, Personality accounted for 2%

($R^2 = .020$, $F(2) = 3.113$, $p < 0.05$), Motivation accounted for 5.3% ($R^2 = .053$, $F(2) = 8.390$, $p < 0.05$), Health accounted for 5.6% ($R^2 = .056$, $F(2) = 8.831$, $p < 0.05$) and Family bonding accounted for 9.1% ($R^2 = .091$, $F(2) = 14.829$, $p < 0.05$) of total variation. Thus, the hypothesis *H1: Teaching methods have an impact on the personality, motivation, health, and family bonding of children is accepted.*

Table 3.2: Multivariate Tests - Wilks' Lambda

Effect	Value	F	df	Sig.	Partial Eta Squared
Method of teaching	0.852	6.146	8, 590	0.000	0.077

Table 3.3: Test between subject effects

Source	Internal influences of teaching	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Method of teaching	Personality	3.358	2	1.679	3.113	0.046	0.020
	Motivation	10.398	2	5.199	8.390	0.000	0.053
	Health (Physical and mental)	12.154	2	6.077	8.831	0.000	0.056
	Family Bonding	19.569	2	9.785	14.829	0.000	0.091
R Squared = .020 (Adjusted R Squared = .014)							
R Squared = .053 (Adjusted R Squared = .047)							
R Squared = .056 (Adjusted R Squared = .050)							
R Squared = .091 (Adjusted R Squared = .084)							

External aspects influencing cognition

Among the external aspects impacting cognition, twenty factors grouped into four main factors were extracted with Eigenvalue >1 that explained 78% of variance in the data. Among the various factors that were measured, Physical surroundings were found to be the most important

factor as it explained 67.066% of the variance. Teachers strongly accepted Kindergarten method to be imposing the maximum impact on external aspects of Physical Surroundings ($M = 4.113 \pm 0.851$), Social Influence ($M = 4.066 \pm 0.940$) and Cultural Factors ($M = 4.081 \pm 0.922$) while accepted it to have an impact on School Learning ($M = 3.960 \pm 0.908$) too.

Table 3.4: Descriptive statistics for study variables

Internal influences of teaching	Method of teaching	Mean	Std. Deviation	N
Physical Surroundings	Kindergarten	4.113	0.851	99
	Montessori	3.435	0.854	100
	Play Way	3.941	0.707	102
	Total	3.829	0.853	301
Social Influence	Kindergarten	4.066	0.940	99
	Montessori	3.283	0.908	100
	Play Way	3.904	0.811	102
	Total	3.751	0.946	301
Cultural Factors	Kindergarten	4.081	0.922	99
	Montessori	3.234	0.951	100
	Play Way	3.769	0.827	102
	Total	3.694	0.963	301
School Learning	Kindergarten	3.960	0.908	99
	Montessori	3.328	0.788	100
	Play Way	3.710	0.703	102
	Total	3.665	0.841	301

As per the result obtained from Table 3.5, different methods exerted a significant influence on external aspects with Wilks' Lambda = 0.845, $F(8,590) = 6.499$, and $p < 0.05$. In the present case, the value is 0.845, meaning that about 84.5% of the variation in the internal aspects is not on account of the methods. This indicates that about 16% of the variation in internal aspects is explained by the three methods. According to the

Learning accounted for 9.5% ($R^2 = .095$, $F(2) = 15.620$, $p < 0.05$) of total variation. Thus, the hypothesis *H2: Teaching methods have an impact*

results of table 3.7, Physical Surroundings accounted for 11.3% ($R^2 = .113$, $F(2) = 19.063$, $p < 0.05$), Social Influence accounted for 12.7% ($R^2 = .127$, $F(2) = 21.615$, $p < 0.05$), Cultural Factors accounted for 13.1% ($R^2 = .131$, $F(2) = 22.508$, $p < 0.05$) and School

on the physical surroundings, social factors, cultural factors, and school learning of children is accepted.

