

The Effect of Teacher-Led School Aims and Objectives on Teacher Problem-Solving Skills in Ghana

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ABSTRACT

This study investigates the impact of teacher-led school aims and objectives on teachers' problem-solving skills in Ghana, focusing on the mediating role of teacher-driven school objectives. Utilizing a quantitative research approach, data were collected from a sample of teachers across multiple schools. The findings reveal that teacher-led school objectives significantly influence teacher problem-solving abilities. However, teacher-led school aims showed otherwise. Additionally, teacher-led school objectives mediate the relationship between teacher-led school aims and teachers' problem-solving skills in Ghana. This study provides new evidence highlighting how structured educational goals and objectives can mediate the relationship between school aims and teacher problem-solving abilities. This study contributes to the growing body of literature on educational leadership and its effect on teacher problem-solving skills, offering practical implications for policy-makers and educators seeking to enhance critical thinking and problem-solving skills through goal-setting initiatives in schools.

Keywords: Teacher-led objectives, School aims, School objectives, Teachers' Problem-solving skills, Ghanaian education.

INTRODUCTION

People tend to encounter problems in their environment thereby pushing them to look for solutions (Babalola, 2014). In line with Babalola's assertion people are more inclined to set aims, goals and objectives to resolve the problems encountered. Preparing students to tackle complex challenges is essential in today's education landscape. Problem-solving skills encompass critical thinking, creativity, and the ability to navigate obstacles, which are crucial for academic success and future career success (Szabo et al., 2020). These skills enable both teachers and students to analyze problems, devise innovative solutions, and adapt to changing environments (Mahmud & Wong, 2022), where teachers were the focus of the present study.

Problem-solving skills refer to one's ability to identify, analyze, and develop solutions to various challenges or issues encountered in academic, personal, or real-world contexts (Szabo et al., 2020). These skills involve critical thinking, creativity, collaboration, and perseverance. According to Nguyen et al. (2021) and Do et al. (2022), problem-solving skills include individuals' cognitive and behavioral processes to address problems or obstacles effectively. Furthermore, the significance of problem-solving skills transcends geographical boundaries and is recognized as essential for success in the 21st-century workforce (Atkinson, 2024). In an era characterized by rapid technological advancement and global challenges, individuals who excel at problem-solving are better equipped to navigate ambiguity, overcome obstacles, and drive innovation. Teachers worldwide seek to develop people who can adapt to change, think critically, and propose creative solutions to complex problems (Yu, 2023; Tan, 2021). Formulation of aims, goals and objectives as a result

from the problem encountered and the desire to solve such problems to improve the structure of the system (Babalola, 2014, p. 810). Proffering solutions should be part of a teacher's aims, goals and objectives.

The impact of teacher-led school aims and objectives on teachers' problem-solving abilities remains underexplored. Teachers are pivotal in shaping the educational environment by establishing clear aims and objectives. These goals guide daily instruction and influence the learning atmosphere (Leithwood et al., 2020). However, there is limited empirical evidence on how teacher-set aims and objectives affect teachers' problem-solving skills and the specific mechanisms through which these impacts are achieved.

Research indicates that instructional leaders who foster a positive learning climate and set high expectations can significantly influence students' problem-solving capabilities (Thien et al., 2023) and this present study sought to explore how similar mechanism affects teacher problem-solving capabilities. In Ghana, where educational challenges include limited resources and a focus on rote learning, instructional leadership becomes even more critical (Donkoh et al., 2023); teachers' ability to set effective educational aims is essential for bridging the gap between broad educational goals and developing problem-solving skills. Despite this, the precise role of teacher-led objectives in mediating the relationship between aims and teacher problem solving skills has not been thoroughly investigated.

This study addresses this gap by examining how teacher-led school aims and objectives influence teachers' problem-solving skills, focusing on the mediating role of teacher-led objectives. By exploring this relationship, we sought to provide insights into how teacher-led school aims and objectives can better support the development of problem-solving skills among teachers in the modern and disruptive learning environment.

Research Objectives:

1. To examine the effect of teacher-led developed school aims on teacher problem-solving skills.
2. To examine the effect of teacher-led developed school objectives on teacher problem-solving skills.
3. To examine the effect of teacher-led developed school aims on teacher-led developed school objectives.
4. To investigate the mediating role of teacher-led school objectives on the relationship between developed school aims and teacher problem-solving skills.

Research Questions:

1. Are teacher-led developed school aims significant predictors of teacher problem-solving skills?
2. Are teacher-led developed school objectives significant predictors of teacher problem-solving skills?
3. Are teacher-led developed school aims significant predictors of teacher-led developed school objectives?
4. How significant is the mediating effect of teacher-led school objectives on the relationship between developed school aims and teacher problem-solving skills?

