

Parental Education and its Impact on Children's School Adjustment and Mathematical Reasoning

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Abstract

Parental education is one of the most visible predictors of children's socio-emotional and academic trajectories, though its influence on their school adjustment and mathematical reasoning is rarely examined together. This review is intended to synthesize theoretical and empirical literature about how parental education level influences adaptation of children at school and their mathematical thinking. There are several pathways through which parental education influences their children's academic behaviour, home environment stimulation for mathematical tasks, and educational expectations. Literature evidence shows that higher parental education is associated with richer home numeracy and literacy environments. More homework involvement, and smooth behavioural and emotional adjustment to school are also positively correlated to higher parental education, whereas lower parental education is associated with socioeconomic disadvantage and lack of access to resources for their children both at home and school. The review is particularly focussed in Indian context covering the National Education Policy 2020 and its emphasis on foundational literacy and numeracy, implications of parental involvement, teacher practices, and policy interventions.

Keywords: parental education, school adjustment, mathematical reasoning, parental involvement, NEP 2020.

Introduction

The attitudes, behaviors and resources that are prevalent in the family have a significant impact on children's academic success when admitted to their first school. Parental education has been one of the strong influencing factors of children's adjustment and achievement at school, which in turn guides the cognitive ability to comprehend quantity, pattern, and logical structure necessary for numeracy and higher mathematics (Hill, 2001). School adjustment covers children's school liking, cooperative participation, self-directedness, and adaptive behaviour (Ladd, 1996). It is a bidirectional fit between the child's characteristics and the demands of the school system (Birch & Ladd, 1997). On the other hand, the meaning of mathematical reasoning is not always clearly defined, as it is often assumed that everyone understands what it is (Jeannotte & Kieran, 2017). It forms the foundation of logical thinking, problem-solving, and sound decision-making (Hadi et al., 2025). Mathematical reasoning is shaped by the quality of mathematical input provided at home in terms of informal number-related interactions throughout the early years before school (LeFevre et al., 2009 & Levine et al., 2010). Parents with higher levels of education are more likely to influence literacy and numeracy behaviour of children as they possess a better understanding of child development and hold higher educational aspirations, and feel less anxious to academic content, especially mathematics (Maloney et al., 2015; Pinquart & Ebeling, 2020).

Research Questions

1. How does parental education influence children's school adjustment?
2. How does parental education shape mathematical reasoning other than general academic achievement?
3. What are the implications for research and practice in the Indian context following the National Education Policy 2020.

According to Bronfenbrenner's (1989) ecological systems theory, the child's early development is placed within nested environmental systems: the microsystem (family, school), mesosystem (family-school linkages), exosystem (parental workplace, community resources), and macrosystem (cultural values and socioeconomic structures). In addition to influencing the immediate home environment, parental education also reflects influence at the microsystem and macrosystem levels as well.

Hoover-Dempsey and Sandler (1995) suggests that parents engage in their children's education. This engagement of parents is influenced by their understanding of role playing, and confidence in helping their child to succeed. The involvement of parents is manifested through encouragement, modeling, reinforcement, and direct instruction (Green et al., 2007). The level of parental education is a significant indicator of both role understanding and self-efficacy of parents to guide their children, because highly qualified parents feel more capable of navigating academic content and engaging with schools. There are six types of parental involvement in learning of children at home: parenting, communication, volunteering, home-based learning, decision-making, and community collaboration (Epstein, 1995). On the other hand, the home numeracy environment (HNE) model describes the daily numerical activities, resources, and parental attitudes that directly foster mathematical skills (LeFevre et al., 2009). A considerable amount of research indicates that parental engagement and education contribute to smoother transitions into formal schooling. The activities in which parents are engaged with their children at home are more influential than other factors on achievement and adjustment (Desforges & Abouchar, 2003). Parental involvement, relationships with the teachers and peers helps their children in adjustment in school through enjoyment, cooperation and participation. In this way parental engagement serves as a protective factor against early adjustment challenges.

There is a consistent positive correlation between parental involvement and student performance (Fan & Chen, 2001). In particular, parental involvement is found to be more beneficial to the minority children for their academic success, indicating that the effect is not limited to a specific cultural group (Jeynes, 2003). A more recent research of Pinquart and Ebeling (2020) shows that the parental educational expectations demonstrate moderate to strong link with their wards academic success.

Role of Parents in School Adjustment and the Family-School Interaction

In addition to direct behavioral engagement, the education level of parents seems to affect adjustment through the psychological mechanisms outlined in the Hoover-Dempsey and Sandler model. Parents with higher educational levels express greater confidence in their ability to support their children's academic affairs and view their role as active co-educators, rather than solely relying on the school (Green et al., 2007; Hoover-Dempsey & Sandler, 1997). In this way, parental education influences the coordination between home and school. Educated parents are capable of engaging with teachers and understand the demands of school (Crozier & Reay, 2005). They can protect their children from the pressures and assist in adapting to new academic and social challenges. Parents from socioeconomically disadvantaged groups are often less educated. And families with less-educated parents differ in terms of income, job status, and

access to community resources, which in turn influence children's preparedness for school (Duncan & Magnuson, 2003; Reardon & Portilla, 2016).

