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Self-Efficacy in Mathematics Instruction for Teachers of the Visually Impaired: A Critical Analysis of Punjab Special Education System

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ABSTRACT

This study explores the lived experiences of teachers of the visually impaired (TVI) regarding their mathematics teacher self-efficacy within the Punjab Special Education System. The central problem is framed by the "efficacy gap", the disparity between pedagogical demands and an educator's belief in their capacity to overcome systemic barriers which serve as a critical determinant of educational quality for students with visual impairment (SVI). Employing a qualitative phenomenological approach, the study utilized in-depth, semi-structured interviews with ten teachers purposively selected from all ten divisions of Punjab. Thematic analysis of the narratives revealed that the "theory-practice confidence gap" is a manifestation of a profound deficiency in Pedagogical Content Knowledge (PCK), specifically a disconnect between general subject-matter expertise and specialized non-visual instructional strategies. Furthermore, the findings identify pervasive resource scarcity, severe time constraints, and a restrictive policy landscape as significant environmental suppressors of teacher efficacy. The study concludes that enhancing teacher confidence requires a fundamental shift toward hands-on, PCK-focused professional development and targeted systemic support to mitigate environmental stressors. This research offers a strategic agenda for reforming teacher training and policy to foster a more equitable educational future for visually impaired students in Punjab.

***Keywords**: Teachers of visual impairment, (TVI), Mathematics teacher self- efficacy, (MTSE), Students with visual impairment, (SVI)*

INTRODUCTION

The challenge of presenting a meaningful mathematics curriculum to people with visual impairment is a deep and complex dilemma. It is based on a fundamental tension between the inherently visual nature of the design of mathematical instruction and the largely non-visual learning modalities used by these learners. This dialectic is especially pronounced in the case of the Punjab Special Education System, where there is often a comorbidity between systemic limitations and pedagogical obstacles. Mathematics has global recognition as a foundation of modern education as it is sometimes called the "poetry of logical ideas" by teaching learners some essential abilities to respond to situations and solve problems. Its significance goes beyond pure computation; it is the basis substratum for progress in the fields of science, technology and engineering, and (by logical extension) states socio-economic vitality (Iqbal et al., 2020; Maqbool & Ashraf, 2023).

Mathematical proficiently students are an important doorway to a wide range of academic and professional alternatives for the general student population. Nonetheless, students with visual impairments face unique and significant challenges in this direction. The nature of mathematics, its intrinsic character, is deeply visual, based on a symbolic notation, graphical representation, and spatial relationships that are inherent to a geometry discourse, and the visual configuration of complex relations of algebra. Instructional strategies geared toward non-visual learners require an extensive format of pedagogical strategies which can synthesize abstract visual data into accessible, non-visual modalities (Parveen et al., 2023; Ahmad et al., 2024).

The history of mathematics is laced with the accomplishments of people with visual impairments, including Bernard-Morin in geometry and Professor Nemeth, whose devising of the standard braille code for mathematical notation is testimony to the fact that visual impairment is not a basis for mathematical feebleness. These accomplishments, however, frequently represent isolated exceptions highlighting access to systemic barriers experienced by students with severe visual impairments (SVI). Within the sphere of the Pakistani special education system, especially the province of Punjab, students with SVI are subject to the standardized national curriculum. Although this policy is based on the principle of equity, its implementation is facing enormous challenges in practice. The curriculum requires a great deal of adapting to be accessible, and includes the need for Braille textbooks, use of tactile learning aids, and attributably the most important is that the instruction needs to be provided by teachers who have specialized expertise in these approaches (Ali, 2021; Nahar et al., 2022).

Despite all these efforts, a continued discrepancy in levels of mathematical achievement of students with visual impairments (SVI) and sighted students is reported widely. This gap tells us that the difficulty is not only expressly in the inadequacies of the curriculum or in the ability of the students, but also in the pedagogical linkage, which mediates the instruction. Within the SVI classroom of mathematics, the teacher is the key agent of access. The instructor must not only have strong subject content skills but also have a unique set of skills to conceptually and verbally communicate content without the need for use of visual modalities. Such competencies include generation of mental imagery for learners, dynamic adaptation of instructional materials and the deployment of multisensory pedagogical strategies. Because of this, the effectiveness of these educators is a critical variable in the educational trajectory of students with visual impairments (Cabral-Gouveia et al., 2023: Daniel, 2025).

To analyze this complex problem, this study constructs an integrated theoretical framework that combines two seminal theories: Lee Shulman's work on teacher knowledge and Albert Bandura's Social Cognitive Theory.

- Shulman's concept of Pedagogical Content Knowledge (PCK) defines the specialized knowledge a teacher must possess the knowledge of how to represent abstract mathematical concepts non-visually, understand SVI-specific misconceptions, and use adaptive tools like the Nemeth code.

