



A STUDY ON MATHEMATICS SELF-EFFICACY OF SECONDARY STUDENTS IN LAMKA, CHURACHANDPUR DISTRICT, MANIPUR

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Abstract: Mathematics self-efficacy plays an important role in defining students' engagement, persistence, and performance in mathematics especially in secondary school level where there is increased academic requirements. This paper examines mathematics self-efficacy of Class IX students in government and private schools of Lamka, Churachandpur District, Manipur, with particular interests in gender- and school-type variations. There is limited empirical research in this localized setting, despite the increased interest in equity of education, which requires referencing a particular question. The research followed a quantitative, normative survey design. Stratified random sampling was used to select a sample of 80 Class IX pupils to be representative of both gender and school type. A Sources of Mathematics Self-efficacy (SMSE) Scale questionnaires were used to collect data with certain modifications according to objectives of the research and analysed with the help of descriptive statistics and independent samples t-tests to compare groups. The results show no significant differences between mathematics self-efficacy, based on gender or school type, which proved that the level of confidence in the students, regardless of their institutional or demographic groups, was relatively homogeneous. These findings indicate that educational activities and experiences in the area can be playing a role in providing equitable education setups. The research outlines the significance of positive self-belief development in mathematics and the necessity to support the student with sustained pedagogy that will help maintain confidence and interest. The results provide important implications to educators, school administrators, and policymakers who would like to enhance mathematics education in the secondary level.

Index Terms- Mathematics Self-Efficacy, Secondary School Students, Government and Private Schools, Gender Differences, Comparative Study, Manipur

INTRODUCTION

Self-efficacy, a major construct in the social cognitive theory of Bandura is the conviction of a person in his or her capacity to organize and carry out actions necessary to take care of the future events (Bandura, 1997). Self-efficacy is a determining force in the context of motivation, perseverance, cognitive engagement and academic success among students in educational setting. Students who possess high self-efficacy are more likely to pursue adaptive strategies to learning, being resilient in the light of academic difficulties, and persisting in actions even in response to a complicated task (Schunk & DiBenedetto, 2020). Self-efficacy is relevant in mathematics education not because the subject is cumulative, but because it is commonly viewed as intellectually challenging. Studies consistently show that the beliefs students hold with respect to their mathematical ability are generally more predictive of future performance than their previous achievement or

measured ability (Pajares & Miller, 1994; Zimmerman, 2000). This means mathematics self-efficacy shapes problem solving behaviour, anxiety management, and motivation to participate in higher order reasoning behaviours, which ultimately shape the students' long-term academic trajectories.

The level of secondary school is an important transitional stage in which students are exposed to greater levels of academic complexity, formal abstraction and performance-based assessment. It is at this stage that students start developing more stable academic self-concepts, which leave a strong influence on choice of subject, career goals, and continuation in STEM-related areas (OECD, 2019). Mathematics self-efficacy is strongly correlated with academic motivation, classroom involvement and achievement performance (Usher & Pajares, 2009). Empirical studies have indicated that high mathematics self-efficacy students have superior conceptual comprehension, problem-solving effective performance, and metacognitive regulation (Ayotola & Adedeji, 2009). On the other hand, low self-efficacy tends to result in avoidance behaviour, anxiety in mathematics and poor academic goals. Thus, the knowledge of how mathematics self-efficacy differs among secondary school students is crucial to the development of effective teaching strategies and student-centered interventions.

The state of Manipur in the northeastern part of India poses a distinct education setting through geographical, socio-cultural, and infrastructural influences. Though the state has registered remarkable achievements in the expansion of access into secondary education, inequality continues to exist in the quality of institutions of learning especially between the government and the privates. Representing a culturally diverse area, Churachandpur District, with Lamka as its administrative and educational centre, schools have different resource conditions and pedagogical practices. In most government schools, barriers like inadequate instructional facilities, large student-teacher ratios as well as limited chances of professional development might affect the classroom practices and learning experiences of the students. On the contrary, the infrastructural availability, the support systems of instructions and academic monitoring processes, in most cases, are relatively good in the case of the private schools. Such contextual variations could have a great impact on the academic self-perceptions of students, especially in areas of learning such as mathematics which require long-lasting cognitive development and instructional supports. Regardless of these contextual realities, the empirical research on mathematics self-efficacy, in particular among students of secondary school in Lamka and the Churachandpur District in general, is still limited. Such a lack of local evidence finds relevance to the present need to carry out an organized study relating to both the psychological and academic experiences of students who study in this area.