Parental Education and Children's Mathematical Reasoning

Mathematical reasoning is influenced by a set of activities at home, which include shared counting, number games, board games, calendar use, and discussions about everyday problem-solving (LeFevre et al., 2009). Studies show that the frequency and quality of parental talk about numbers through labeling and counting of objects predicts children's future understanding of numbers essential for mathematical reasoning (Gunderson & Levine, 2011; Levine et al., 2010). A longitudinal study conducted in Finland showed that the mother's education level was highly correlated to both the literacy and numeracy at home for school going children. Parental struggle in mathematics was found to be the direct predictor of children's arithmetic skills and reading comprehension during their school age (Khanolainen et al., 2020). This shows two pathways of impact of parental education on children's mathematical reasoning, one is providing a rich home numeracy setting and the second one is the influence of parents' own mathematical abilities.

Influence of Parental Mathematics Anxiety on the Learning of Children

Parents' feeling and attitude toward mathematics has a significant influence on their children. Math anxiety can be learned through experiences and may also be passed from one generation to the next. (Maloney & Beilock, 2012). When parents with high levels of math anxiety frequently helped their children with mathematics homework, their children showed lower learning-gains over the school years and were more likely to develop math anxiety themselves (Maloney et al., 2015). However, direct involvement and helping of parents in math homework can often lead to more negative feelings among children than engaging and helping informally in math activities. This is especially true for parents who are less confident in their ability to help in mathematics related activities. These negative experiences are linked to lower motivation and achievement in mathematics among children in future endeavours (Wu et al., 2022; Jay et al., 2018). Less-educated parents often feel less confident about helping in mathematics activities, which may affect children indirectly while working on assignments in stressful interactions (Hoff & Laursen, 2019). In contrast, supportive and less anxious interaction with parents may help in a true sense.

Interaction Pathways of Parental Education with School Adjustment and Mathematical Reasoning

Overall, the literature points out four connected ways in which parental education may influence children's school adjustment and mathematical reasoning: resources, expectations, interactions and emotions. More educated parents often have greater socioeconomic resources to support children at home (Duncan & Magnuson, 2003; Kornrich & Furstenberg, 2013). Expectations show higher educational aspirations that encourage achievement of children (Pinquart & Ebeling, 2020). Interactions increase the number of talk and support, and lowers controlling homework practices (Gunderson & Levine, 2011; Wu et al., 2022). And emotional stability is linked with lower math anxiety and greater self-efficacy, which helps in reducing the transmission of negative attitudes toward mathematics (Maloney et al., 2015; Zhou et al., 2026). These pathways often work together and gradually shape children's school adjustment and mathematical reasoning from early childhood through primary stage.

Indian Context and NEP 2020

These findings are much relevant to India, where studies show significant gaps in children's foundational literacy and numeracy. National surveys indicate that only a little portion of children in the early primary grades are able to perform mathematical tasks at their respective grade level (Alcott & Rose, 2017; Bhattacharjea et al., 2015). This highlights the importance of parental education to support literacy and numeracy of children at home. The National Education Policy (NEP) 2020 prioritizes the foundational literacy and numeracy (FLN) and recognizes mathematics and mathematical thinking most important for India's future. It also emphasizes early childhood care and education, particularly for children from socio-economically disadvantaged communities and rural India (NEP, 2020). The evidence highlighted in this study suggests that the programmes like FLN and NIPUN Bharat could be strengthened by including greater support from parents. Simple guidance on enjoyable, low-anxiety mathematics activities and number talk at home, and ways of engaging children with numbers can boost the school-based reforms. This is important because children's mathematical development is shaped in the classroom and home equally, through the educational background and support provided by the parents may differ considerably.

Gaps in the Literature

There are several gaps in the existing research. One, most of the studies on the home numeracy environment and parental mathematics anxiety have been conducted in North America, Europe, and East Asia; with a very few longitudinal researches from South Asia and other low-income countries like India, where foundational numeracy is a major concern. Another issue is that parental education is often examined along with other socioeconomic factors, which makes it difficult to identify the independent effect from family income and occupational status. Further, the contribution of fathers receive less attention than mothers in home numeracy research since mothers are usually taken as the primary contact and source of information. Finally, many other factors like school adjustment, mathematics anxiety and mathematical reasoning together with the influence of parental education can produce an interwoven intersection of effects which needs more investigation.

Conclusion

Parental education plays an important role in shaping both children's school adjustment and mathematical reasoning. Efforts need to be made to make mathematics a part of everyday life instead of limiting it to textbooks and homework. Parents can encourage children to count household items, compare prices while shopping, measure ingredients during cooking, recognise patterns, and calculate date and time in different activities. Use of technology can make this learning more playful and engaging. Parents can make use of age-appropriate educational apps, virtual and interactive mathematical games, digital stories, and videos in helping their children to explore numbers, shapes, patterns, and simple problem-solving activities. A lot of such digital learning resources are available on DIKSHA platform which can complement classroom learning and provide opportunities for children to practise at their own pace and interest. Since most Indian parents are not tech savvy, they need to explore such technologies alongside their children to benefit from it. Digital versions of simple activities, such as estimating the cost of groceries or counting objects can nurture curiosity and logical thinking. Parents do not need expensive devices or advanced technological skills to support mathematical learning, rather they can simply spend some time with their children, encourage them, and show willingness to learn together. By combining daily life activities, meaningful

conversations, and right use of digital resources, parents can make mathematics enjoyable and build the confidence of their children for better adjustment at school.

The influence of parental education is seen beyond formal education such as in educational expectations, everyday interactions, and attitudes towards mathematics. These findings highlight the need for longitudinal studies examining school adjustment and mathematical reasoning together. Parents need to be given greater attention to support their children in strengthening foundational literacy and numeracy through the programmes like ULLAS and other adult education programmes suggested by NEP 2020. This will help them build confidence and adopt simple, engaging ways to explore mathematics at home, without creating anxiety or pressure on children and hence support their overall learning.

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