Significance of the study

This study extends *the Creative Problem-Solving Theory* (CPS) by exploring its application within the context of educational leadership. It enhances understanding of how teacher-led school aims and objectives influence teacher problem-solving skills, providing new insights into the theories and practical implications. Additionally, integrating *Goal-Setting Theory* (Locke & Latham, 2013) into the creative problem-solving framework helps elucidate how broad aims and specific challenging objectives set by teachers can drive improved problem-solving. Empirically, this research addresses significant gaps in the literature by investigating how teacher-developed school aims and objectives affect teachers' problem-solving skills. Prior studies have primarily overlooked the direct impact of these teacher-led elements on teachers' problem-solving skills. This study provides new evidence from Ghana, highlighting how structured educational goals and objectives can mediate the relationship between school aims and teacher problem-solving abilities. The

findings offer valuable data for educational leaders and policymakers aiming to enhance teacher outcomes through targeted goal-setting and instructional strategies as all the sectors of work-life are experiencing disruption in an era of the fourth industrial revolution.

LITERATURE REVIEW

Goal-Setting Theory: Locke (1968) developed a goal-setting theory with a focus on how setting specific and challenging goals affect performance. Edwin Locke working with Gary Latham expanded the theory, emphasizing the role of goal specificity, difficulty, and feedback in enhancing performance (Locke & Latham, 2013). Goals influence behavior by directing attention and effort toward goal-relevant activities. Specific and challenging goals lead to higher performance than vague or easy goals. Feedback is essential for goal achievement as it helps individuals gauge their progress and adjust their strategies. The theory has been critiqued for its applicability across different contexts, particularly in dynamic environments where goals might need frequent adjustments (Locke & Latham, 2002). Locke and Latham (2002) argue that specific and challenging goals are more effective because they create a sense of purpose and urgency. Other researchers emphasize the importance of goal commitment and self-efficacy in achieving set goals (Bandura, 1997).

Goal-setting theory is crucial in understanding how clear and challenging objectives can enhance performance and motivation (Locke & Latham, 2002). It provides a framework for setting effective goals that align with desired outcomes. The Goal-Setting Theory is relevant to our study as it can explain how setting specific and challenging goals influences problem-solving skills and academic performance. By incorporating this theory, we can explore how goal-setting impacts teachers' abilities to tackle complex tasks and achieve better results: solving problems. The theory underpins the study by providing a basis for investigating how goal setting impacts problem-solving processes within the educational setting. Exploring the aims-goals-objectives tripod will elucidate our understanding of clear, challenging aims, goals and objectives in enhancing teachers' problem-solving abilities in schools.

Creative Problem Solving (CPS) Theory: Alex Osborn and Sidney J. Parnes developed the Creative Problem Solving (CPS) Theory in the 1950s through to the 1960s. The theory focuses on structured approaches to enhance creativity and problem-solving skills. It evolved from initial studies on cognitive processes in solving abstract problems to a more comprehensive framework applicable to various real-world scenarios (Newell et al., 1958). The work of Cho (2003) modified the works of creativity theorists which led her to propose the Dynamic System Model of Creative Problem-Solving Ability where motivation, convergent thinking, and divergent thinking were argued to function as tools that make use of general as well as domain-specific knowledge and skills to resolve problems under an appropriate environmental condition in a new and useful fashion. Creative Problem-Solving Theory is significant for fostering innovative thinking and structured problem-solving. It provides a methodology for tackling complex issues through creativity and systematic processes. The Creative Problem-Solving Theory is relevant to this study as it offers a structured approach to enhancing problem-solving skills and creativity. It aligns with the study's objective of improving teachers' ability to tackle problems effectively. Creative Problem-Solving Theory contributes to understanding creative processes and problem-solving techniques. It is widely used in educational and organizational contexts to improve problem-solving and innovative thinking. Creative Problem-Solving Theory underpins the study by providing a framework for exploring how problem-solving impacted teachers' aims, goals and objectives.

Conceptual Review:

Teachers' Led School Aims and Teacher Problem-Solving Skills: Teachers' involvement in setting school aims has been recognized as essential for enhancing teacher problem-solving skills. According to Piaget's Constructivist Theory (1970), learning is an active process where students build knowledge through experience. By extension teachers build knowledge through experience. Teachers who lead in defining clear and specific educational aims help create an environment that fosters critical thinking and problem-solving. By aligning school objectives with student development, teachers can ensure that students are engaged in tasks that challenge them to develop and apply problem-solving strategies. The teachers would be actively involved

in the development and application of the problem-solving strategic skills. This motivated the need to understand teacher problem-solving strategies within the boundaries of the school system.

