

Role of Family Climate in Enhancing Academic Achievement of Girls in Science Stream

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ABSTRACT

Family climate is an essential social and emotional environment that directly influences children's learning outcomes and academic excellence. Girls, especially in the science stream, demand more parental encouragement, open communication, and emotional stability while facing academic challenges. The primary objective of this study was to explore how a supportive family climate enhances girls' academic performance in the science stream. Findings reveal that where parents create an education-oriented and cooperative environment, girls' motivation, self-confidence, scientific curiosity, and problem-solving ability are significantly stronger. A positive family climate provides a stress-free and nurturing environment, allowing them to confidently master complex science concepts. On the other hand, conflict-ridden or neglectful family climate triggers anxiety, lack of concentration and comparatively low performance in girls. Research concludes that strong family bonding, academic encouragement, and positive communication are essential for girls' sustained achievement and excellence in science education.

Keywords: *Family Climate, Academic Achievement, Science Stream, Parental Support, Motivation, Self-Confidence.*

Introduction:

Family climate is a social and emotional environment that directly influences children's learning outcomes and personality development. Especially for girls who choose the science stream, a supportive family environment plays a crucial role in shaping their academic achievement. Science subjects demand logical reasoning, critical thinking, and complex concepts, so a positive family climate boosts motivation and concentration. Girls face many barriers in their academic journey, such as gender stereotypes, lack of confidence, and sometimes pressure from parental expectations. These barriers can be easily overcome if the home environment is cooperative, nurturing, and education-oriented. Research studies have proven that where parents provide their children with academic encouragement, open communication, and positive reinforcement, girls' academic achievement is higher (Steinberg, 2001).

A stress-free and emotionally stable family environment enhances girls' confidence, curiosity, and interest in the practical applications of science. Thus, the family climate not only uplifts academic performance but also provides a foundation for girls' holistic development and long-term success.

Importance of Science Stream for Girls in Higher Education:

The science stream is crucial for girls in higher education because it lays a strong foundation for their academic, professional, and social development. Science is a discipline that enhances critical thinking, logical reasoning, and problem-solving skills. When girls opt for the science stream at the higher education level, it opens up diverse career opportunities for them, such as medicine, engineering, research, technology, and applied sciences (UNESCO, 2019). Girls' participation in science education is also crucial for gender equality

and women's empowerment. Globally, studies have shown that where women's representation in STEM (Science, Technology, Engineering, and Mathematics) fields is high, their socioeconomic status also improves (Beede et al., 2011). In the Indian context, science education also prepares girls for employment and decision-making roles, providing them with financial independence and social recognition.

The science stream in higher education not only provides girls with knowledge but also inspires innovation and creativity. This stream allows them to develop analytical minds and actively participate in experiments and research-based learning (National Science Foundation, 2020).

However, cultural stereotypes and family expectations sometimes become barriers to girls' science education. However, if the family climate is supportive, girls confidently pursue science subjects and their academic achievement is remarkable. Therefore, the science stream in higher education is not just an academic choice, but a long-term empowerment tool for girls that shapes their personal and professional lives.

Concepts of Family Climate (Definition & Dimensions):

Family climate can be broadly defined as: the overall emotional, social, and intellectual environment within the family that shapes children's behaviour, attitudes, and academic growth (Moos & Moos, 1981). This means that every aspect of the family communication style, parental support, discipline, and bonding directly impacts a child's learning process.

Dimensions of Family Climate:

1. Emotional Support:

Emotional stability and affection create a secure base for girl students. When parents praise their achievements and provide moral support during failures, their self-confidence and intrinsic motivation are enhanced (Ryan & Deci, 2000).

2. Communication:

Open and healthy communication is a strong factor that promotes girls' curiosity and academic engagement. When education-related discussions

occur regularly at home, girls confidently explore science concepts.

3. Parental Involvement:

Parental monitoring and active participation in academic activities significantly uplifts girls' performance. Help with homework, career guidance, and supervision of study habits are all part of a positive climate (Fan & Chen, 2001).

4. Discipline:

Consistent and fair discipline rules teach children responsibility and time management. When parents adopt the role of supportive authority, girls achieve their learning goals in an organized manner.

Objectives:

1. To study how positive family climate improves girls' motivation, confidence, and achievement in science.
2. To examine the role of parental support, communication, and emotional stability in girls' academic success.
3. To analyze how positive vs. negative family climate affects girls' aspirations and performance in science education.

Theoretical Background Support:

Some important psychological and educational theories provide support for understanding the role of family climate in girls' academic achievement.