Comparative research designs provide useful data on the effects of institutional settings on academic beliefs and results of learners in government and private schools. It shows that school type may affect the self-efficacy of students based on the differences in the quality of instruction, teacher expectations, classroom atmosphere, and academic supports systems (Chiu & Xihua, 2008; Klassen & Tze, 2014). A comparison between mathematics self-efficacy by school type enables a subtle perspective of structural and pedagogical disparities that can influence learner learning. This kind of comparative analysis is especially applicable to the Indian educational context where parallel schooling systems exist, and in most cases have contrasting policy and resource frameworks. The awareness of these differences can be used to guide fair educational planning and specific remedies to improve mathematical confidence and competence of students.

REVIEW OF RELATED LITERATURE

Self-efficacy is used to refer to how individuals evaluate their beliefs about their ability to arrange and carry out actions necessary to achieve specified performance levels (Bandura, 1997). In comparison to general self-confidence or self-esteem, self-efficacy is focused and task-specific due to which it is more likely to be applicable in academics where the expectations of performance vary by subject. According to Bandura (1986), self-efficacy beliefs determine activities people undertake, the strength to undertake the activities despite obstacles, investments in completing the tasks, and feelings toward the academic tasks. Self-efficacy is well known to be a strong indicator of academic involvement and performance in both subject areas in educational psychology. It defines goal-setting behaviours, strategic processes, and resilience in the course of learning activities among students (Zimmerman, 2000).

Mathematics self-efficacy pertains to the belief held by the students that they are able to appropriately handle mathematical tasks and mathematical problems successfully (Pajares & Miller, 1994). Mathematics self-efficacy is a better predictor of mathematics achievement more than previous achievement, aptitude or even the overall intelligence (Hackett & Betz, 1989; Pajares & Graham, 1999). Students who had high mathematics self-efficacy have shown to approach mathematical tasks more extensively, adopt positive cognitive and metacognitive strategies and show more perseverance in faces of challenging problems. On the contrary, low self-efficacy students tend to develop mathematics anxiety, discouragement and avoidance tendencies, which

tend to have negative influences on performance (Ashcraft & Krause, 2007). The perceptions of mathematical ability in students affect the choice of subjects, the continued study of upper levels of mathematics, and the goals of pursuing career opportunities in the field of science and technology (OECD, 2019).

Male students are said to have expressed more mathematics self-efficacy than the female students even after the achievement level has been adjusted (Else-Quest et. al., 2010). Social perceptions of mathematics as a male domain of socialization may adversely affect the female students in matters of their confidence and self-esteem even though they might be performing well or even better than the boys in academics (Eccles, 2011). When favourable learning conditions and fair pedagogical practice exists, the differences between the genders are very low or absent (Else-Quest et al., 2010).

Research has revealed that students of the private schools tend to claim higher levels of academic self-efficacy, which can be explained by the well-organized academic stimuli, closer supervision, and higher stress on academic performance (Chiu & Xihua, 2008). School type alone does not determine student outcomes. Studies indicate that good teaching practices, good school climate, and good teacher-student relationships can balance out structural constraints and build a strong self-efficacy belief despite the institutional environment (Klassen & Tze, 2014).

RESEARCH GAP

Although there is a rich literature on mathematics self-efficacy in the international literature, there are many gaps in our knowledge about Indian, especially in the northeastern regional contexts. There is a dearth of empirical research on mathematics self-efficacy in secondary school students in Manipur, and Churachandpur District in particular. The specific socio-cultural and educational peculiarities of this area require the use of local studies instead of depending on the generalized national or international results. There is little research that has also investigated the interaction between gender and school type on mathematics self-efficacy on a single empirical study. The existing body of research concentrates on either gender or institutional differences, ignoring possible effects of interactions. Most research gives importance to outcome achievement without paying enough attention to the psychological constructs that inform academic performance. Considering mathematics self-efficacy as a dependent variable would bring more profound understanding to the process of learning in students and motivational orientations. Considering these gaps, the proposed study aims at exploring mathematical self-efficacy among, Class IX students of government and private schools in Lamka, Churachandpur District, with particular consideration to differences on gender and on an institutional basis. This study will add contextually based evidence to the existing discourse on mathematics education and facilitate the creation of specific educational intervention.

