

SPECIMEN FORMAT FOR THESES OF MONTH

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Abstract within 300 words:

The early years of a child's life are crucial for holistic development, laying the foundation for physical, cognitive, emotional, and social growth. Between ages 3 and 8, children acquire essential skills that influence their academic success and lifelong learning. Recognising this, Early Childhood Care and Education (ECCE) has gained global and national focus. In India, the National Education Policy (NEP) 2020 prioritises universal access to quality ECCE and foundational literacy and numeracy. Despite this, significant gaps remain in ECCE delivery, with issues of quality, access, and equity hindering children's development. The major challenge is the lack of developmentally appropriate, culturally responsive pedagogical framework to support Emergent Literacy and Numeracy, essential skills of school readiness.

The systematic review conducted in the initial stage using the PRISMA model substantiates the critical and persistent challenges in India's ECCE system, underscoring a significant disconnect between ECCE policy intentions and on-ground implementation. The findings pointed towards actionable reforms in terms of DAP's five key dimensions as outlined by the National Association for the Education of Young Children (NAEYC). Henceforth, adopting DAP is not just a pedagogical choice, but a strategic imperative to achieve equitable, inclusive, and high-quality early education in India.

The study was conducted in two sequential phases. Phase I employed a cross-sectional design with 281 children, aged 3 to 6 years, from five private ECCE centres in Coimbatore District of Tamil Nadu. An "Emergent Literacy and Numeracy Assessment Pack," adapted from the North Carolina Kindergarten Common Core Standards (2017), was used to assess skills. Phase II employed a "Before and After with Waitlist Control Group" design with 62 children. A DAP-based curriculum framework was developed and implemented over 70 working days.

The key findings revealed that except for Listening comprehension, all indicators of Emergent Literacy and Numeracy showed significant positive effects following the DAP-based intervention. Thus, the developed DAP-based curriculum framework holds strong potential to bridge existing gaps and significantly enhance preschoolers' skills, aligning with SDG 4 by promoting inclusive, equitable, and quality early education.

i) Major objectives :

Primary objective:

To formulate a Developmentally Appropriate Practice (DAP)-based curriculum framework focused on Emergent Literacy and Numeracy Skills for 3-6-year-old children.

Secondary objectives:

- To understand the extent of acquisition of Emergent Literacy and Numeracy Skills of the selected preschoolers with the existing pedagogical framework.
- To examine the influence of socio-demographic factors on the existing levels of Emergent Literacy and Numeracy Skills of the selected preschoolers and
- To implement and evaluate a Developmentally Appropriate Practice (DAP)-based curriculum framework focused on enhancing the Emergent Literacy and Numeracy Skills of the selected preschoolers

ii) Hypothesis:

- ✓ H₀1: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Phonological awareness.
- ✓ H₀2: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Print awareness.
- ✓ H₀3: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Listening comprehension.
- ✓ H₀4: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Alphabet writing capacity.
- ✓ H₀5: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Number writing capacity.
- ✓ H₀6: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Number and operation skills.
- ✓ H₀7: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Data analysis and measurement abilities.
- ✓ H₀8: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Algebra and pattern-making skills.

- ✓ H₀9: The Developmentally Appropriate Practice (DAP)-based curriculum has no significant effect on preschool children's Geometry and spatial awareness.

iii) Methodology :

The methodology of the study comprised two phases and adopted a mixed-method research design. Phase I employed a cross-sectional research design, while Phase II followed a before-and-after design with a waitlist control group.

Phase I: Assessing current levels of Emergent Literacy and Numeracy Skills

Population and Sampling: A total of 25 private run preschools from all five zones of the Coimbatore District of Tamil Nadu were shortlisted. These preschools were either standalone preschools or preschool attached to private schools and were found to follow either a prescribed or a practice-based curriculum. Out of 25 preschools only 5 preschools expressed their willingness to participate and these schools had a total of 281 preschool children for whom the parental assent was procured to be associated with the study. Henceforth, the population was 281 preschoolers.

