

Exploring the Role of Gender on Problem-Solving Ability in Relation to Self-Efficacy among School-going Adolescents

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ABSTRACT

This study explores the relationship between problem-solving ability and self-efficacy, considering the role of gender among school-going adolescents in Paschim Medinipur and Purba Medinipur districts of West Bengal, India. A sample of 600 students aged 14 to 17 was selected to examine differences in problem-solving ability and self-efficacy between boys and girls. Standardized scales were used to measure both variables. Results show no significant gender difference in problem-solving ability, with boys and girls performing similarly. However, girls exhibited significantly higher self-efficacy compared to boys, particularly those from Paschim Medinipur. While self-efficacy had no significant influence on problem-solving ability among boys, it demonstrated a moderate positive effect among girls. This suggests that self-efficacy plays a more crucial role in enhancing problem-solving ability in girls. These findings highlight the need for gender-sensitive educational strategies, particularly focusing on improving self-efficacy in boys and further supporting the relationship between self-efficacy and problem-solving ability in girls. Addressing these differences can lead to better academic and personal development outcomes for adolescents.

Keywords: *Problem-solving Ability, Self-efficacy, Gender, School-going Adolescents*

Education is the primary and most significant instrument for cognitive transformation. Education serves as the paramount instrument for cognitive transformation, stimulating mental faculties and facilitating knowledge acquisition among students (Anderson, 2009). Education stimulates cognitive capacity and facilitates the acquisition of knowledge and its associated outcomes for students. Every nation possesses a distinct educational framework, and India is not exempt from it. In the Indian education system, adolescence is a crucial period for the students. Within the educational context, adolescence presents both challenges and opportunities for students. In the distinctive context of India's educational framework, adolescence emerges as a pivotal period characterized by profound changes in physical, cognitive, emotional, and social domains (Steinberg, 2017; WHO, 1999). This transitional phase, spanning roughly from 10 to 19 years, shapes individual identities and values, drawing insights from developmental psychology, neurology, and sociology to comprehend the intricate interplay of biological, psychological, and social factors influencing adolescent behavior and well-being. It is a phase where individuals

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undergo significant cognitive development, enhancing their capacity for logical thinking, problem-solving, and abstract reasoning (Piaget, 1972). This developmental stage is accompanied by profound self-reflection and exploration of one's identity, values, and goals (Erikson, 1968). Moreover, adolescents navigate complex social dynamics and peer relationships, which further contribute to their growth and development (Steinberg, 2014). The failure to effectively address challenges encountered during this formative period may precipitate mental and physical strain, thereby underscoring the critical need for proficient problem-solving skills. During adolescence, individuals experience significant progress in their cognitive development, enhancing their capacity for logical thinking, problem-solving, and abstract thinking. This stage is marked by profound self-reflection and examination of one's values, beliefs, and objectives. Therefore, individuals should possess the expertise to effectively resolve various challenges encountered in their everyday lives. D'Zurilla (1988) defined issue solving as a cognitive-emotional-behavioral process that involves employing appropriate strategies to deal with the challenges encountered in everyday life and to identify and investigate individual or collective endeavours.

Cognition is a general term used to denote thinking and many other aspects of our higher mental process i.e. reasoning, decision making, language, creativity, problem-solving ability, etc. To cope with this ever-changing and competitive world, cognitive abilities like problem-solving ability are considered a most needed ability and life skill. Cognitive abilities, notably problem-solving skills, undergo significant evolution during adolescence, becoming indispensable for navigating life's complexities (Mayer, 1983). Cognitive abilities, such as memory or problem-solving skills, undergo a vast evolution during adolescence (Hanne Op de Beeck, 2014). Problem-solving, acknowledged as a multifaceted life skill, encompasses various processes including analysis, reasoning, prediction, and evaluation. It represents an individualistic endeavor that necessitates advanced cognitive abilities to navigate from existing situations to desired outcomes (Heppner & Petersen, 1982). Central to this process is the concept of self-efficacy, which is deeply rooted in individuals' beliefs in their capabilities and significantly influences problem-solving proficiency alongside factors such as cultural backgrounds and learning preferences.