SIGNIFICANCE OF THE STUDY

It is quite evident that there exists a great deal of research that lacks empirical research on mathematics self-efficacy at the district level especially in northeastern India. The available literature on the Indian studies is on urban or metropolitan setting, thus, restricting its applicability to other regions like Churachandpur that may have unique socio-cultural and educational features. The lack of local empirical analysis makes it an acute knowledge gap on the role of contextual factors in development of mathematics self-efficacy among students in this region. Moreover, not many studies have critically reflected on the gender based and school type-based disparity in mathematics self-efficacy together. The research gap requires filling to ensure context-sensitive educational approaches in accordance with the regional demands.

The results of the current research will provide useful information to curriculum developers, teacher educators, and policymakers. The insight into the differences in mathematics self-efficacy may inform the formulation of learner-centered instructional plan, formative assessment activities, and teacher professional development plans to encourage students to develop positive mathematical identities. In teacher practice, the informed differentiation instruction, motivational scaffolding, and encouraging classroom actions may depend on the awareness of the self-efficacy levels of students. Evidence-based knowledge can facilitate inclusive distribution of resources and interventions in government and non-government schools to policymakers and school administrators. Considering the level of correlation between self-efficacy and academic achievement, the improvement of mathematical self-efficacy of learners can positively influence the learning outcome, decrease the gap in the achievement of outcomes, and help students maintain interest in mathematics. Through an empirical investigation of self-efficacy among secondary students in Lamka, the current research adds to a more profound explanation of the interaction between psychological factors and institutional settings in

determining the educational outcomes. Finally, the results will be used to advocate evidence based educational change that facilitates equity and excellence in mathematics education.

STATEMENT OF THE PROBLEM

The problem of the study can be stated as “A Study on Mathematics Self-Efficacy of Secondary Students in Lamka, Churachandpur Districts, Manipur.” It examines mathematics self-efficacy among secondary students in Lamka, Churachandpur, addressing gaps related to gender and school type to support improved learning outcomes and equitable mathematics education.

DEFINITION OPERATIONAL KEY TERMS

Mathematics: It is one of the subjects that is taught in school, knowledge of which includes the topics of numbers, formulae and related structures, shapes and the spaces in which they are contained and quantities and their changes.

Mathematics self-efficacy: It can be defined as what people believe or think about their capabilities in mathematics (Bandur,1997). In other words, mathematical self-efficacy is the belief that any individual holds regarding his or her ability to handle mathematics tasks, ranging between comprehension and problem-solving.

Secondary: Students who are in grade level IX and X.

OBJECTIVES OF THE STUDY

1. To compare the Mathematics Self-Efficacy of Class IX male students of Government and Private Schools in Lamka, Churachandpur District, Manipur.
2. To compare the Mathematics Self-Efficacy of Class IX female students of Government and Private Schools in Lamka, Churachandpur District, Manipur.
3. To compare the Mathematics Self-Efficacy of Class IX male and female students in Lamka, Churachandpur District, Manipur.
4. To compare the Mathematics Self-Efficacy of Class IX students of Government and Private Schools in Lamka, Churachandpur District, Manipur.

HYPOTHESES OF THE STUDY

1. There is no significance difference between the Mathematics Self-Efficacy of Class IX male students of Government and Private School in Lamka, Churachandpur District, Manipur.
2. There is no significance difference between the Mathematics Self-Efficacy of Class IX female students of Government and Private School in Lamka, Churachandpur District, Manipur.
3. There is no significance difference between the Mathematics Self-Efficacy of Class IX male and female students of Government and Private School in Lamka, Churachandpur District, Manipur.
4. There is no significance difference between the Mathematics Self-Efficacy of Class IX students of Government and Private School in Lamka, Churachandpur District, Manipur.

DELIMITATION OF THE STUDY

1. The study is delimited to the class IX students of the academic session 2023.
2. The study is delimited to two Government high schools and two Private high schools in Lamka, Churachandpur District, Manipur.

METHOD OF THE STUDY

The investigator has used normative survey method as per the requirement of the study and to suit the objectives of the study.

POPULATION

All the secondary school students of Lamka, Churachandpur Distirct, Manipur is taken as the population of the present study.

SAMPLE AND SAMPLING

For the study, 80 secondary school students were selected by using stratified random sampling techniques as sample from Two Government High Schools and Two Private High Schools in Lamka, Churachandpur District, Manipur. Out of these 80 sample the investigator had randomly selected 20 samples each from each school of which 10 each from male and females respectively.

