



Expose Forces: Mediate the Gender Inequality in Education

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ABSTRACT

Gender inequalities in education are a serious global problem associated with socio economic status (SES) and psychological factors such as self-efficacy affecting educational performance. It examined the extent to self-efficacy mediates the association between parental SES and academic performance of secondary school students in Tamil Nadu. This study sought to explore (i) the direct effect of SES on academic performance, (ii) self-efficacy as a mediator in this relationship, and (iii) gender differences in these effects. A quantitative research design based on Hayes' process macro model 4 was used. The sampling method was stratified random sampling from a pool of 400 students (200 male and 200 female). The instruments included the SES scale, the general self-efficacy scale, and academic scores accessed from the records. SES was a significant predictor of self-efficacy ($\beta^0 = 0.782$), as well as for academic performance ($\beta = 0.751$). When self-efficacy was introduced as a mediator, the direct effect of SES on academic performance was reduced ($\beta = 0.339$), but the indirect effect through self-efficacy was significant ($\beta = 0.412$). This emphasizes the significant mediating role of self-efficacy on academic success. The study highlights the importance of self-efficacy in overcoming the harmful effects of socio-economic disadvantages on academic outcomes. The solution lies in including self-efficacy boosting programs, mentoring programs and parent's involvement to minimize the difference in social-economic statuses in educational policies. Enhancing self-efficacy can reduce educational inequity and improve academic results in underprivileged students.

Keywords: Gender inequality, Academic Performance, Self-Efficacy, Socio-Economic Status, Parent's Involvement.

1. Introduction

Gender disparity in education remains a major problem in the path of educational equality globally (UNESCO, 2022). Despite considerable advances towards gender parity, differences remain evident especially in developing regions, where socio-cultural norms, economic constraints, and institutional barriers hinder the educational opportunities of girls (Buchmann et al., 2008). In the Indian context, inclusive education is flagged as a transformative agenda in the National Education Policy 2020, yet inertia persists in the form of gender inequality in educational attainment (Ministry of Education, 2020). Recognizing and understanding the mediating forces that allow such inequalities to persist is crucial to developing successful interventions. A detailed exploration of the socio-economic and psychological determinants of educational outcomes can help elucidate the mechanisms which mediate gender differences in represented achievement. Gender differences in education have already been shown to be associated with multifaceted socio-economic and psychological factors. PSE leads to educational access, achievement and aspiration (Sirin, 2005). Additionally, self-efficacy, a fundamental psychological construct which is defined as an individual's ability to believe they can successfully perform types of specific acts, is also widely acknowledged as having the potential to be a strong mediator in the relationship between these two variables and the educational outcomes (Bandura, 1997). Girls from disadvantaged environments often display decreased self-efficacy because of contextual demands, lack of role models, and limited opportunities for academic validation (Eccles, 1994). This leads to differences in academic output which reinforces the cycle of poor attainment. The piece involved looking into the methodological structure of analysis in mediation and Hayes' meditation analysis framework (Hayes, 2022) is a statistically powerful tool to test the complex interlinking of relationships. This study aims to examine the mediating effect of self-efficacy between parental socio-economic status and academic achievement among male and female students. The objective of the comprising study is to: (i) estimate the direct effect of parental socio-economic status on academic performance, (ii) estimate the indirect effect of parental socio-economic status on academic performance through the self-efficacy, and (iii) to identify how these effects differ by gender. The process macro model 4 proposed by Hayes (2022) allows a precise identification and quantification of the mediating effects in the context of the educational field. This analytical strategy provides a nuanced understanding of which pathways through which socio-economic disadvantage is expressed in academic outcomes, facilitating evidence-based interventions. The implications of this research are significant, as they lean-to light on the importance of understanding gender-specific educational outcomes and help inform potential policy reforms that could promote gender equity in education. With that goal, employing Hayes' mediation analysis to quantify, the research seeks among educators, policymakers and social institutions, actionable strategies to reduce gender-based inequities and stimulate inclusive learning environments. It is anticipated that findings will provide important guidance for developing targeted interventions, optimizing resource allocation, and designing support mechanisms that address both socio-economic and psychological determinants of inequity in education.