Research results revealed that problem-solving ability is associated with other abilities of human beings and remains a major determinant of the success of humans. Further, the problem-solving ability of children is affected by different factors. Innes and Thomas (1989); and Atilgan Erozkhan (2013) stated that students who have no problem-solving behaviors show avoidance and have a low level of social self-efficacy. Self-efficacy is one of the most important factors and correlates. Self-efficacy is our belief in our ability to succeed in certain situations. In Social cognitive theory, self-efficacy refers to one's knowledge of his ability to accomplish specific tasks without the need to compare it with the ability of others. Hence, it plays a vital role in understanding a problem and solving it.

Problem-solving ability is also influenced by culture, ethnicity, gender, socioeconomic status, personality, knowledge, education, academic achievement, creativity, training, intelligence, study habits, self-efficacy, learning style, etc., and many others. However, research revealed that self-efficacy is one of the major influencing factors on the problem-solving ability of students. Self-efficacy focuses on the decision of what is believed and should be done, it is considered as a factor of problem-solving. According to Geifman and Raban (2015), various studies demonstrated that individuals who exhibit higher degrees of self-efficacy perform better at problem-solving (Bandura and Wood, 1989; Bouffard-

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Bouchard, 1990; Pajares and Kranzler, 1995). Problem-solving ability is considered the heart of learning because it emphasizes developing learning of the subject, students' further learning, learning methods, and success of a certain solution. Learning different factors that affect the process and taking them into account when forming a solution gives teams the best chance of solving the problem effectively. Many attributes of students affect the problem-solving process. Study habits and self-efficacy are also influencing factors. Pimta et al. (2009) revealed that the effectiveness of students' problem-solving skills depends on factors like students' own background knowledge and skills, attitude toward the subject, school, and learning processes, interest, motivation, self-efficacy, self-esteem and teaching quality factors namely, instruction acknowledgment, participation in class activities, teacher's sanction system and giving feedbacks.

According to Wheatley (1984:1), "Something is a problem when one doesn't initially know how to do it, and problem-solving is what you do when you don't know what to do". Problem-solving skills, however, are shaped following the beliefs and expectations about one's problem-solving skills (Heppner, Witty, and Dixon, 2004). Self-efficacy belief influences life choices, motivation levels, function quality, resistance to difficulties, and vulnerability to stress and depression (Bandura, 1994). Self-efficacy is the most unique human capability, through this form of self-referent thought people evaluate and alter their thinking and behavior. These self-evaluations include perceptions of self-efficacy and beliefs in one's capabilities to organize and execute the courses of action required to manage conflicting situations. Perceived self-efficacy is a significant determinant of performance. Self-efficacious individuals consider themselves capable of performing any particular activity. Self-efficacy perceptions are nothing but judgment regarding one's capability to successfully perform specific tasks and behaviors. It involves a generative capability in which one must organize cognitive, social, and behavioral skills into integrated courses of action. Self-efficacy refers to the confidence people have in their abilities that they will be successful at a given task. Individuals who possess a high degree of self-efficacy are more likely to attempt challenging tasks, persist longer at them, and put more effort into the process. If highly efficacious individuals fail, they attribute the outcome to a lack of effort or an adverse environment. When they succeed, they credit their achievement to their abilities. Self-efficacy is the people's belief about their capabilities to produce designated levels of performance that exercise influences over events that affect their lives. Self-efficacy plays a crucial role in problem-solving (Aurah, Cassady, & McConnell, 2014). It is stated that students with high self-efficacy use problem-solving strategies more efficiently and put more effort into solving a problem (Pajares, 2005), Self-efficacy ultimately determines how an individual behaves, thinks, and becomes motivated to be involved with particular roles. It also reflects a student's judgment of capability to accomplish a specific task.

The concept of self-efficacy was first proposed by Albert Bandura in 1977. Bandura described it as the determinant, the belief of how people think, behave, feel, and effort to provide a unified theory of behavioral change. Self-efficacy is the thinking process involved in the acquisition, one's capabilities to organize, use the information, and execute the courses of action required to manage prospective situations. It is a person's belief in his or her ability to succeed in a particular situation and its important effects on the amount of effort that applies to a given task to achieve a goal or complete a task depending on whether we think we can do it. It is the ability to control your behavior, emotions, and motivations essentially. It refers to individuals' overall belief in the ability to succeed and it is related to our sense of

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self-worth or value as a human being. Hence, it is a belief in an individual's ability to solve a problem.