- Bandura's theory of self-efficacy provides the psychological lens to understand a teacher's belief in their capacity to apply that PCK effectively, especially in the face of significant challenges.

In the integrated model, Pedagogical Content Knowledge (PCK) is the psychological "activator" of self-efficacy. Though a teacher may be provident of domain specific knowledge, exposure to extended barriers in the environment that lead to repeated failure can lead to a significant decline in self-efficacy, thus engendering task avoidance and reduced effort. Consequently, for teachers to portray effectiveness, it is mandatory that they retain specialized knowledge (PCK) along with a tenacious belief in their capacity to put that knowledge in. This model thus provides an explanation of how environmental factors, e.g.,

availability of resources and policy contexts, and personal factors, e.g., PCK and belief systems, interact reciprocally to affect teacher behavior in which self-efficacy is the key factor to reduce the inhibitory effects to teachers to activate teacher's special knowledge.

Research Objectives

The research study intends to:

1. Explore the mathematics teacher self- efficacy of teachers of visual impairment at elementary and secondary level in Punjab.
2. Critically analyze the factors affecting the mathematics teacher's self-efficacy at elementary and secondary level in Punjab.

LITERATURE REVIEW

The education of students with visual impairment is a specialized area based on the understanding that, although the lack of sight has a profound effect on learning processes, it is not totally a preponderance. A basic premise supported throughout the literature argues that the cognitive abilities of students with severe visual impairment (SVI) are not necessarily inferior when compared with their sighted counterparts. Nevertheless, the development of these capacities is highly dependent on the caliber and diversity of instructional experiences. Early life experiences are found to be very important, and without early intervention and experience with a wide range of stimuli, cognitive development may be hampered, not by the visual impairment itself, but by the lack of opportunity which flows from it (Hussain et al., 2022; Aftab et al., 2024).

An important construct in this field is sensory compensation in which individuals who are visually impaired (SVI) learn how to navigate through and understand their physical environment by relying more on alternate modalities, especially haptic and audio. Accordingly, the pedagogical strategies created for SVI must have a multisensory nature. In the case of mathematics, the need to move on from visual demonstrations to include tactile graphics, manipulative devices such as the Taylor frame or abacus, and verbal descriptions through a technique which is well described. Empirical evidence suggests that such a multisensory approach significantly improves mathematical achievement in SVI learners, therefore proving that the real difficulty for the learner is not understanding conceptually but visual to non-visual conversion (Rafiq et al., 2024; Khan & Seelro, 2025).

Furthermore, mastery of the curriculum in the conventional academic environment for students with severe visual impairment (SVI) is heavily dependent on the acquisition of competencies addressed in the Expanded Core Curriculum (ECC). The ECC covers a variety of specific skills needed by people with disabilities as prerequisites for academic learning, including Braille literacy skills, orientation and mobility (O&M) skills, use of assistive technology, and skills in social interaction. Empirical evidence supports the value of mastery of Braille in relation to achievement in content areas such as mathematics while O&M competencies are equally critical as they develop the autonomy and self-assurance needed for membership in a broader world of social and academic interaction. Consequently, the educational setting for SVI is based on a dual-track paradigm in which learning in core academic content is inextricably interwoven with learning these foundational adaptive skills (Malik & Khan, 2022; Hanif et al., 2024).

The establishment in the literature is that mathematical instruction with students that have visual impairments necessitate specialized pedagogical content knowledge. This requirement is not limited to general pedagogy, and it includes technical skills of using essential adaptive tools. Such tools include the abacus for computation, the Nemeth Code for Braille mathematical notation, and principles for the design

of effective tactile graphics for the communication of spatial information in geometry and in data analysis. This high technical competency level puts in perspective the difficulty of developing a strong self-efficacy (Mughal et al., 2020; Alotaibi et al., 2023).

Broader educational research has established firmly the relationship between high teacher self-efficacy and a variety of positive outcomes. These outcomes include increased persistence with struggling students, an increased tendency to use innovative pedagogical methods, and a strong positive correlation with student academic achievement. This body of literature thus highlights the importance and impact of examining teacher beliefs on the process of educational improvement (Naqvi, 2024; Mishal et al., 2024).

The present study is situated within the systemic context of that of Punjab, Pakistan. An investigation of policy documents and available research uncovers environmental factors that seem likely to impact on teacher efficacy. These include an historic dependence on segregated institutions, significant inconsistencies between inclusive education policy and on-the-ground implementation, and an ongoing lack of professional development and provision of focused and effective targeted support to teachers.

RESEARCH METHODOLOGY

The study uses qualitative methodology and phenomenology to explore the lived experiences of teachers of visual impairment (TVI) in relation to mathematics teacher self-efficacy towards students with visual impairment at elementary and secondary level in Punjab. The study population was the teachers of visual impairment (in special education) of the Punjab Special Education system who were working in elementary/ secondary levels. A purposive sample of ten teachers from among the one of ten divisions in Punjab was taken. In-depth interviews were carried out using a semi-structured interview guide which is attached to Appendix A.