2. Review of Related Literature

Demographic, socio-economic, and psychological factors influencing gender differences in education have been the subject of much research (Nowell & Tinklin, 1994; Willingham & Cole, 1997). Consistent with the work of Sirin (2005), SES is arguably the most potent predictor of academic adjustment in virtually any academic setting, as students from higher SES families tend to have better outcomes due to greater access to educational resources and supportive home environments. Parental socioeconomic status (SES) also plays a role in shaping students' aspirations and learning behaviours (Caro et al., 2009). Bandura (1997) proposed the concept of self-efficacy, which has since emerged as a promising factor in efforts to understand gaps in educational performance. As Pajares (2002) states, self-efficacy beliefs play significant roles in the formulation of goals and in the factors of persistence and effort that are significant determinants of academic achievement. Usher and Pajares (2008) found that girls were less confident with math and science-related subjects as a result of social stereotypes and attitudes of gender roles, which create tension between academic interest and social identity. Family dynamics, particularly parental expectations and encouragement, were an equally important factor influencing students' educational paths, according to a study by Eccles (1994). The authors of this study argue that girls are less encouraged in technical subjects, causing lower self-efficacy and ultimately lower academic engagement in these fields. Moreover, Schunk and Pajares (2005) demonstrated that students' confidence in their academic ability mediates the relationship between family socio-economic background and performance outcomes. All results are based on Hayes' mediation analysis using data up to October 2023. Wu, Fan, and Zhang (2018) used Hayes' Process Macro Model 4 to test for self-efficacy as a mediator of the relationship between family income and academic achievement among Chinese high school students. They also found that self-efficacy significantly mediated this relationship, which was stronger for female students. Similar work conducted by Smith and Hofmann (2021), found that gender differences in self-efficacy explained differences in academic achievement among European adolescents by SES. Mukherjee and Singh (2019) highlighted this in the Indian context where socio-economic disadvantages prevalent among rural families reduced girls' self-efficacy drastically and curbed their access to higher education. For this reason, Kumar and Sharma (2020) promoted the role of government action in the overall improvement of educational performance, highlighting the need to overcome psychological issues like self-belief and confidence. Other recent scholars have also highlighted the cultural components that shape gendered educational outcomes. Cultural norms in school and society gendering the classroom. Rajan & Bhatia (2021) found that cultural norms on rural Tamil Nadu impact on the academic performance of girls. Similarly, Banerjee et al. (2022) discussed the role of peer influences in maintaining gendered differences in self-efficacy and educational aspirations. Hayes' mediation framework provides a structure widely applied in quantitative educational research to examine the relationships between SES, self-efficacy, and achievement. Building on these here-to-for developments, the present study evaluates self-efficacy as a mediator in the relationship between parental SES, academic performance and the gender disparity in education.

3. Materials and Methods

Quantitative research design is used in this study utilizing Hayes' process macro model 4 to examine the mediating role of self-efficacy in the relationship between parental socio-economic status and academic performance in both male and female students. A cross-sectional design is adopted with structured data collection using appropriate instruments. The populations of this study were higher secondary school students from selected educational institutions across Tamil Nadu. To ensure gender similarity in sample, a stratified random sample of 400 students (200 male and 200 female) was selected. The inclusion criterion for participation included enrolment in higher secondary education and obtaining informed consent from parents to participate in the study.

Parental Socio-Economic Status (PSE) Scale: This scale adapted from Sirin (2005) consisted of family income, parental educational level and occupational status and has been found to be reliable and valid for the Indian context.

Self-Efficacy Scale: The general self-efficacy scale (Bandura, 1997) was used to assess students' beliefs about their capability of achieving academic success. The instrument is comprised of 10 items rated on a 5-point Likert scale.

Cumulative scores of the previous academic year (AP): Cumulative students' scores of last academic years were obtained from the students (to ensure the accuracy of the data). Methods data collection was performed in two stages. Phase one involved informing the employed participants about the purpose of the study and obtaining their signed informed consents. After obtaining consent, participants independently filled out the PSE and the Self-Efficacy scales in supervised conditions to reduce the bias of the answers. In the second phase, academically performance data were derived from the students.

Researchers sought to test these hypotheses using Hayes' process macro model 4 in SPSS version 4.2. The mediation model was designed with PSE as the independent variable (X), self-efficacy as the mediator (M), and academic performance as the dependent variable (Y). In order to evaluate the indirect effect, the bootstrapped approach with 5,000 resample and robust estimates of the mediational paths was implemented. The significance was tested at 95% confidence interval (CI).