In addition to self-efficacy, other factors such as cultural background, gender, socioeconomic status, and educational experiences can also influence adolescents' problem-solving skills (Aurah, Cassady, & McConnell, 2014). For example, research has shown that adolescents from culturally diverse backgrounds may approach problem-solving tasks differently depending on their cultural values and beliefs. Similarly, gender stereotypes and societal expectations may influence adolescents' perceptions of their problem-solving abilities and their willingness to engage in problem-solving tasks. Moreover, problem-solving proficiency is influenced by a myriad of factors, including cultural backgrounds, learning preferences, and self-efficacy (Geifman and Raban, 2015). Originating from Albert Bandura's seminal work in 1977, self-efficacy underscores individuals' beliefs in their capacity to achieve specific goals, thereby shaping their behavioral, emotional, and motivational responses. Consequently, self-efficacy plays a pivotal role in problem-solving, reflecting individuals' assessments of their capabilities and their readiness to engage with and overcome tasks effectively.

Rationale of the study

Ince (2018) maintained that students' physics problem-solving abilities have affected the levels of metacognition, achievement, attitudes, motivation, self-efficacy, and self-confidence. Self-efficacy and problem-solving skills have a significant and positive relationship with job performance (Abosedo and Adesanya, 2017). It is reported that interpersonal problem-solving skills are important predictors of social self-efficacy (Erozkan, 2013). A study by Samsari and Soulis (2019) revealed that positive correlations were found among problem-solving self-efficacy, resilience self-efficacy, and subjective well-being. Erozkan (2013) observed a significant correlation between communication skills and interpersonal problem-solving skills, social self-efficacy, and communication skills. In another study, Erözkan (2014) revealed that a positive relationship was found among social self-efficacy, constructive problem-solving, and insistent-persistent approach. Results also revealed that a positive and moderate relationship was found among the levels of computational thinking, programming self-efficacy, and reflective thinking aimed at problem-solving (Durak et al., 2019). Ancel, (2016) revealed significant difference exists between the Problem-Solving Inventory (PSI) and Self-efficacy Scale scores and sub-dimensions of PSI determined that students receiving training perceived themselves as more competent in the Reflective Approach, the Evaluative Quick Approach, and the Planned Approach but there was no difference in the Quick Approach, Abstention Approach, and Self-Reliable Approach. Butler (2013) maintained that children performed better on symbolic problems than on any of the three-word problem types and the lower-income group performed better on innovative social-cognitive word problems than on decontextualized word problems but word problem variations did not have an effect on the higher-income group. Bİlge et al. (2014) observed that students with adequate study skills and high self-efficacy beliefs also had high school engagement levels.

Bala and Shaafiu (2016) also found no significant difference between male and female students in problem-solving ability. Armagan et al. (2009) while studying the effect of problem-solving skills on achievements of female and male students found a situation in favour of female students. Whereas, Gupta (2013) maintained that Sex and Caste problem-solving impacts the problem-solving ability of students. Agnihotri (2015) showed that the

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students of Science and Commerce have a higher level of problem-solving ability as compared to the students of the Arts stream.