DATA ANALYSIS, INTERPRETATION AND FINDINGS

This section develops in depth thematic analysis of ten interviews with mathematics teachers of students with visual impairment (SVI). The results show that the self-efficacy of teachers is not an inherent personal attribute but is a dynamic product of the complex interaction of professional preparation, availability of resources, collaborative support systems and institutional policies. In the absence of effective teachers, students with visual impairments face systemic barriers that limit their access to and success in mathematics-a critical gateway to STEM disciplines-and broad economic opportunity. This analysis unravels the major challenges and identifies strategic levels for systemic improvement.

In conducting qualitative data analysis, interview transcripts were subjected to thematic analysis. The procedure began with open coding, during which the narrative data of the ten interviews were segregated into discrete concepts and preliminary codes. This basic step led to granular understanding of the experience of teachers. Subsequent axial coding was used to explore interrelationships among these codes as well as to try to expand them into broader categories and subcategories. This important second step supported deeper understandings in the fundamental mathematical concept of math teacher self-efficacy. The last themes presented in the dissertation were the result of this rigorous coding process itself.

The present findings are based on a qualitative analysis of ten semi - structured interviews with mathematics teachers in special school settings. The interviews were designed to elicit detailed narratives with respect to the experiences, beliefs and practices of teachers related to adapting the teaching of mathematics for students with visual impairments. This methodological design has the advantage of providing deep, contextual knowledge about the experiences of the people we study, taking us far beyond the surface of

these experiences, and revealing the mechanisms that are implicit in participant's self-efficacy. The participant cohort constitutes a diverse cross section of participants representing a range of experience, certification and school environment. Such diversity is necessary to identify the interactions of different contextual factors that affect a teacher's confidence and competence. A summary of participant demographics is provided in Table 1; the following table forms a critical reference and provides immediate context for quotes and experiences discussed thereby allowing for nuanced cross reference of what the teachers were saying with their professional background and the institution in which they work.

Table 1: Participant Demographics Overview

Participant ID	Years of Teaching Experience	Grade Level(s)	Terminal Degree and Certification	School Setting	Material Resources Level
Teacher A	8	Elementary Level	MA Special Education	Special School	Medium
Teacher B	15	Secondary Level	PhD Special Education	Special School	High
Teacher C	12	Secondary Level	MA Special Education	Special School	Low
Teacher D	20	Elementary Level	M. Phil Special Education	Special School	High
Teacher E	10	Secondary	MA Special Education with Math	Special School	Medium
Teacher F	5	Elementary Level	MA Special Education	Special School	Low
Teacher G	18	Secondary Level	M. Phil Special Education	Special School	High
Teacher H	7	Elementary School	Math, MA Special Education	Special School	Medium
Teacher I	14	Elementary School	MA Special Education	Special School	Medium
Teacher J	22	Secondary School	MA Special Education	Special School	Low

The analysis serves to prove that the basic root of an educator's self-efficacy represents the most determinant factor as far as its robustness and resilience is concerned. Two clearly divergent paths emerged from the accounts given by the teachers: a reactive, "trial-and-error" approach based on lack of formal preparation, and a proactive, specialist approach based on a considered aggregation of specialized knowledge. These trajectories directly relate to the quality and characteristics of the "mastery experiences" that contribute to a teacher's degree of confidence about his or her abilities.

The "Trial-and-Error" Pathway: Efficacy Built on Unstable Ground

For a lot of teachers, especially those with general backgrounds, the first time interacting with a student with visual impairment (SVI) is a critical moment with a lack of previous training. Compelled to work out instructional strategies in the field, educators like Teacher A highlight a systemic problem: the assignment of specialized instructional design work to those with inadequate qualifications to perform it. This model is incredibly inefficient, and teachers waste their emotional energy rebuilding pedagogical tools that already exist in the realm of education of the setting.

More critically, this pathway creates a downward spiral of efficacy. The errors that result through trial-and-error are reflected in failed lessons and student frustration, i.e. negative experiences of mastery that result in a lack of confidence on the part of the teacher. As a result of this, instruction becomes less ambitious, and the outcome for students is poorer and reinforces the perception of teacher inadequacy. Ultimately the resilience that the educators showed is indicative of a system that shifts professional development to individuals. These dynamic breeds a survivor-professional identity, based on daily classroom management and not the scholarly identity that is mastery and craft.