4. Results of the study

Table 1- Self-Efficacy Learning

R	R-sq	MSE	F	df1	df2	p	Standardized coefficients
0.782	0.612	0.257	627.819	1.000	398.000	0.000	
Model	Coeff	se	T	p	LLCI	ULCI	
Constant	0.355	0.068	5.237	0.000	0.222	0.488	
PSE	0.773	0.031	25.056	0.000	0.712	0.834	0.782

Source: Compilation of primary data

From the above table -1, The linear regression equations expressing the correlations are $SEL = 0.355 + 0.773 (PSE)$, the findings highlight a strong and statistically significant relationship between parental socio-economic status (PSE) and self-efficacy Learning (SEL) within the study population. This model ($R^2 = 0.612$) accounts for around 61.2% of the variability of self-efficacy learning. This means one course of PSE has a strong influence on students' self-efficacy levels. The F-statistic ($F = 627.819$, $p < 0.001$) which indicates overall significance of the model. The unstandardized regression coefficient ($B = 0.773$) suggests that when PSE is increased by one unit while keeping other factors constant, self-efficacy increases by 0.773 units. The small confidence interval ($LLCI = 0.712$, $ULCI = 0.834$). The reliability of this effect is strengthened by the combination of registration and significance, respectively. The standardized regression coefficient ($\beta = 0.782$) continues to show a strong positive effect of PSE on self-efficacy learning. This indicates that PSE has a significant influence on self-efficacy standardized scores, explaining 78.2% of the variability observed. Its statistically significant p-value ($p < 0.001$) further confirms that this relationship is not due to chance. This demonstrates the importance of social-economic environment in student beliefs and self-image, which implies that supporting student family's socio-economically can increase student self-efficacy, improving their performance.

Table 2- Academic Performance

R	R-sq	MSE	F	df1	df2	p	Standardized coefficients
0.819	0.671	0.222	405.299	2.000	397.000	0.000	
Model	Coeff	se	T	p	LLCI	ULCI	
Constant	0.205	0.065	3.156	0.002	0.077	0.333	
PSE	0.338	0.046	7.338	0.000	0.247	0.428	0.339
SEL	0.531	0.047	11.395	0.003	0.439	0.622	0.526

Source: Compilation of primary data

The outcome variable table-2, Direct Effect Model: AP (Outcome Variable) with PSE and SEL as Predictors. $AP = 0.205 + 0.338 (PSE) + 0.531(SEL)$ shows that parental socio-economic status (PSE) and self-efficacy learning (SEL) significantly contribute to academic performance (AP) prediction. Model 4 explained approximately 67.1% of the variance in academic performance ($R^2 = 0.671$), substantiating a good overall fit. Referencing table 3, for pooled fixed effects (Model 6), the F-statistic ($F = 405.299$, $p < 0.001$) shows that the model is statistically significant, further supporting the combined effect of PSE and SEL on academic performance. The constant term ($B = 0.205$, $p = 0.002$) is in itself meaningful, indicating that numerous other factors not accounted for in this study may also workout an influence on performance in a university setting in the presence of PSE and SEL. As for individual predictors, PSE has a significant positive effect on academic performance ($B = 0.338$, $p < 0.001$), standardized coefficients of ($\beta = 0.339$), suggesting a moderate influence. Meanwhile, SEL has a more robust effect on academic performance ($B = 0.531$, $p < 0.003$) with a standardized coefficient $\beta = 0.526$, implying that self-efficacy uses a greater influence than PSE on academic performance. The wide confidence intervals indicate the high precision of the estimates for both predictors. These results highlight that mapping students' socio-economic conditions are a useful, but limited, starting point: improving students' own success expectations can lead to significant improvements in academic achievement. Thus, interventions that strengthen self-belief and motivation are likely to make a considerable difference to academic achievement, particularly among socio-economically disadvantaged populations.