Cheema and Kitsantas (2014) showed that improvement in disciplinary climate was associated with a reduction in the achievement gap whereas improvement in self-efficacy was associated with an expansion in that gap and these effects varied across race and gender and a significant interaction effect was found between the disciplinary climate and self-efficacy. AnupamLata, (2019) observed students (male and female) coming from different residential backgrounds perceived their self-efficacy differently. Meera & Jumana (2015) observed a significant difference in the self-efficacy of rural and urban students but did not find any gender difference. Adelodun and Asiru (2015) revealed that academic self-efficacy had a positive relationship with performance in English discourse writing while gender had no significant correlation with the dependent variable. Tenaw (2013) revealed that no significant difference in their self-efficacy between the sexes. Sachitra and Bandara (2017) found that undergraduates lacked the confidence to ask and answer questions, seek help from lecturers, have a study plan, and engage in academic discussion and note-taking and results also showed significant differences in academic self-efficacy concerning academic years. Abusalehi et al. (2019) observed a statistically significant relationship between age with academic self-efficacy, no significant statistical relationship between self-efficacy and location, and a significant correlation between college degrees and academic self-efficacy. Chemers et al. (2001) found that academic self-efficacy and optimism were strongly related to performance and adjustment, both directly on academic performance and indirectly through expectations and coping perceptions on classroom performance, stress, health, and overall satisfaction and commitment to remain in school. The study result showed that there was a relationship between students' academic self-efficacy and academic motivation at the Students University of Payamnoor and problem-solving had the most ability for academic self-efficacy and academic motivation prediction and there was the most correlation (Saeid and Eslaminejad 2017). Yusuf (2011) observed self-efficacy beliefs significantly enhanced learning attainment. Motlagh et al. (2011) revealed that self-evaluation, self-directing, and self-regulation are correlated with academic achievement, and among all variables entered in the equation model only self-evaluation and self-regulation were entered. Oyuga et al. (2019) observed that self-efficacy was a vital component of academic performance among orphan students. Ahmadi (2020) observed that all elements of academic self-esteem except success or failure were associated directly with the academic self-efficacy of students and all elements of academic self-esteem except success/failure were related indirectly to academic achievement through academic self-efficacy. Atoum and Al-Momani (2018) found that the majority of students hold a moderate level of perceived self-efficacy and a significant effect of academic achievement on perceived self-efficacy in favor of higher achievement students but no significant effect for gender or the interaction of academic. Research has shown that adolescents with high levels of self-efficacy are more likely to approach problem-solving tasks with confidence and perseverance (Bandura, 1977). They are less likely to be deterred by setbacks or obstacles and more inclined to seek out solutions and overcome challenges. In contrast, adolescents with low self-efficacy may avoid problem-solving tasks altogether or give up quickly when faced with difficulties. Within the educational context, adolescents face various challenges and opportunities as they navigate academic pressures, social dynamics, and personal growth. Problem-solving skills emerge as a crucial life skill that is essential for success in academics, careers, and personal development. Factors such as self-efficacy, cultural background, and gender can influence adolescents' problem-solving skills and their willingness to engage in problem-solving tasks. Therefore, it is essential to

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understand these factors and develop strategies to enhance adolescents' problem-solving skills and promote their overall well-being.

Based on the above rationale the objectives are

- To examine the differences in problem-solving ability and self-efficacy between boys and girls among school-going adolescents.
- To explore the role of District in problem-solving ability and self-efficacy among boys and girls among school-going adolescents.
- To investigate the relationship between problem-solving ability and self-efficacy among boys and girls school-going adolescents.
- To evaluate the influence of self-efficacy on problem-solving ability among boys and girls school-going adolescents.

Hypotheses of the study

- H₀₁ There is no significant difference between boys and girls in problem-solving ability and self-efficacy among school-going adolescents.
- H₀₂ There is no significant difference in problem-solving ability and self-efficacy among boys and girls school-going adolescents with regards to their district.
- H₀₃ There is no significant correlation between problem-solving ability and self-efficacy among boys and girls among school-going adolescents.
- H₀₄ There is no significant influence of self-efficacy on problem-solving ability among boys and girls among school-going adolescents.

METHODOLOGY

Participants

The population for this study consists of school-going adolescents from 14 to 17 years who attend schools in the Paschim Medinipur and Purba Medinipur districts of West Bengal. The sample includes 600 adolescent students selected from eight schools (four in Paschim Medinipur and four in Purba Medinipur). The researcher initially used a convenient sampling strategy to choose these eight schools of two Blocks in two Districts. Following this, the sample of students was selected using a simple random sampling technique.

Method

The current study employed a cross-sectional survey design. The researcher aimed to investigate the relationship between problem-solving ability and self-efficacy among school-going adolescent students. The study employed a cross-sectional survey design to evaluate the problem-solving ability and self-efficacy among school-going adolescent students. The researcher collected data by conducting a survey in several sub-sections of Paschim and Purba Medinipur District in West Bengal.