TOOLS USED

The investigator used Sources of Mathematics Self-Efficacy (SMSE) Scale questionnaires with some modifications based on objectives of the study as a tool to collect necessary data. The questionnaire is a 5 points Likert scale developed by Usher, E.L., & Pajares, F. (2009). It was tested and rendered valid in the research of Kandemir and Perkmen in their article "Examining Validity of Sources of Mathematics Self-efficacy Scale in Turkey" had an overall Cronbach alpha value of 0.84 and value of composite reliability as 0.84, marked to be accepted.

DATA COLLECTION

Data were collected after obtaining institutional permission. Class IX students completed a mathematics self-efficacy scale during school hours. Participation was voluntary, anonymity ensured, and ethical guidelines strictly followed to maintain confidentiality, accuracy, and minimal classroom disruption.

STATISTICAL TECHNIQUES USED

Data were summarized with descriptive statistics mean and standard deviation, and the data between independent groups were analysed with independent samples t-tests at a level of statistical significance 0.05.

DATA ANALYSIS AND INTERPRETATION

Hypotheses 1

There is no significance difference between the Mathematics Self-Efficacy of Class IX male students of Government and Private School in Lamka, Churachandpur District, Manipur.

Group	N	Mean	SD	t-value
Government School	20	68.3	7.68	0.657
Private School	20	63.33	9.61	

*df=38, Critical t-value at 0.05 =2.042

Interpretation

The obtained t -value 0.657 is not significant at the 0.05 level, indicating that male students from government and private schools do not differ significantly in their mathematics self-efficacy. Therefore, the null hypothesis is accepted.

Hypotheses 2

There is no significance difference between the Mathematics Self-Efficacy of Class IX female students of Government and Private School in Lamka, Churachandpur District, Manipur.

Groups	N	Mean	SD	t-value
Government School	20	66.6	16.55	0.374
Private School	20	68.2	9.24	

*df=38, Critical t-value at 0.05 =2.042

Interpretation

The calculated t -value 0.374 does not reach the critical t-value at 0.05 level of statistical significance,

indicating no meaningful difference in mathematics self-efficacy between female students of government and private schools. Thus, the null hypothesis is accepted.

Hypotheses 3:

There is no significance difference between the Mathematics Self-Efficacy of Class IX male and female students in Lamka, Churachandpur District, Manipur.

Groups	N	Mean	SD	t-value
Male	40	66.45	8.79	0.378
Female	40	67.4	13.26	

*df=78, Critical t-value at 0.05 =1.9909

Interpretation:

The obtained t -value 0.378 indicates no statistically significant difference between male and female students in terms of mathematics self-efficacy. Hence, the null hypothesis is accepted.

Hypotheses 4:

There is no significance difference between the Mathematics Self-Efficacy of Class IX students of Government and Private School in Lamka, Churachandpur District, Manipur.

Groups	N	Mean	SD	t-value
Government School	40	67.45	12.77	0.406
Private School	40	66.43	9.48	

*df=78, Critical t-value at 0.05 =1.9909

Interpretation

The obtained t -value 0.406 is not statistically significant at 0.05 level of significance. This indicates that the type of school does not significantly influence students' mathematics self-efficacy. Hence, the null hypothesis is accepted.

FINDINGS OF THE STUDY

The findings are described according to the stated objectives and hypotheses of the study and are supported by the analysis of the data collected with the help of standardized measurement and statistical testing.

Findings of Hypothesis 1

This hypothesis tested whether there exists a significant difference in mathematics self-efficacy of male students of government and private schools. The comparison has shown that the average score related to self-efficacy of the male learners in both types of schools was very much similar. Even though there were some minimal differences in the numbers, the differences did not significantly differ.

This result shows that male students, irrespective of whether they studied in government schools or private schools, had similar scores about their confidence in their mathematical abilities. The finding indicates that institutional type might not be a decisive factor in determining how male students think about their competence in mathematics. The similarity may be as a result of the shared curricular frameworks, exposure to the same assessment patterns, and similar expectations of instruction.

Findings of Hypothesis 2

This hypothesis aimed at establishing the presence of a significant difference between mathematics self-efficacy of the female students in terms of the government and private school. The study found no statistically significant difference in the two groups.

This result indicates that both groups of female students have equal levels of confidence in their learning and their ability to perform mathematical tasks in both institutional settings. This similarity in the self-efficacy level could indicate the rising level of educational equity, better access to the resources on learning, and enhancements in promoting female engagement in academic and STEM-related fields. It can also show that

the instructional practices and academic demands in all types of schools are growing more similar, which helps to minimise traditional differences in learning experiences.