Bronfenbrenner's Ecological Systems Theory (1979) states that child development is influenced by multiple systems, with the most primary level being the microsystem—the family. The family is the direct environment that shapes girls' behaviour, learning, and motivation. A supportive and education-oriented family creates positive learning opportunities for girls.

Bandura's Social Learning Theory (1977) explains that children learn through observation and reinforcement. Girls adopt academic behaviours, motivation, and confidence by observing their parents and siblings. When parents reward or encourage their achievements, girls develop self-

confidence and a positive attitude toward learning. The family climate thus serves as a modeling ground from which girls learn interest and problem-solving approaches to science subjects.

Family Systems Theory (Bowen, 1978) :

highlights that the family is an interconnected system in which balanced interactions and healthy communication create harmony. If the home environment is conflict-free and each member supports each other, girls' stress levels decrease and academic focus improves. Elements such as discipline, parental involvement, and emotional support uplift girls' overall performance.

These theories make it clear that family climate is a fundamental factor that determines girls' academic outcomes, motivation, and long-term achievement. Theoretical frameworks prove that a supportive and cooperative family environment is essential for girls to excel in the science stream.

Family Climate and Academic Achievement:

Family climate contributes to the development of the following aspects of academic achievement:

1. Motivation & Study Habits:

Family climate directly shapes girls' motivation and study habits. When the home environment is supportive, girls become more disciplined and regular in their studies.

2. Concentration & Problem-Solving:

A positive family climate helps girls feel stress-free and concentrate better on their academics. Parental guidance also strengthens problem-solving skills.

3. Academic Confidence:

The link between family climate and academic achievement clearly shows that when parents provide trust and encouragement, girls' confidence increases and they handle even difficult subjects confidently.

4. Emotional Stability:

A healthy family climate makes girls emotionally stable. This stability helps them handle academic challenges and maintain consistent performance.

5. Communication Skills:

Open and Positive Communication is a part of the family climate, which allows girls to express their idea freely. This directly improves their academic presentation and conceptual clarity.

6. Parental Involvement:

When the family climate is education-oriented and parents are actively involved, girls' achievement levels automatically increase. Involvement creates a sense of responsibility and dedication.

7. Self-Discipline & Responsibility:

Balanced discipline rules are an important aspect of the family climate, which helps girls develop self-discipline and responsibility. These qualities are directly beneficial for their academic success.

8. Stress Management:

A supportive family climate helps girls manage stress effectively. Academic failures become a learning opportunity for them, not a barrier.

9. Career Aspirations:

A positive family climate motivates girls to pursue their future goals and higher education. Academic achievement and family encouragement together strengthen their career aspirations.

The Specific Role of Family Climate in Girls' Education:

Family climate serves as a backbone for girls' education. When the home environment is supportive, gender-sensitive, and emotionally stable, girls achieve their academic potential with full confidence. Many research findings suggest that parental behaviour and their active involvement in their children's education have a direct impact on their motivation level, their self-belief, and overall academic outcome (Steinberg, 2001; Fan & Chen, 2001).

Key roles that family climate plays in girls' education:

1. Gender Sensitivity in Family Expectations:

When families eliminate gender stereotypes in their expectations and provide girls with equal educational opportunities as boys, both their academic engagement and aspirations increase. A gender-sensitive family climate becomes a source of empowerment for them (UNESCO, 2019).

2. Parental Encouragement for Science Learning:

The science stream is demanding and challenging, so parental encouragement plays a critical role. When parents guide girls with homework, discuss career choices, and motivate them even after failures, their achievement improves significantly (Fan & Chen, 2001; Singh & Jha, 2012).

3. Breaking Stereotypes and Building Self-Confidence:

In many cultural contexts, the stereotype that science and technical subjects are more suitable for boys still persists. But a supportive family climate breaks this stereotype and builds confidence in girls that they too can excel in STEM fields (Beede et al., 2011; Eccles, 2007).

4. Emotional Stability and Resilience for Academic Challenges:

Failures and stress are common in the academic journey. When the family climate is nurturing and emotionally balanced, girls develop resilience and coping strategies. This stability allows them to remain consistent even in tough science subjects (Ryan & Deci, 2000; Dubow & Ippolito, 1994).

Parental Support and Academic Motivation:

Parental support serves as a foundation for girls' academic motivation. When parents actively guide girls, monitor their progress, and praise their achievements, girls develop greater enthusiasm and self-confidence in their studies (Fan & Chen, 2001).

Connected Roles that Parental Support Plays in Academic Motivation:

1. Academic Encouragement and Monitoring:

Regular parental encouragement and monitoring of academic progress create a structured learning environment for girls. This kind of support increases their commitment to their studies and helps them stay consistently focused on their academic goals (Gonzalez-DeHass, Willems, & Don Holbein, 2005).