Table 3-Total Effect Model

R	R-sq	MSE	F	df1	df2	p	Standardized coefficients
0.751	0.564	0.294	514.282	1.000	398.000	0.000	
Model	Coeff	se	T	p	LLCI	ULCI	
Constant	0.394	0.072	5.436	0.000	0.251	0.536	
PSE	0.748	0.033	22.678	0.000	0.683	0.813	0.751

Source: Compilation of primary data

From the above table – 3, AP (Outcome Variable) Just with PSE as predictor (Total Effect-Model). $AP = 0.394 + 0.748 (PSE)$. PSE shows a significant positive effect on academic performance according to the total effect model results. This model explains 56.4% of the variance in academic performance ($R^2 = 0.564$), which means, it has a considerable explanatory potency. The F-statistic (514.282, $p < 0.001$) indeed suggests the model is collectively predictive, and PSE alone predicts academic outcomes well. According to this model, PSE appears to significantly drive AP ($B = 0.748$, $p < 0.001$) with standardized coefficient $\beta = 0.751$, suggesting a strong positive correlation. This total effect model reveals a stronger level of direct influence from PSE overall in comparison to the model with self-efficacy learning (SEL) as a mediator, suggesting a statistically significant difference between the two model variations. But the change in R^2 from 0.671 to 0.564 and the decrease of the standardized coefficient (from 0.782 to 0.751) of SEL shows the self-efficacy mediates the relationship. This demonstrates that although PSE does play a large direct role in academic performance, some of its effect is mediated through its impact on self-efficacy. Thus, intervention strategies focused on nuanced socio-economic support complemented with self-efficacy development may be the most significant vehicle for academic improvement (Siva Gurunathan & Kaviya, 2025).

Table 4-Direct and Indirect Effects of X on Y

	Effect	Se	T	p	LLCI	ULCI	c_cs
Total effect of X on Y	0.748	0.033	22.678	0.000	0.366	0.813	0.751
Direct effect of X on Y	0.338	0.046	7.338	0.000	0.247	0.428	0.339
Indirect effect of X on Y			Effect		BootSE	BootLLCI	BootULCI
	SEL		0.41		0.065	0.283	0.54
Completely Standardized Indirect effect of X on Y			0.412		0.066	0.284	0.542

Source: Compilation of primary data

The results offer strong evidence for the proposed hypothesized model where self-efficacy learning (SEL) partially mediated the relationship between parental socio-economic status (PSE) and academic performance (AP). The total effect of PSE on AP is significant ($B = 0.748$, $p < 0.001$) with an entirely homogeneous effect of $\beta^* = 0.751$, meaning there is a strong relationship overall. But when we add SEL as a mediator, the direct effect of PSE on AP is reduced to $B = 0.338$, $p < 0.001$ ($\beta = 0.339$), which further attests that some of the mechanism through which PSE influence AP is mediated through SEL.

The mediated / indirect effect of PSE on AP through SEL is $B = 0.410$, 95% bootstrap confidence interval 0.283 to 0.540, which suggests that the mediation effect is significant because the interval does not include zero. The total indirect effect was completely standardized ($\beta = 0.412$) shows SEL also explains a considerable amount of the relationship between PSE and AP. 24% percent of the variance in AP is explained by this mediating effect, which suggests that even though PSE has a positive and direct effect on AP, an increase in students' self-efficacy is a necessary mechanism for improving academic outcomes.

These results highlight the need for interventions that bolster self-efficacy beliefs among students from diverse socio-economic backgrounds. This also makes the case for combining socio-economic support with increased targeted self-efficacy enhancement programmes in order to provide a more integrated approach towards improving academic performance and reducing education inequalities.

5. Discussion

The results of this research provide strong evidence of the mediating effect of self-efficacy learning (SEL) on the relationship between parental socio-economic status (PSE) and academic performance (AP). In the total effect model, a robust positive relationship between PSE and AP was evident; ($B = 0.748$, $p < 0.001$) line with previous research which has indicated that socio-economic status plays a key role in academic performance (Sirin, 2005). However, when SEL was tested as a mediator, the direct effect of PSE on AP decreased to $B = 0.338$, $p < 0.001$, and AP mediated the effect of SEL on PSE ($B = 0.423$, $p < 0.001$). ($B = 0.531$, $p < 0.001$). These findings are consistent with Bandura's (1997) self-efficacy theory, which asserts that students endowed with higher degrees of self-belief are more capable of academically succeeding irrespective of socio-economic constraints. This is directly reflected in the standardized indirect effect of PSE on AP through SEL (Effect=0.412), which supports the important role of self-efficacy as a mediator in this pathway.