Findings of Hypothesis 3

This hypothesis tested the differences in mathematics self-efficacy between Class IX students in terms of gender. Results showed that male and female students had no statistically significant difference in self-efficacy. The finding is remarkable since it debunks earlier beliefs and part of previous studies which proposed male dominance in mathematical confidence. The lack of a strong gender gap can be an indicator of a slow, but systematic change of the societal attitudes, classroom culture, and educational opportunities that facilitate the establishment of gender equality in the learning of mathematics. It also suggests that both male and female students in the research setting might be getting similar encouragement and instructional support, which leads to equal confidence in mathematics.

Findings of Hypothesis 4

The hypothesis tested whether there was a significant difference in mathematics self-efficacy between students studying in government and private schools regardless of gender. The findings showed no statistically significant difference between the two groups.

This observation suggests that school type in itself does not have a significant effect on the beliefs that students hold regarding their math abilities. Students in both types of schools seem to evolve the same degree of self-efficacy, despite the possible differences in infrastructure, teaching materials, or administrative frameworks. This could mean that there is a commonality in pedagogical practices, curriculum delivery and assessment practices among schools in the region.

DISCUSSION

The present study investigated mathematics self-efficacy in Class IX students of the government and private schools of Lamka, Churachandpur District, Manipur and found no statistically significant differences between the gender and school type. This result denotes rather homogeneous degree of confidence in mathematical abilities among pupils, which states that contextual and pedagogical factors can play a more significant role than demographic features. These findings are consistent with modern studies that point to the progressive narrowing of gender-based disparities in academic self-conceptions, specifically in the contexts where educational accessibility, curriculum exposure, and teaching strategies are becoming more and more uniform (OECD, 2019; Hyde et al., 2008).

The lack of school types difference also contributes to the emergence of evidence that institutional affiliation is not the sole determinant of students' motivational beliefs and academic confidence. Instead, aspects like teacher quality, instructional methods, classroom atmosphere, and meaningful teacher-student interactions seem to have even a greater effect on students' self-efficacy (Hattie, 2009; Klassen & Tze, 2014). Considering the viewpoint of Bandura (1997) of the social cognitive theory, mastery experiences, social persuasion, and vicarious learning build self-efficacy, and these can all be replicated across government and non-government schools that follow the same curricular frameworks.

Socio-culturally, the rise in gender equity awareness coupled with continuous focus on education as an avenue towards social mobility in the region could have led to similar confidence between boys and girls. These results contradict conventional beliefs of gender or institutional privilege in mathematics education. It emphasises on the significance of equal opportunities in instructional practices, continuous teacher professional development and teaching-learning relationships in nurturing mathematical self-beliefs among students. In general, these findings encourage a policy and practice shift in which teaching quality and student-centered instructional approaches should be the main consideration rather than the school type-related characteristics (Schunk & DiBenedetto, 2020).

SUGGESTION FOR FURTHER RESEARCH

To investigate the nature of mathematics self-efficacy growth across time and critical periods of educational transition, future studies should focus on longitudinal design. The inclusion of other variables, including academic achievement, motivation, self-regulation, and mathematics anxiety would better explain the experiences of learners. Using qualitative or mixed-method approaches might also help to shed more light on the perceptions of students, interactions in classrooms, and situational factors that influence self-efficacy. Generalizability would also improve with comparative studies across regions and across school systems. These

multidimensional studies have the potential to deepen theoretical knowledge and dictate evidence-based learning activities to promote long-term mathematical efficacy and interest in students.

CONCLUSION

The paper investigates mathematics self-efficacy in Class IX students in both government and private schools in Lamka, Churachandpur District, Manipur with special reference to gender and institutional variations. The results showed no gender or school type statistically significant differences in mathematics self-efficacy of students, which suggests a comparatively homogenous level of mathematics learning confidence among the study participants. This indicates that students in the research setting might be receiving similar teaching conditions, curriculum coverage, and motivation, irrespective of institutional membership. Educationally, these findings are positive, with the gradual decrease of traditional differences that were typically based on gender and school type. The findings indicate that there is a potential to believe that the existing pedagogy and curriculum structures are leading to more equitable learning processes. Meanwhile, the lack of dramatic differences highlights the value of maintaining the inclusive approach to teaching that can accommodate every learner but not only specific population groups. On the whole, the research supports the significance of mathematics self-efficacy nurturing as a basic element of successful teaching and learning.

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