Tool Selection/ Construction: For Phase I, a total of two tools were used to get the necessary data from preschoolers. First, a self-formulated general background questionnaire to get the personal and parental profile of the preschoolers. Second, a Modified Literacy and Numeracy Assessment Pack which was a modified version of Kindergarten Common Core State Standards of North Carolina (2017). The pack comprised of two content areas namely, Emergent Literacy and Numeracy Skills. The Emergent Literacy Skill had two indicators, Reading (11 items) and Writing Skills (2 items) with a total of 13 items. The indicators of Reading Skills were Print Awareness, Listening Comprehension and Phonological Awareness Skill and for Writing Skills, the indicators were Alphabet Writing and Number Writing. The Emergent Numeracy Skills had four indicators namely Numbers and Operations (4), Data analysis and Measurement (1), Algebra and Pattern-making (1), Geometry and Spatial Awareness (3) with a total of 9 items. As the pack was modified to hold good on the Indian context, the content was validated and it was pilot tested.

Conduct of the Study: Permissions were obtained, parental assent was secured, and rapport was built with schools, teachers, and children. Background data were collected, and the validated Emergent Literacy and Numeracy Assessment Pack was administered to 281 preschoolers. The assessment process took around 2 months, as each assessment required at least 15 minutes per child and was carried out for 2 hours daily.

Analysis of Data: Percentage analysis was computed to depict the socio-demographic markers of the selected preschoolers and also to understand the level of Emergent Literacy and Numeracy Skills of the selected preschoolers.

Phase II: Formulating, Implementing, and Evaluating a DAP-based Curriculum Intervention

Population and Sampling: From the 5 identified preschools, 4 schools provided consent and agreed to allocate specific structured hours over a three-month period for implementing the DAP-based curriculum framework. These four preschools were divided into two groups: an experimental group and a control group, each comprising two preschools. Accordingly, a total of 62 preschoolers participated in the intervention process, with 31 assigned to the experimental group and 31 to the control group children under the age ambit of 4-5 years.

Tool Selection/ Construction: For this Phase, a DAP-based curriculum framework was designed exclusively for preschoolers aged 3-6 years to suit to the Indian context. This framework was formulated based on the globally recognized High Scope and Head Start curriculum. The blue print of the framework was developed by identifying content areas and indicators, setting learning objectives, outlining milestones, designing learning pedagogy, and establishing methods for observation and evaluation. Each of these components of curriculum were formulated based on the needs and context of Indian children. After subjecting the blue print for expert evaluation for content validity, the elaborate lesson plans for each of the objective was also developed.

Although the framework was framed for children aged 3-6 years, owing to the time restrictions the framework was planned to be tested only with children of 4-5 years. The other reasons of getting the framework tested with 4-5 years old children were their regular attendance in class when compared to pre - KG classes as this age group are considered to be the foundational stage of kindergarten. To implement the formulated curriculum for children of 4-5 years. The educators of the selected experimental schools (2) were trained over a period of 7 days. Then, the formulated focused DAP based curriculum framework was implemented in the classroom by the trained educators. The implementation process was for 70 working days, with 1 session per day (a total of 70 sessions, 70 hours), and was monitored by the researcher.

Data Analysis: For the Phase II, ANCOVA was computed to compare differences in mean score on preschoolers Emergent Literacy and Numeracy Skills between experimental and control groups of respondents and to check if the formulated DAP based curriculum effect differs by time

measures (Pre and Post) with an overall objective of evaluating the effectiveness of the formulated DAP based curriculum in enhancing preschoolers Emergent Literacy and Numeracy Skills.

iv) Findings:

The key findings were projected within the two phases:

Phase I: Assessing current levels of Emergent Literacy and Numeracy Skills

The results of Phase I were discussed as per the subheads specified below.

- A. General profile of the selected preschoolers
- B. Categorisation of the preschoolers based on the existing gradations of Emergent Literacy and Numeracy Skills
- C. Association between the socio-demographic markers and the Emergent Literacy and Numeracy Skills of the selected Preschoolers

A. General profile of selected preschoolers

A great majority (55%) of the respondents were within the age group of 4 to 5 years, while 35% belonged to the 5 to 6 years category. Among them, 52% were first-born children and 48% were later-born. With respect to gender, 54% of the preschoolers were male and 46% were female. Regarding the type of ECCE centres, 33% were enrolled in prescribed preschools, whereas 67% attended practice-based centres. Family structure analysis revealed that 77% of the children were from nuclear families and 23% from joint families. In terms of parental education, most fathers were graduates (43%), with only 13% having completed post-graduation. Among mothers, 32% had completed higher secondary education, 20% were undergraduates, and only a small proportion held postgraduate qualifications. Occupational details showed that 43% of fathers and 24% of mothers were engaged in business activities, while 39% of mothers were homemakers. Additionally, 41% of fathers and 25% of mothers were employed in the private sector, whereas 16% of fathers and 12% of mothers worked in the government sector.