2. Parent–Child Communication in the Learning Process:

Open and frequent communication facilitates the learning process. When parents discuss academic challenges, girls confidently share their doubts and

their learning efficiency improves (Hoover-Dempsey & Sandler, 1997).

3. Impact of Appreciation and Recognition:

Parental praise and recognition of achievements boost girls' self-confidence. This positive reinforcement boosts their intrinsic motivation and leads them to actively perform in science subjects (Ryan & Deci, 2000).

4. Role Models in Family (Influencing Career Aspirations in Science):

If family members serve as role models in academic or professional fields, girls are inspired and align their career aspirations with science and STEM. This parental influence sustains their long-term academic motivation (Eccles, 2007).

5. Creating a Learning-Oriented Home Environment:

When the home atmosphere is study-friendly—such as exposure to books, internet resources, and academic discussions—girls' motivation automatically increases (Epstein, 2001).

6. Providing Resources and Opportunities:

If parents provide access to study materials, coaching, and science-related activities (such as exhibitions, lab visits), girls' learning interest and curiosity are piqued (UNESCO, 2019).

7. Setting Realistic Expectations:

When parents keep their expectations realistic and supportive, unnecessary pressure on girls is reduced. This balance sustains motivation and promotes stress-free achievement (Wentzel, 1998).

8. Emotional Support during Academic Pressure:

Science streams are demanding, and exam pressure is common. When parents provide emotional support and understand and encourage girls during failures rather than blaming them, girls become more resilient and pursue their academic goals with more determination (Dubow & Ippolito, 1994).

Barriers of Negative Family Climate:

A positive family climate enhances girls' academic growth, but when the home environment becomes negative, it has a direct impact on their studies. Barriers such as conflict, neglect,

overpressure, and gender bias undermine their confidence and performance (Steinberg, 2001).

Key Barriers:

1. Conflict-Ridden Families '1 Anxiety, Stress, Low Performance:

When there are constant conflicts and fights at home, girl students feel anxiety and stress. This causes them to lose focus on their studies and their performance to decline (Cummings & Davies, 2010).

2. Neglectful/Authoritarian Parenting '1 Lack of Motivation:

If parents are neglectful or only follow an authoritarian style, girls lack parental support and guidance. This situation reduces their motivation and academic interest (Baumrind, 1991).

3. Overpressure and Comparison Fear of Failure:

When parents have unrealistic expectations or make frequent comparisons, girls develop a fear of failure. This fear blocks creativity and problem-solving abilities (Turner & Patrick, 2004).

4. Gender Bias in Family Expectations:

Many families have stereotypes and restricted roles for girls, making them less likely to pursue science. This gender bias directly affects their self-confidence and academic aspirations (UNESCO, 2019).

Strategies for Enhancing Positive Family Climate:

A positive family climate is essential for girls' academic achievement. When parents provide a supportive, cooperative, and education-oriented environment, girls' motivation, self-confidence, and learning efficiency significantly improve.

Key Strategies:

1. Open Communication Channels:

Open and respectful communication at home allows girls to freely discuss their problems and doubts. This directly supports their learning process and problem-solving skills (Hoover-Dempsey, 1997).

2. Academic Guidance and Cooperative Learning Environment:

Parents' provision of homework and project guidance and encouragement of cooperative learning enhance girls' academic interest and performance. This increases confidence in science and research-based subjects (Fan & Chen, 2001).

3. Balancing Discipline with Emotional Support:

Providing emotional support along with strict discipline teaches girls responsibility and helps them manage stress. The right combination of this kind of emotional support and discipline is considered essential for girls' consistent good performance and mental strength (Ryan & Deci, 2000).

4. Creating an Education-Friendly Home Environment:

Providing a study-friendly home setup, such as time, space, and resources, improves girls' concentration and self-directed learning. This environment lays the foundation for their long-term academic success (Epstein, 2001; UNESCO, 2019).

Conclusion:

A positive family climate directly enhances girls' academic achievement, especially in the science stream. A supportive and nurturing environment develops their motivation, self-confidence, concentration, problem-solving skills, and resilience, enabling them to effectively handle challenging subjects. Essential factors such as strong family bonding, consistent encouragement, emotional stability, open communication, and balanced discipline play a foundational role in girls' learning outcomes. Negative family climates, such as conflict, neglect, overpressure, and gender bias, hinder their academic performance and career aspirations, so family awareness and guidance programs are crucial. The implications for policymakers, teachers, and parents are to design family-oriented interventions and supportive frameworks that enable girls to excel with equal opportunities in STEM and science fields. Ultimately, a positive family climate is a key factor in girls sustained academic success and holistic development.

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