Tools

The current study targeted school-going adolescents, employing a demographic information sheet alongside two standardized instruments: the Solving Problems Scale and the Self-Efficacy Scale. These instruments were translated and adapted into Bengali by Bikash Chandra Ghorai and Dr. Lalit Lalitav Mohakud (2020). The translation and adaptation process involved six key steps as outlined by Sonnenblick and Rosin (1991): 1) Translating the instrument from the original language to the target language, 2) Creating a synthesized version of the translated instrument, 3) Expert evaluation of the synthesized version, 4) Pre-

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testing the instrument with the target population, 5) Back translation, and 6) Conducting a pilot study.

- 1. Problem-solving Abilities:** To evaluate the problem-solving abilities of adolescents, the study employed a five-point scale developed by Barkman and Machtmes from Purdue University. This scale comprises 24 items, including three negative items (items 5, 9, and 15) and 21 positive items. Positive items are scored on a scale of 4, 3, 2, 1, and 0 for the responses Always, Frequently, Sometimes, Rarely, and Never, respectively. Negative items are scored inversely, from 0 to 4. The total score, ranging from 0 to 96, is derived by summing the scores for both positive and negative items. The internal consistency of the scale was verified using Cronbach's alpha, yielding a coefficient of 0.797. Validity was assessed through the Pearson correlation coefficient, with a reported r value of 0.62, which surpasses the standard threshold.
- 2. Self-Efficacy:** Self-efficacy was measured using the Self-Efficacy Scale, a five-point Likert scale developed by Dr. Arun Kumar Singh and Dr. Shruti Narain, and published by the National Psychological Corporation in Agra, India. This scale, which was translated into Bengali by the investigator and their advisor, consists of 20 items, including four negative items (items 4, 10, 12, and 18) and 16 positive items. Positive items are rated from 5 (Strongly Agree) to 1 (Strongly Disagree), while negative items are scored inversely. The internal consistency of this scale was also tested using Cronbach's alpha, yielding a coefficient of 0.759. The validity, assessed via the Pearson correlation coefficient, produced an r -value of 0.639, exceeding the standard value.

Data collection was conducted with the explicit permission of the head teacher, taking approximately 33-40 minutes. The instruments were administered sequentially to students following each class.

Statistical Analysis

Raw data were collected from 650 school-going adolescents, and after applying data mining and cleaning techniques, 600 data points were individually tabulated in an Excel sheet. The data were then analyzed using SPSS version 20. To assess normality, skewness, and kurtosis tests were conducted, showing that the data were either within or close to the normal range. The investigator utilized various descriptive and inferential statistical methods. Hypothesis testing was performed to evaluate the significance of the mean difference at a 0.05 significance level, and the significance of correlation and regression at a 0.01 significance level.

RESULTS

Table 1: Data Normality Test

Variable	skewness		kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Problem-Solving Ability	-.141	.100	-.402	.199
Self-Efficacy	-.056	.100	-.662	.199

The table shows skewness and kurtosis values for Problem-Solving Ability and Self-Efficacy, used to assess data distribution. Problem-solving ability has a skewness of -0.141 (SE = 0.100), indicating a slight leftward skew, but the distribution is nearly symmetrical. Its

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kurtosis is -0.402 (SE = 0.199), suggesting a flatter, platykurtic distribution. Self-Efficacy shows a skewness of -0.056 (SE = 0.100), also indicating near symmetry with a slight leftward skew. Its kurtosis is -0.662 (SE = 0.199), indicating a similar platykurtic distribution. Problem Solving Ability and Self-Efficacy, exhibit nearly symmetrical distributions with slight leftward skews (Bulmer, 1979). Additionally, both distributions are platykurtic (DeCarlo, 1997), indicating that the data points are more evenly spread out with fewer extreme values than in a normal distribution. Both variables are nearly symmetrical and exhibit flatter distributions with fewer extreme values.