The Specialist Pathway: Efficacy Built on a Deliberate Foundation

In contrast with the "trial and error" model, the specialist pathway is marked by formal certification and purposeful professional development. For educators like Teacher B, this training gives them a definitive place to start: "I wasn't guessing." The pathway replaces the component of invention with the component of application that provides teachers with a conceptual framework and fluency in standardized applications such as Mathematics Braille and tactile graphic design. Based on an understanding of the laws of non-visual learning - how a student constructs spatial concepts and processes - specialists are characterized by cognitive empathy that helps them predict misconceptions before they even appear.

This underlying training serves as an effective multiplier with a series of cascading effects. First, it leads to the development of individual competence (first-order effect), and this provides consistent success in the classroom and positive experiences of mastery (second-order effect). Beyond the classroom, a highly efficacious teacher engages with the outside world in a different way: they advocate for resources by a position of expert authority, are expert in using advanced technologies, and act as mentors for their colleagues. Ultimately, prospective investments in specialized training turn the teacher from a passive participant of difficult circumstances into a proactive participant of inclusion in an active role, thereby developing institutional long-term capacity.

The Skills of Adaptation: Pedagogical Strategies and Material Resources

In addition to the underlying preparation of educators, a relevant arena to focus on is the instruments and strategies that are deployed by educators in instructional practice. The fruitful adaptation of mathematics to students with visual impairment requires a specific competence in both teaching methods and teaching means. Analysis of interview data reveals that this competency lies on a continuum between the low techniques of tactile materials and the high technique of assistive devices. Nonetheless, the data also reveals a critical difference; access to these resources is not equivalent to the deep pedagogical content knowledge that is required of these resources to be used effectively. This is described as a discrepancy, which is called the "implementation gap", and it represents a main level of interposition in the way of quality teaching and significantly changes the level of the sense of self-efficacy of teachers.

The Spectrum of Resources: From Low-Tech to High Tech

A mathematics curriculum geared for students with visual impairment (SVI) is grounded in a multimodal toolkit which can be divided into three key allowances: Foundational Low-Technology Resources - tactile graphics and manipulatives which form the foundation of this structure by providing tangible analogues of outfitted traditional visual schematics; if lacking in this domain, they deprive students of necessary sensory scaffolding essential for understanding geometric forms and functional relationships; Specialized Code Systems and especially the Braille Code for Mathematics (only Nemeth Code) is a non-negotiable but challenging cornerstone, where - as Teacher C argues - an inability to Mastery of pedagogical efficacy is not accomplished by being merely isolated on one device, but by the harmonious orchestration of the entire

spectrum of modalities. Excessive use of low-technology manipulatives can hinder the move to abstract mathematical reasoning; excessive use of high-technology tools may eliminate the need to develop important foundational ideas. Consequently, the "proficient teacher" must scientifically choose the most suitable modality to match certain pedagogical goals to develop global mathematical literacy.

The Implementation Gap: Beyond Access to Pedagogical Content Knowledge

The research presently in hand suggests a wide implementation gap and considerable disconnect between the availability of resources and the pedagogical content knowledge required to use them effectively. Teacher E sees how ownership of technology is different from having the pedagogical know-how to use the technology in illuminating abstract mathematical concepts like quadratic functions. For learners without the capabilities of visual acuity, pedagogical content knowledge requires educators to master content that is mathematical, tactile representation, and precise auditory description at the same time. This gap is taken to the extreme with the challenges posed by Nemeth Code; an instructor's lack of fluency in this symbolic system creates an insurmountable barrier and, hence, limits the student's access to higher course content. For this reason, educators are forced to do high-stakes, real-time acts of translation. They need to constantly convert images and mathematical notation into touch or sound. The burden of such translation places great cognitive demand and is one of the main causes of teacher burn-out. In this context, teacher self-efficacy is defined in terms of beliefs in one's ability to be an accurate and swift translator of mathematical concepts. To increase efficacy, systemic reforms need to go beyond the provision of devices and prioritize the reduction of cognitive load through longer preparation time and the use of automatic translation tools, as well as through collaborative frameworks for support.

Table 2: Adaptive Strategies and Technologies Inventory

Strategy/Technology	Mentioned by	Stated Proficiency Level (Self-Reported)	Context of Use / Noted Challenge
Braille Code	Teacher B, Teacher C, Teacher D	Expert (B, D), Lacking (C)	"Essential for algebra and beyond"; "Struggle with for higher-level algebra"
Tactile Graphics	Teacher B, Teacher D, Teacher A	Expert (B, D), Novice (A)	"Essential for geometry and graphing"; "Figuring it out on my own"
JAWS Screen Reader	Teacher E, Teacher G	Competent (G), Aware/Novice (E)	Used for accessing digital text; "Knowing how to use it to explain a function is different"
Refreshable Braille Display	Teacher E, Teacher B	Expert (B), Aware (E)	"Can even show graphs"; Essential for real-time access to digital math content
Manipulatives (e.g., blocks)	Teacher D, Teacher A	Competent (D, A)	Foundational for elementary concepts; "Good for basic concepts but limited for abstract ideas"
Large-Print Materials	Teacher H	Competent	Used for students with low vision; simpler adaptation but not sufficient for all VI students

The analysis proves beyond any doubt that teacher self-efficacy is not an individual characteristic developed in a microcosm. It is profoundly shaped, and in many cases determined by the ecosystem around it. This "system of support" has two basic elements: the human infrastructure of collaboration with specialists and peers and the institutional scaffolding of administrative leadership, budgets and time. When these systems are strong, they can magnify a teacher's effectiveness and bolster his or her confidence. When they are weak or absent, they are the major source of stress and frustration corrosive to self-efficacy.