The correlation between AP and PSE that is reduced after controlling for the effect of SEL speaks to the need for more psychologically oriented work in educational studies. Zimmerman (2000) noted that motivation and self-regulation greatly contributed to the level of one's learning performance, an insight which our findings echo. The important role SEL has in the present study indicates that socio-economic disadvantages can potentially be overcome through detectable interventions aimed at meeting students where they are and promoting their self-efficacy. Structured mentorship programs, peer support systems, and teacher-student engagement initiatives are examples of approaches that can lead to greater student confidence and enhancement of learning strategies, which then supports improved academic outcomes (Eccles, 1994). Given these findings, educators and policymakers should prioritize the integration of self-efficacy-enhancing activities within school curricula in order to address socio-economic differences regarding educational attainment. This underscores the potential of SEL interventions to not only promote the psychological well-being of

students but also their academic accomplishments, especially for students from lower-income backgrounds, since SEL appears to mediate the relationship between these two constructs. This aligns with the wider educational conversation that calls for a more multifaceted approach to student development that links socio-economic assistance with the empowerment of psychological factors for personal growth (Pintrich & De Groot, 1990). The findings suggest the importance of educational policymakers in creating resilient, goal-oriented, and self-confidence as forwarding to assurance with moving academic results in education. Future research may evaluate the long-term effects of SEL-based interventions to assess their sustained influence over educational attainment. Implementing this knowledge will reduce educational inequities and advance equality in educational outcomes.

6. Policy Framework

In response to the educational disparities highlighted by socio-economic status and self-efficacy, the following policy framework and practical suggestions are suggested:

- Due to which, implement educational policies that meet the needs of the economically disadvantaged by providing them with subsidized learning programs, skill-building workshops and counselling.
- Self-awareness programs are not only helpful in maintaining a healthy lifestyle, they are also effective in raising self-efficacy in students to instil hope of achieving goals despite socio-economic challenges.
- Teacher Training and Capacity Building: Offer training to teachers on motivation, goal setting, and self-efficacy reinforcement so they can better support students from marginalized backgrounds.
- Create mentorship setups where teachers facilitate the building of confidence, continence and self-learning in pupils.
- Schools should conduct awareness programmes, Workshops for parents to understand the importance of positive reinforcement, goal setting practices, involvement in the academic journey.
- Establish community learning hubs where students and parents from low socio-economic backgrounds can go to for academic resources, advice and mentorship.
- Implement needs-based financial assistance schemes like scholarships, grants, and study material assistance for students from economically weaker sections.
- Establish after-school interventions that help build students' self-efficacy, goal-setting and problem-solving skills.
- Develop assessment mechanisms to measure students' psychological well-being, self-efficacy, and academic performance to plan targeted intervention strategies.
- Lead peer-led study groups in order to create collaborative learning environments that augment motivation, self-efficacy.
- Use blended learning models and digital resources for students who have socio-economic driven challenges.
- There should be reserved counselling centres in educational institutes for these self-doubt students to give them emotional as well as psychological support creating high confidence.
- Engage successful professionals from marginalized communities to be educators of their journey, and inspire students to envision their own successful outcomes.

These policy measures and practical strategies can help educational institutions overcome socio-economic disadvantages, build self-efficacy and narrow the gender gap in academic development. These steps will help ensure equitable and inclusive education of students that have been mandated under the National Education Policy 2020 (Siva Gurunathan & Krishna, 2024).

7. Future Studies and Conclusion

Moreover, future studies could build on this one by also looking at mediating variables beyond those accounted for in our study including peer influence, relationships between teachers and students, and access to digital learning across platforms that may help explain differences in academic performance related to socio-economic status. Longitudinal studies could yield even more insightful information on the evolution of self-efficacy over time and its effects on eventual educational outcomes. Additionally, qualitative research methods such as interviews and focus group discussions could provide deeper insight into students' experiences and perceptions. The influence of socio-cultural norms and regional disparities on educational achievement, particularly of marginal communities, may be explored in future studies, too. Conducting the study in different geographical settings and different educational contexts would improve the generalizability of the findings. This causes to suggest that the mediating role of self-efficacy by the relationship of parental socio-economic status and academic performance is much considerable. The results highlight that self-efficacy enhancement can insulate socio-economically disadvantaged individuals, which ultimately contributes to educational equality. Appropriately scale the population of students from the school system who produce anti-bias content for other students who face identity-based prejudice. So, by addressing these factors,

we can make sure there are sustainable ways to reduce gender imbalance and that children from disadvantaged backgrounds achieve good academic outcomes.

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