Table 2: Gender wise mean comparison on Problem Solving ability and Self efficacy

Variable		M	S.D.	SE _M	df	t	M.D	Sig. (2-tailed)
Dependent	Independent							
Problem-Solving Ability	Boys	54.66	11.162	.644	598	-.640	-.557	.522
	Girls	55.22	10.117	.584				
Self Efficacy	Boys	67.65	12.420	.717	598	-	-3.503	.001
	Girls	71.15	12.234	.706				

The table shows t-test results comparing boys and girls in Problem-Solving Ability and Self-Efficacy among school-going adolescents. Boys have a mean Problem-Solving Ability score of 54.66, while girls have a slightly higher mean of 55.22. The t-value is -0.640 with a p-value of 0.522, indicating no statistically significant difference between the genders. In Self-Efficacy, boys score 67.65, while girls score higher at 71.15. The t-value is -3.481 with a p-value of 0.001, showing a statistically significant difference, with girls having higher self-efficacy. The null hypothesis holds true for Problem-Solving Ability but is rejected for Self-Efficacy.

Table 3: District wise mean comparison considering role of gender on Problem Solving ability and Self efficacy

Variable			M	S.D.	SE _M	df	t	M.D	Sig. (2-tailed)
Dependent	Role of Gender	Independent							
Problem-Solving Ability	Boys	Paschim Medinipur	54.90	10.979	.896	298	.367	.473	.714
		Purba Medinipur	54.43	11.374	.929				
	Girls	Paschim Medinipur	55.99	10.322	.843	298	1.314	1.533	.190
		Purba Medinipur	54.45	9.883	.807				
Self Efficacy	Boys	Paschim Medinipur	66.41	12.328	1.007	298	-1.726	-2.467	.085
		Purba Medinipur	68.88	12.430	1.015				
	Girls	Paschim Medinipur	73.35	11.318	.924	298	3.156	4.393	.002
		Purba Medinipur	68.95	12.749	1.041				

The table presents t-test results comparing boys and girls from Paschim Medinipur and Purba Medinipur in Problem-Solving Ability and Self-Efficacy. For Problem-Solving

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Ability, no significant difference was found between boys ($t = 0.367$, $p = 0.714$) or girls ($t = 1.314$, $p = 0.190$) from the two districts. This indicates that there is no statistically significant difference in problem-solving ability between girls from Paschim Medinipur and Purba Medinipur among school-going adolescents. In Self-Efficacy, boys also showed no significant difference ($t = -1.726$, $p = 0.085$), though the result was close to significance. However, girls from Paschim Medinipur had significantly higher self-efficacy than those from Purba Medinipur ($t = 3.156$, $p = 0.002$). This indicates that there is a statistically significant difference in self-efficacy between girls from Paschim Medinipur and Purba Medinipur, with girls from Paschim Medinipur having higher self-efficacy among school-going adolescents.

Table 4: Gender wise relationship between Problem Solving ability and Self efficacy

Role of Gender			Self-Efficacy
Boys	Problem-Solving Ability	Pearson Correlation	.107
		Sig. (2-tailed)	.065
Girls	Problem-Solving Ability	Pearson Correlation	.286**
		Sig. (2-tailed)	.000

The table presents Pearson correlation results between Problem Solving Ability and Self-Efficacy among school-going adolescents. For boys, the correlation is weak and not statistically significant ($r = 0.107$, $p = 0.065$). For girls, there is a moderate and statistically significant positive correlation ($r = 0.286$, $p = 0.000$). In summary, while there is no significant correlation between problem-solving ability and self-efficacy among boys, a significant moderate positive correlation exists among girls. This suggests that as problem-solving ability increases, self-efficacy tends to increase as well, particularly among girls of school-going adolescents. This suggests that while no significant relationship exists between these variables for boys, girls with higher problem-solving ability tend to have higher self-efficacy.

Table 5: The influence of Self-efficacy on Problem-Solving Ability among school-going adolescents considering role of gender

	Model	R	R ²	F	Sig	Beta	t	Sig
1	Boys	.107	.011	3.440	.065	.107	1.855	.065
	Girls	.286	.082	26.566	.000	.286	5.154	.000

The table presents regression analysis result shows the influence of Self-Efficacy on Problem-Solving Ability among school-going adolescents. For boys, Self-Efficacy explains only 1.1% of the variance in Problem-Solving Ability, indicating a weak effect. The F-value (3.440) and t-value (1.855) both have p-values of 0.065, which are slightly above 0.05, suggesting that the relationship is not statistically significant. For girls, Self-Efficacy explains 8.2% of the variance in Problem-Solving Ability, indicating a moderate effect. The F-value (26.566) and t-value (5.154) both have p-values of 0.000, confirming a statistically significant positive relationship. In summary, while self-efficacy does not significantly influence problem-solving ability among boys, it does have a significant and positive influence on problem-solving ability among girls of school-going adolescents.