Human Infrastructure: The Lifeline of Collaboration

Professional collaboration serves as the main vehicle for sharing the enormous "translation" burden of the pedagogy of mathematics for students with visual impairments. The "co-pilot" model defines an arrangement of partnership between a mathematics teacher and a certified teacher of the visually impaired (TVI) that allows each professional to utilize his or her areas of greatest over. As Teacher G saw it, this division of labor allows the mathematics teacher to focus on content ("the what") while the TVI takes care of accessibility ("the how"). This relational dynamic increases efficacy through vicarious experience and social persuasion as teachers are observing and receiving information about successful adaptation. In the lack of formal structures, educators rely on informal networks consisting of peers. Teacher H identified these grassroots "lifelines" as being very important for emotional support and quick problem-solving. Even so, the study also reveals the risks of the "island of expertise" model, in which one highly qualified individual always bore the full responsibility of meeting the needs of the entire district- in this case, Teacher B. This "island" model is not sustainable and creates a systemic single point of failure. True institutional capacity is not built through isolated experts nor is it built in an ad-hoc manner but rather through systems of knowledge transfer such as structured mentorship and co-teaching that diffuse specialized skills throughout the wider teaching workforce.

Institutional Scaffolding: Leadership, Budgets, and Time

Teacher efficacy is not just an individual characteristic but one that results from "institutional scaffolding," which encompasses the administrative support, budgets and time given by the district. Administrative leadership as critical facilitator or gatekeeper teacher examples: Teacher c's "annual battle" for a braille embosser reflects how resource denial sends a devaluing message that compromises a teacher's confidence in his or her ability to bring about change. This institutional failure is often the result of "unfunded mandates." As Teacher J observed, policy-level imperatives that demand inclusion with no simultaneous funding for or training cannot mean "hands tied" for administrators, and "holding the bag" for teachers. The most neglected resource is time; the lack of dedicated preparation time for material adaptation causes accessibility to become an optional extra add-on. This lack of time is or constitutes one of the main causes of the stress that forces teachers to choose between their own personal health and quality of student instruction.

A direct causal chain exists whereby unfunded mandates lead to resource scarcity and lack of specialist support leading to teachers having to tread the demoralizing "trial-and-error" pathway. As a result of this, there arise negative mastery experiences in conjunction with a compromised affective state. Addressing self-efficacy, therefore, requires system-level interventions at the policy and funding levels to help create a supportive environment.

The "human element" functions as the driving engine of motivation, which is a direct-to-Bandura's fourth source of efficacy: physiological and affective states. Teachers exist in a constant struggle between the debilitating burden of being "completely overwhelmed" and the internal and intrinsic reward of "aha" moments in students. While chronic systemic pressure predisposes burnout and task avoidance as a

professional, witnessing the notoriety of student success is a catalyst for efficacy engaged in maintaining the capacity for resilience needed to perform in this high-stakes role.

The Weight of the Work: The Affective Cost of a High-Stakes Role

Participants repeatedly identified a high-level affective condition that was characterized by the perception of being "completely overwhelmed." This sentiment, expressed by Teacher F, a relatively inexperienced instructor working in a low resource context, goes beyond normal operational stress. Within the scope of the self-efficacy theory, such an affective experience is a powerful cognitive and emotional message developing when instructors feel that the demands of the task of adapting complex mathematics instruction, in the absence of adequate training, time and material support, are far greater than their perceived ability to meet those demands.

The experience of overwhelm forms the aggregate consequence of the priorly delineated systematic deficiencies. It is amplified by the big cognitive load which comes with the "translation" burden, the stigma of operating as an isolated expert, the frustration involved in the struggle for basic resources, and the acute paucity of time. In this state, the creative problem-solving ability and perseverance of instructors is significantly impaired by adversity. Consequently, task avoidance behaviors such as oversimplifying its curriculum for avoiding difficult adaptations, using suboptimal teaching strategies, or delaying the development of materials may be observed. Although these strategies for avoidance may seem like rational coping strategies, they ultimately hurt the student and can lead to a negative feedback loop where the teacher is avoiding a demanding task because he/she feels overwhelmed, student learning is adversely affected because of this, and that student's perceived failure leads back to teacher's lack of efficacy and feeling overwhelmed.