Vygotsky's (1978) Social Development Theory suggests that students learn more effectively in environments guided by teachers or peers. Teachers' involvement in goal setting provides this guidance, particularly through scaffolding problem-solving tasks that challenge students to think critically. When school aims are teacher-driven, the focus is often on creating opportunities where students can collaboratively and independently tackle complex problems, enhancing their problem-solving abilities. How do these teacher driven aims project the problem-solving abilities of the teachers as they provide guidance to their students? The focus of the study is to understand the problem-solving abilities of teachers who are key to the development of students' problem-solving.

Teacher-Led School Objectives and Teacher Problem-Solving Skills: Teacher-led school objectives significantly impact student problem-solving skills by shaping a learning environment that fosters critical thinking. According to Piaget's (1970) Constructivist Theory, students learn effectively when actively engage in their learning process. Teachers who set school objectives aligned with student needs create opportunities for students to tackle complex problems, enhancing their problem-solving abilities (Piaget, 1970). What is the relevance of teachers problem-solving skills in the school environment if they are not inclined to set aims, goals and objectives to resolve the natural and man-made problems encountered within their environment (Babalola, 2014)?

Vygotsky's (1978) Social Development Theory highlights that cognitive development is enhanced when an individual interacts with knowledgeable others, such as teachers. When teachers lead in establishing school objectives, they provide structured support that helps students develop problem-solving skills through guided activities and collaborative learning (Vygotsky, 1978). There is a need to understand the teacher's problem-solving skills within the guided activities and collaborative learning of the students.

Research shows that teacher participation in defining school objectives is crucial for improving students' problem-solving abilities (Özpinar & Arslan, 2023). According to Lin and Cho (2012) all attributes of creative problem solving are equally important and these attributes must all be developed to a certain level for an individual to perform creative problem-solving when it comes to nurturing and development of creative problem-solving attributes. Undoubtedly, in school, teachers greatly affect their students' problem solving process (Özpinar & Arslan, 2023). This suggests that teacher involvement in setting objectives helps create a learning environment emphasizing critical thinking and effective problem-solving. The present study focused on the developed and nurtured level of creative problem solving of teachers as they create the learning environment emphasizing their students' critical thinking and effective problem solving.

Teacher Problem-Solving Skills: Student problem-solving skills are crucial for academic success and real-world application. Problem-solving involves identifying, analyzing, and addressing challenges effectively. Fostering problem-solving skills in educational settings involves creating learning environments that encourage exploration, critical thinking, and application of knowledge. For instance, Gick and Holyoak (1983) demonstrated that students' problem-solving abilities improve when they engage in tasks that require transferring knowledge from one context to another. This approach helps students develop flexibility in their thinking and apply problem-solving strategies across various situations.

Zimmerman (2002) emphasizes the role of self-regulation in problem-solving. Effective problem solvers are often characterized by their ability to set goals, monitor their progress, and adapt their strategies. This adaptability reassures educators and researchers that problem-solving strategies are not rigid but can be tailored to different situations, enhancing students' ability to handle complex problems effectively. Hukamdad, Akhter and Khan (2010) identified a significant difference between the effectiveness of traditional teaching method and problem solving method in teaching of mathematics at elementary school level. This led the researchers to recommend that teachers should be encouraged to employ problem solving method in teaching mathematics concepts, which could be achieved through regular training, workshops and seminars for teachers

with the hope of enhancing their knowledge and understanding of problem based learning (Hukamdad et al., 2010). The teacher cannot teach what he lacks therefore, understanding the teachers' problem-solving capabilities within the educational context is not farfetched.

Conceptual Framework:

The conceptual framework, a comprehensive and well-structured tool, integrates key variables to provide a structured approach to understanding the impact of teacher-led school aims and objectives on teachers' problem-solving skills. The independent variable is teacher-led school aims, and the dependent variable is teachers' problem-solving skills. The mediating variable is teacher-led school objectives. Figure 1 shows diagrammatic outline of the conceptual framework, providing a clear and structured overview of the research variables.