DISCUSSION

The analysis reveals important insights into gender differences and the relationships between Self-Efficacy and Problem-Solving Ability among school-going adolescents, with findings varying by gender and district. The comparison of Problem-Solving Ability between boys and girls shows that boys have a mean score slightly higher than girls. The t-test results indicate no statistically significant gender difference in Problem-Solving Ability. This finding aligns with previous research suggesting that gender differences in problem-solving skills are often minimal or context-dependent (Hyde, 2005), (Jakhar, 2019). In contrast, Self-Efficacy scores reveal a significant gender difference. This suggests that girls exhibit greater self-efficacy than boys, which corroborates other studies that have found gender differences in self-efficacy, with girls generally reporting higher levels (Pajares & Miller, 1994), (Ramírez-Uclés & Ramírez-Uclés 2020). This result supports the notion that self-efficacy can vary by gender and may be influenced by socialization and cultural factors (Bandura, 1997). When examining district-based differences, no significant variations in Problem-Solving Ability were found for either boys or girls. This suggests that geographic location within the studied districts does not significantly impact Problem-Solving Ability, which may indicate uniform educational and environmental conditions affecting these skills. However, there is a notable district-based difference in Self-Efficacy among girls. Girls from Paschim Medinipur have significantly higher Self-Efficacy compared to their peers from Purba Medinipur. This finding underscores the potential impact of local educational practices, community support, or socio-economic factors on self-efficacy (Schunk, 1995). The Pearson correlation results show a weak and non-significant correlation between Self-Efficacy and Problem-Solving Ability for boys (Widiastuti, et al., 2018). This suggests that, for boys, Self-Efficacy does not strongly predict Problem-Solving Ability. In contrast, for girls, there is a moderate and statistically significant positive correlation (Rasyidina et al., 2023). This implies that girls with higher Self-Efficacy are more likely to exhibit better Problem-Solving Ability. The stronger relationship for girls is consistent with findings that self-efficacy can positively influence cognitive processes and problem-solving skills, particularly in females (Zimmerman, 2000), (Caliskan, 2022). Regression analysis further supports these findings. For boys, Self-Efficacy explains only 1.1% of the variance in Problem-Solving Ability, with a weak and non-significant effect. This indicates that Self-Efficacy has minimal influence on boys' Problem-Solving Ability. Conversely, for girls, Self-Efficacy explains 8.2% of the variance, with a moderate and statistically significant effect. This significant influence highlights the role of Self-Efficacy in enhancing Problem-Solving Ability among girls, reinforcing theories that self-belief and confidence are critical for effective problem-solving (Bandura, 1986), (Chytrý et al., 2020) & (Rahmah & Soro, 2022). In summary, while Self-Efficacy does not significantly impact Problem-Solving Ability among boys, it has a significant positive influence on girls. These findings emphasize the importance of considering gender differences in educational strategies and interventions aimed at improving problem-solving skills and self-efficacy among adolescents.

CONCLUSION

This analysis provides critical insights into gender differences and the relationship between Self-Efficacy and Problem-Solving Ability among school-going adolescents. The study finds no significant gender differences in Problem-Solving Ability, yet a notable gender difference in Self-Efficacy, with girls reporting higher levels. This is consistent with prior research indicating that girls generally have higher self-efficacy, potentially influenced by social and cultural factors. While geographic location does not significantly impact Problem-

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Solving Ability, significant district-based differences in Self-Efficacy among girls suggest that local educational and socioeconomic contexts play a role. The correlation and regression analyses reveal that Self-Efficacy has a significant positive impact on Problem-Solving Ability among girls but a minimal effect on boys. These findings highlight the need to address gender differences in educational strategies. By addressing these aspects, educators can better support students in developing both self-efficacy and problem-solving skills, ultimately leading to improved academic outcomes and overall student success.

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