Chronic experience of this affective state is a pathway directly leading to professional burnout that depletion of the emotional and motivational reserves necessary to sustain such engagement in this demanding occupation over time. Accordingly, reducing the factors leading to such an overwhelmed state is a major goal for any intervention aimed at maintaining an effective and inclusive teaching workforce.

The Fuel of the Work: Intrinsic Rewards as an Efficacy Catalyst

While the pressures from the system often create a feeling of being "overwhelmed", the inherent rewards are an important counterweight and necessary fuel for teacher resilience. The "aha" moment that the student realizes, representing the moment of conceptual breakthrough, serves as the ultimate positive feedback and a multifaceted reinforcer in the context of the self-efficacy theory. First, it is a powerful mastery moment, providing concrete, indisputable evidence that the specialized touch graphics or painstaking explanations that the teacher has developed have succeeded in attaining the specified learning objective. This success significantly confirms the teacher's belief in his or her own competence. Second, such breakthroughs bring about a positive affective state; the "best feeling in the world" articulated by Teacher Destra F is a professional antidote to stress to replenish motivational reserves and to eclipse recollections of previous adversities.

This dynamic determines what may be referred to as an "Efficacy-Motivation-Efficacy Loop." When an intensive effort from the teacher results in the student breakthrough, it then directly contributes to self-efficacy, creating a renewed willingness to accept further challenges enroute. The loop suggests that the emotional trajectory of the teacher is not marginal but is a central mechanism of professional efficacy.

To keep an inclusive practice alive in Punjab Special Education System, it is important that the work

environment is architected deliberately to enhance a higher frequency of these successes. By ensuring that these "aha" moments are an expression of structured, specialized skill, not exhaustive, heroic effort, the right training, right tools and right amount of time can ensure the high effectiveness of practice is self-sustaining.

DISCUSSION

The results of the present phenomenological question have a critical look in the landscape of mathematics education to the Punjab Special Education System. By analyzing the lived experiences of Teachers of the Visually Impaired (TVI), the study shows that teacher self-efficacy is a dynamic construct, as opposed to a static construct, being deeply informed by the four sources that Bandura identified, namely mastery experiences, vicarious experiences, social persuasion, and affective states.

A common theme that stands out from the data is the strong contrast between the "Trial -and-Error" Pathway and the "Specialist" Pathway. Teachers who enter the classroom without STEM-specific training faced what they call a 'precipice,' in which the technique of instructional design is taking the form of a survival endeavor and not a scholarly pursuit. This improvisational way is inefficient and leads to a "downward spiral" in efficacy; with more instructional failures, teachers accumulate negative mastery experiences that serve to consolidate a "survivalist" professional identity. Conversely, those on the Specialist Pathway who have fluency in the Nemeth Code and tactile design get a "first-order effect" of immediate competence. This proactive base enables early successes to serve as an efficacy multiplier which changes the teacher from a passive recipient of systemic challenges into an active agent of inclusion (Sisk, 2022; Tight, 2022; Aftab et al., 2025).

The study identifies a pronounced "Implementation Gap" in which the availability of resources - whether low -tech or high - tech - fails to assure the quality of instruction. This gap reveals a lack of knowledge in Pedagogical Content Knowledge (PCK), which is specialized knowledge in imparting mathematics without relying on images. Teachers operating in Punjab do not just transmit content, they do a high stake and real-time "act of translation." Transforming abstract visual concepts such as quadratic functions into something that is tactile or aural amounts to a heavy cognitive load. When instructors are deficient in the PCK necessary for them to translate efficiently, there is an "affective cost" which manifests in the form of complete overwhelm. Consequently, efficacy in this context is reconceptualized as the teacher's self-assurance in carrying out the role of an accurate and fast "translator" of mathematical symbols and space concepts (Sagar et al., 2021; Pirzado, 2022; Aftab et al., 2024).

Furthermore, the research highlights the fact that self-efficacy is crucially influenced by the "Institutional Scaffolding" offered by school leadership and school policy. The "co-pilot" model of collaboration between mathematics teachers and technical-visual instructors then becomes an important lifeline, sharing cognitive load, forming vicarious experiences that build confidence. Nevertheless, the existence of "unfunded mandates" and the model of "island of expertise" (in which one expert is responsible for one entire school district) creates a weak system that is vulnerable to failure. When roles of administrators involve taking on heavy lifting of gatekeeping instead of facilitating roles, and when allotted preparation time is viewed as an optional luxury item, the system is in effect devaluing adaptive work, which results in professional burnout (Naseem et al., 2024; Hidayatullah et al., 2024; Triana- Vera & Lopez- Vargas, 2025).