B. Categorization of the preschoolers based on the existing gradation of Emergent Literacy and Numeracy Skills

This sub-stage analysis reveals that out of the total 9 indicators two indicators namely Listening Comprehension and Number Writing indicates that the practices adopted by the educator were much appropriate to foster these skills. A Few preschoolers in age group of 3-4 years and 4-5

years were in the gaining stage in print awareness, mastery level in phonological awareness and Alphabet writing and approaching at all indicators of Numeracy Skills. However, more than 1/4 th of the preschoolers of 5-6 years were still in the initial stages of Print Awareness, frustration level in Phonological Awareness, basic grade in Alphabet Writing and just approaching in all indicators of Numeracy Skills

C. Association between the socio-demographic markers and the Emergent Literacy and Numeracy Skills of the selected Preschoolers

This subhead summarises the relevant statistical output of one- way ANOVA, showing the assessment of the chosen socio-demographic markers and the selected preschoolers' Emergent Literacy and Numeracy Skills.

- a. Influence of Gender
- b. Influence of Birth Order
- c. Influence of Type of family
- d. Influence of Type of ECCE Centre enrolled
- e. Influence of Parental Educational Status
- f. Influence of Parental Occupational Status

a. Influence of Gender

The ANOVA statistics shows that the gender does not have a significant impact on preschoolers Emergent Literacy and Numeracy skills.

b. Influence of Birth Order

Listening Comprehension of Emergent Literacy Skills ($F(1,279)=2.804$ and $p=.095$) and the ability in Number and Operation of Emergent Numeracy Skills ($F(1,279) = 4.751$ and $p=.031$) alone varied significantly based on birth order with first born scoring higher than their counterparts

c. Influence of Type of family

Emergent Literacy and Numeracy Skills of the preschoolers is independent of the type of family that the preschoolers hail from

d. Influence of Type of ECCE Centre enrolled

All the indicators of Writing Skills (Alphabet Writing and Number Writing with, $F(1,279)=4.053$ and $p=.040$ and $F(1,279)=4.642$ and $p=.032$ respectively) were significantly

associated with the type of preschool with preschoolers from prescribed preschool reporting enhanced score. Similarly, on the indicators of Emergent Numeracy Score the ability in Number and Operation ($F(1,279) = 4.247$ and $p=.030$) alone varied significantly based on their type of preschool with prescribed preschool taking in a better position.

e. Influence of Parental Educational Status

Number Writing of Emergent Literacy Skills ($F(4,276)= 3.884$ and $p=.004$) and two indicators of Numeracy Skill namely, Geometry & Spatial Awareness ($F(4,276) = 3.089$ and $p=.016$) and Algebra & Pattern making ($F(4,276) = 5.215$ and $p=.000$) was significantly associated with the fathers educational status, with preschoolers of Postgraduate fathers obtaining a higher score when compared to their counterparts.

However, Mother's educational status was found to have a significant association with Listening Comprehension and Phonological Awareness of Emergent Literacy Skills ($F(4,276)= 3.330$ and $p=.011$, $F(4,276)= 2.707$ and $p=.031$ respectively) and Algebra & Pattern making of Numeracy Skill ($F(4,276)= 2.890$ and $p=.023$) with preschoolers whose mothers were postgraduates performed better than their counterparts.

f. Influence of Parental Occupational Status

Print Awareness alone was significantly associated with Father's occupational status of the selected preschoolers ($F(4,276)= 3.549$ and $p=.030$), with preschoolers of fathers employed in private sector performing better than their counterparts.

While, Mothers occupational status was significantly associated with only one indicator of Reading Skills, the Listening Comprehension ($F(4,276)= 2.926$ and $p=.034$) and two indicators of Numeracy Skills namely, Geometry & Spatial Awareness ($F(4,276)= 2.994$ and $p=.031$) and Algebra & Pattern making ($F(4,276)= 4.380$ and $p=.005$). with children scored mothers working in the government sector scoring higher.

Phase II: Formulating, Implementing, and Evaluating a DAP-based Curriculum Intervention

The key findings were provided based on the Content areas and its indicators as given below:

A. Effectiveness of DAP-based curriculum framework in enhancing Emergent Literacy Skills of selected Preschoolers

Print Awareness: The ANCOVA analysis showed that the experimental group of respondents had an enhanced mean score $\{M(SD) = 15.238 (.272)\}$ when compared to control group $\{M(SD) = 13.472 (.272)\}$. Further, the ANCOVA summary also showed a significant effect of intervention in the form of DAP based ECCE curriculum with the η^2 showing a low to moderate effect (0.249), hence a variance of 25%. The pairwise comparison further substantiates that the experimental group of respondents significantly had better score on Print awareness compared to the control group of respondents.