Table 3.5: Multivariate Tests - Wilks' Lambda

Effect	Value	F	df	Sig.	Partial Eta Squared
Method of teaching	0.845	6.499	8, 590	0.000	0.081

Table 3.6: Test between subject effects

Source	Internal influences of teaching	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Method of teaching	Physical Surroundings	24.780	2	12.390	19.063	0.000	0.113
	Social Influence	34.048	2	17.024	21.615	0.000	0.127
	Cultural Factors	36.540	2	18.270	22.508	0.000	0.131
	School Learning	20.154	2	10.077	15.620	0.000	0.095
R Squared = .113 (Adjusted R Squared = .107)							
R Squared = .127 (Adjusted R Squared = .121)							
R Squared = .131 (Adjusted R Squared = .125)							
R Squared = .095 (Adjusted R Squared = .089)							

IV. DISCUSSION

The present study was done to analyse the adequacy of Montessori, Play-way and Kindergarten methods of teaching on the development of cognitive abilities of children. Studies have previously figured some factors affecting cognition. Pem (2015), Dai and Heckman (2013), Linver, Brooks-Gunn and Kohen (2002) identified maternal nutrition, child nutrition and dietary status, parental behaviours, family processes, social, cultural and environmental factors to be influencing child development leading to a healthy cognition. Burger (2010) and Loeb, Bridges, Bassok, Fuller, et al. (2007) established the importance of early childhood education programs and pre-school centres on the cognitive abilities of children. The study goes in pace with the fore mentioned studies in considering the factors of cognition which have been broadly divided into the internal and external factors of cognition. The internal factors contributing to the study are personality, motivation, health and family bonding and they explained 75% of cognitive variability. The external factors were environment, social and cultural factors, and school aided learning and they explained 78% of variation.

The study established the impact of pre-schooling method of teaching on the cognitive development of children. Although the impact was

found to be less it was found to be a significant value of 15% for internal factors and 16% for external factors. Among internal factors, proper method of teaching was seen to have a notable effect on family bonding (9.1%) and improved their interaction with parents and relationship with siblings. Cultural factors faced a weighty influence (13.1%) among the external factors encouraging children to participate in various activities and to garner a positive attitude towards education. Kindergarten method of teaching was opined to have influenced the maximum impact. These results can be related to the studies of Abbas, Ansari and Rizvi (2015) who studied the development of civil and linguistic skills in children of Montessori and Kindergarten education, Gormley, Gayer, Phillips and Dawson (2005) who established the efficiency of pre-kindergarten programmes in increasing the cognitive outcomes of children and Kumar, Asokan, John and Gopalan (2015) who emphasized on play-way method in encouraging awareness about important issues.

V. CONCLUSION

The characteristics of a preschool program determine the child's intellectual and civil skills. It holds the basis of the child's future academic and social mannerism in later classes. Different elements sub classed into two broad division impact the cognitive development of the child.

The internal aspects comprise of the personality, motivation, health and family bond while the external aspects are inclusive of physical surroundings, cultural factors, social factors, school learning etc. These aspects comprises of the early education module undertaken to enhance a child's cognitive ability. Amidst a diverse range of choices, it becomes imperative to comprehend the relevance of kindergarten, Montessori, and play-way approaches to pre-school education. Further, it also becomes a priority to acknowledge the way in which these methods of education pose an impact on the cognitive development of young children. This study tries to provide a balancing observation of these three prominent methods of educational approach.

The study significantly attempts to interpret the role of these educational methods in emphasizing the aspects of child cognition and ensuring a brighter educational and social future for children. It was found from teachers' viewpoint that the Kindergarten, Montessori and play-way method had a significant impact on the internal and the external aspects of cognitive development. Hence, it becomes a responsibility to choose the appropriate method of pre-school education for children. The study was restricted Thrissur district of Kerala, thus lacking generalization. In the future course of study this may be extended to a wide area. Moreover, only teacher's perspective was taken into account. To attain a better clarity, parents and students of higher section may also be included in the future work.

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