Despite these systemic impediments, the "Human Element" is a powerful catalyst in resilience through the inherent rewards. The "aha" moment experienced by the student is the ultimate positive feedback loop. These are breakthroughs that provide irrefutable documentation of teachers' effectiveness (mastery experiences) as well as create a positive affective state that restores motivational reserves. This "Efficacy-

*Motivation-*Efficacy Loop" suggests that the emotional trajectory of the teacher is one constituent mechanism of professional efficacy. To move further, the Punjab Special Education System needs to move beyond theoretical seminars and build an atmosphere through specialized training, suitable tools and allocated time, where the even seconds of success are a predictable occurrence of specialized skills and not a heroic and draining endeavour (Silk, 2021; Tenschert et al., 2025; Jaleel et al., 2025).

CONCLUSION

The analysis of the Punjab Special Education System has shown that the self-efficacy of mathematics teachers is a crucial factor in the determination of the quality of instruction given to the pupils who have visual impairment. Empirical data has shown a significant "confidence gap" where higher levels of academic qualifications, for example, M.Phil., do not necessarily translate into greater instructional efficacy. Rather, the most salient predictor of confidence is direct, domain-specific experience. This finding implies that the system in place puts disproportionate emphasis on theoretical knowledge to the cost of practical mastery. Consequently, to resolve this discrepancy, some reorganization of the professional development structure is in order, one that emphasizes the experiential development of pedagogical expertise and assures that teachers are not simply credentialed on paper but are properly prepared to connect complex STEM concepts for visually impaired learners.

RECOMMENDATIONS

Following recommendations are made based on findings:

1. Move away from generalist, theory-based seminars toward practical workshops. These sessions should focus on the direct creation of tactile graphics, the programming of assistive technology, and the verbal description of visual concepts to build immediate instructional mastery.
2. Higher education programs in Special Education should be audited to better integrate STEM-specific instruction. Mandatory, credit-bearing practicums should be embedded into M.A. and M.Phil. programs, requiring students to implement adapted lesson plans and receive structured feedback before entering the workforce.
3. Utilize the "untapped potential" of veteran educators by pairing novice teachers with experienced mentors. This institutionalizes the transfer of tacit, practice-based knowledge that the research shows are essential for building professional self-efficacy.
4. School administrators should move away from the assumption that any experienced teacher can teach SVI mathematics. District officers should prioritize the placement of teachers with specific training in this area and ensure that any novice placed in these roles receives an immediate support package of resources and mentorship.
5. All systemic interventions from hiring to mid-career training should be designed around Mastery Experiences. By providing teachers with small, early successes in adapting assessments and tools, the system can systematically build the collective confidence of the teaching force.

REFERENCES

Aftab, M. J., Bano, S., & Iram, U. (2024). Challenges encountered by Students With Visual Impairment in Accessing Orientation and Mobility Training. *Annals of Human and Social Sciences*, *5*(2), 514-523.

Aftab, M. J., Bibi, I., & Amjad, F. (2024). ROLE OF ASSISTIVE TECHNOLOGY IN THE REHABILITATION OF CHILDREN WITH VISUAL IMPAIRMENT. *International Journal of Social Sciences Bulletin*, *2*(4), 1200-1207.

Aftab, M. J., Sajjad, R., & Amjad, F. (2025). Augmenting Tertiary-Level Scholastic Outcomes for Visually Impaired Learners via Advanced ICT Modalities. *ASSAJ*, *3*(02), 2387-2402.

Ahmad, B., Majeed, Z., & Basit, A. (2024). Investigating Differentiated Instructions for Students with Visual Impairment on Teaching of Maths. *Pakistan Social Sciences Review*, *8*(3), 800-812.

Ali, C. A. (2021). Visually Impaired Student-Teachers' Knowledge and Use of Basic Assistive Technology Tools for Mathematics. *African Educational Research Journal*, *9*(4), 945-955.

Alotaibi, F. A. M., & Youssef, N. H. A. (2023). Knowledge of Mathematics Content and its Relation to the Mathematical pedagogical content knowledge for Secondary School Teachers. *Pakistan Journal of Life & Social Sciences*, *21*(1).

Cabral-Gouveia, C., Menezes, I., & Neves, T. (2023, May). Educational strategies to reduce the achievement gap: a systematic review. In *Frontiers in education* (Vol. 8, p. 1155741). Frontiers Media SA.

Daniel, J. (2025). The academic achievement gap between students with and without special educational needs and disabilities. *European Journal of Special Needs Education*, *40*(3), 539-556.

Hanif, S., Fatima, G., & Jahanzaib, M. (2024). Analysis of Expanded Core Curriculum (ECC) for Learners with Visual Impairment at Primary Schools: A SWOT Analysis. *Pakistan Social Sciences Review*, *8*(3), 54-65.