Phonological Awareness: The preschoolers of the experimental group showed higher mean score $\{M(SD) = 44.375 (.940)\}$ when compared to control group $\{M(SD) = 20.109 (.940)\}$. Consequently, the ANCOVA summary in terms of η^2 showed high effect size of 78%. In addition, the pair-wise comparisons portrayed a significant augmented score of the experimental group when compared to the control group of respondents. Hence the DAP based ECCE curriculum thus formulated and implemented was effective in the indicator - Phonological Awareness.

Listening Comprehension: The score of the experimental group was slightly augmented compared to the control group but not statistically significant. A slight increase in scores, suggest that the preschoolers naturally develop their Listening Comprehension Skills with the existing pedagogy. Also, the finding of subphase 1 had shown that around 83% of the preschoolers had mastered the Listening comprehension with the existing pedagogy and thus the increase in the mean score of the experimental group of respondents was minimal.

Alphabet Writing: The mean scores showed that the preschoolers from experimental group showed higher mean score $\{M(SD) = 7.585 (.172)\}$ when compared to control group $\{M(SD) = 6.447 (.172)\}$. Further, the ANCOVA summary showed significant effect of the formulated DAP based ECCE curriculum framework on the Emergent writing score in terms of η^2 showing low to moderate effect size of 26% variance explained by the intervention. Also, pair-wise comparisons demonstrated that preschoolers from experimental group scored better than their cohort.

Number writing The ANCOVA analysis showed that the preschoolers in the experimental group showed improvement in Number Writing compared to those in the control group $\{M(SD) = 22.970 (.808)$ and $M(SD) = 12.965 (.808)$ respectively}. Similarly, the ANCOVA summary in terms of η^2 value (0.547) indicates a large effect size for the formulated DAP-based ECCE curriculum

framework. This suggests that 55% of the variance in the pre- and post-test scores for Number Writing can be attributed to the intervention. Also, pair-wise comparisons demonstrated the same.

B. Effectiveness of DAP-based curriculum framework in enhancing Emergent Numeracy Skills of selected Preschoolers

Number and Operation: The results demonstrated that the experimental group of respondents had an enhanced mean score when compared to control group $\{M(SD) = 19.174 (.342)$ and $M(SD) = 15.890 (.342)$ respectively}. The result of significant ANCOVA summary revealed a η^2 value of 0.434, indicating that the effect size was between low to moderate. This value suggests that 43% of the variance in the Number and Operation scores (pre- and post-test) can be attributed to the intervention. The effectiveness of the intervention was further substantiated by the significant pair-wise comparison scores.

Data Analysis and Measurement: Preschoolers from experimental group had an enhanced mean score $\{M(SD) = 7.315 (.134)\}$ when compared to control group and $\{M(SD) = 5.330 (.134)\}$. Also, the ANCOVA summary shows that, there was a significant effect of DAP based ECCE curriculum on the Data Analysis and Measurement. The η^2 value (0.649) indicating a large effect size, suggested that 65% of the variance in the pre- to post-test scores of experimental group is caused by the implementation of the DAP-based curricular framework.

Algebra and Pattern-making: The result confirms that preschoolers in the experimental group achieved noticeably higher mean scores when compared to their peers in the control group $\{M(SD) = 17.787 (.376)$ and $M(SD) = 14.342 (.376)$ respectively}. Also, the ANCOVA summary shows that, there was a significant effect of the formulated DAP based ECCE curriculum on the Algebra and Pattern-making. According to Cohen's guidelines, it can be seen that for DAP based ECCE curriculum the effect size was between low to moderate (0.414). Also, the pair-wise comparisons confirmed that the experimental group of respondents had an augmented score compared to the control group of respondents.

Geometry and Spatial awareness: The ANCOVA analysis showed that the preschoolers in the experimental group were better $\{M(SD) = 7.365 (.161)\}$ when compared to the control group $\{M(SD) = 5.990 (.161)\}$. Also, the ANCOVA summary had revealed that there was a significant effect of DAP based ECCE curriculum on Geometry and Spatial awareness. The η^2 showed a variance of 54% that is explained by the intervention. Pair-wise comparisons also show that the preschoolers from experimental group scored better than their cohort.

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