Hidayatullah, A., Csíkos, C., & Setiyawan, R. (2024). The role of belief sources in promoting goal orientation beliefs, self-efficacy, and beliefs about the role of teachers in mathematics learning. *The Asia-Pacific Education Researcher*, *33*(6), 1383-1393.

Hussain, F., Hameed, A., & Ashraf, T. (2022). Accessibility hurdles in inclusive education of the visually challenged students at university level in Pakistan. *Pakistan Social Sciences Review*, *6*(2), 458-467.

Iqbal, M. Z., Noor, H., Nadeem, M. H., Javed, T., & Shams, J. (2020). Problems in learning of mathematics: a case of visually impaired students. *Ilkogretim Online-Elementary Education Online*, *19*(4), 5100-5106.

Jaleel, F., Ahmad, K., & Amjad, F. (2025). Environmental Factors Affecting Sustainable Employment of Persons with Visual Impairment: A Qualitative Approach. *Policy Journal of Social Science Review*, *3*(7), 431-466.

Khan, Z., & Seelro, S. (2025). Integrating Iqbal's Concept of Sensory Perception and Intuition in Contemporary Pakistani University Classrooms. *Payam-i-Iqbal Bahria Research Journal on Iqbal Studies*, *4*(2), 1-15.

Malik, S., & Khan, S. I. (2022). Role of Implementing Strategies of Expanded Core Curriculum for Effective Orientation and Mobility Practices from Perspectives of Parents and Teachers of Visually Impaired Leaners in Pakistan. *Research Journal of Social Sciences and Economics Review*, *3*(3), 1-9.

Maqbool, A., & Ashraf, S. (2023). Teaching Mathematics to Students with Visual Impairment Studying at the Primary Level: Role of Multisensory Approach. *Sustainable Business and Society in Emerging*

Economies, *5*(3), 225-238.

Mishal, A., Naseem, A., Zahid, H., & Naseer, I. (2024). Relationship between Teacher's Sense of Self-Efficacy and Teaching Experience. *Journal of Asian Development Studies*, *13*(3), 1530-1537.

Mughal, S. H., Asad, M. M., & Adams, D. (2020). Goals of the national mathematics curriculum of Pakistan: educators' perceptions and challenges toward achievement. *International Journal of Educational Management*, *35*(1), 159-172.

Nahar, L., Sulaiman, R., & Jaafar, A. (2022). An interactive math braille learning application to assist blind students in Bangladesh. *Assistive Technology*, *34*(2), 157-169.

Naqvi, S. B. A. (2024). RELATIONSHIP BETWEEN TEACHERS'SELF-EFFICACY AND ACADEMIC ACHIEVEMENTS OF STUDENTS AT SECONDARY LEVEL IN DISTRICT MUZAFFARABAD. *ACADEMIA International Journal for Social Sciences*, *3*(1), 1-13.

Naseem, A., Saeed, S., & Akbar, G. (2024). Effect of Perceived Social Support on Self-Efficacy of Secondary School Teachers. *Pakistan Languages and Humanities Review*, *8*(1), 184-194.

Parveen, Z., Naqvi, B. A., Abbas, A., & Zahid, M. (2023). The role of integrating technology in teaching numeric skills to children with visual impairment in Gujranwala, Punjab, Pakistan. *Journal of Humanities, Social and Management Sciences (JHSMS)*, *4*(1), 225-235.

Pirzado, P. A. (2022). *Teachers' understandings and practices in teaching human rights concepts in Pakistani schools*. University of Technology Sydney (Australia).

Rafiq, H., Aziz, S., & Shahzadi, I. (2024). Exploring the Effectiveness of Fleming's Multi-Sensory Visual, Auditory Kinesthetic Technique to Teach Vocabulary at Primary Level. *Pakistan Languages and Humanities Review*, *8*(3), 101-112.

Sagar, M. G. D., Gaikwad, M. N., & Kakade, G. K. (2021). Impact of ICT in Teaching, Learning and Evaluation Process. *Harshwardhan Publication Pvt. Ltd. Limbaganesh, India*.

Silk, M. C. (2021). *The Value of Me in STEAM: Teacher identity development through STEAM education*. University of Technology Sydney (Australia).

Sisk, D. (2022). *Gifted education, creativity and leadership development* (p. 148). MDPI-Multidisciplinary Digital Publishing Institute.

Tenschert, J., Furtner, M., & Peters, M. (2025). The effects of self-leadership and mindfulness training on leadership development: a systematic review. *Management Review Quarterly*, *75*(4), 2811-2862.

Tight, M. (2022). Internationalisation of higher education beyond the West: challenges and opportunities–the research evidence. *Educational Research and Evaluation*, *27*(3-4), 239-259.

Triana-Vera, S., & López-Vargas, O. (2025). Academic Self-Efficacy, Online Self-Efficacy, and Fixed and Faded Scaffolding in Computer-Based Learning Environments. *Contemporary Educational Technology*, *17*(1).