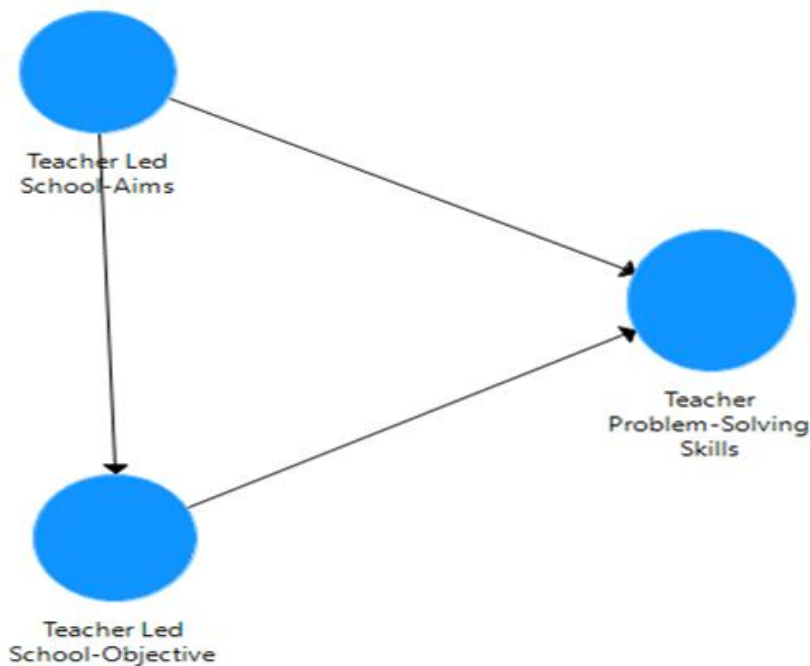


Figure 1: Teacher Aim-Objective-Problem-Solving Conceptual Framework diagram

Sources: Authors Own conceptual framework, 2024

Empirical Related Studies

Teachers as Problem Solvers: General problem solving skill is argued by Glaser (1987) and Tsui (2003) to be an important part of expert teachers' proficiencies. Furthermore, Orgoványi-Gajdos (2016) noted that teachers were projected as persons who respond to all of the challenges they encounter in their daily professional works by employing problem solving as a key feature in their teaching profession. Teachers according to Calderhead (1989) as well as Silverman and Welty (1990) must deal with practical problems which require that they deliberate and take action to find solutions while dealing constructively with change, such as incessant digital disruption.

Previous researchers, such as, de Bono (1985) and Isaksen and Treffinger (2004) have argued that problem solving skill links knowledge and action, declarative and procedural knowledge, and includes creative, lateral and critical thinking processes, as well as systems thinking. Within this context, Orgoványi-Gajdos (2016) argued that a given problem-solving skill is interlinked with all the key teacher and teaching competences which cuts across curricular. The present authors see teachers' problem-solving as one of the indispensable high-level professional skills teachers need to be able to frame, reframe and resolve all the challenges they face as they set their goals to work on them in order to achieve their objectives on the job.

Teacher-Led School Aims and Its Impact on Teacher Problem-Solving Skills:

Noddings (2007) noted that aims, goals, and objectives can be thought of as hierarchically ordered educational purposes. Aims, according to Noddings, remind people of their ideals and directly influence how individuals construct their goals and objectives. Tentatively there is always the need to discuss aims when teachers set out to accomplish their teaching and learning activities in schools. One of such teaching and learning activities is problem-solving. Every element of the teaching profession is permeated by problem solving and the success of the pedagogical problem-solving process is implicit in the teacher's teaching and learning activities. This depends on the teacher's ability to combine different knowledges, different skills and motivational factors (Orgoványi-Gajdos, 2016) underpinned by the aim of the teacher. Noddings asserted that in discussing educational aims, stakeholders should analyze not only the curriculum but all of the activities sponsored by schools. One of such sponsored activities is the teacher's problem-solving activities.

Studies in the literature indicate that variables such as age, class, gender, and student's academic success affect students' mathematical problem-solving success (Bunar, 2011; Güven & Çabakçor, 2013; Özgen et al., 2017; Özsoy, 2005). Most of these studies focused either on the methods used for measuring and evaluating students' problem-solving skills or on identifying the behavior students exhibit during the problem-solving process (Peranginangin & Surya, 2017; Rahmawati et al., 2020). Özpınar and Arslan (2023) in their study used teachers to evaluate the behaviours of students against the problems solving processes in the classroom environment. A teacher's problem-solving skill is interlinked with all the key teacher and teaching competences which cuts across curricular (Orgoványi-Gajdos, 2016). The implication is that the teacher is expected not to only identify problems but have the competencies to evaluate problem-solving behaviours and in line with Noddings' (2007) position these teacher activities should be discussed as part of the educational aims.

The teacher's problem-solving skills and associated antecedents need to be examined since they are indispensable high-level professional skill used in the school setting (Orgoványi-Gajdos, 2016). However, detailed studies on how specific Ghanaian teacher-led aims directly motivate or translate into enhanced problem-solving skills across diverse Ghanaian educational settings are lacking. This gap in research is a pressing issue, as it hinders our understanding of the long-term impact of teacher-led school aims on problem-solving skills, for the teacher as an individual, and beyond immediate academic outcomes. Based on the review, we hypothesize that:

Hypothesis: H1: Teacher-led developed school aims positively and significantly influence teacher's problem-solving skills.

Teacher-Led School Objectives and Problem-Solving Skills

Noddings (2007, p. 10) argued that 'all teachers should consider what they can do to advance the school's general aims' and '... formulate goals compatible with more general aims... to encourage cooperative problem solving' (p.11). Indeed, Burns et al. (2018) found that students who experience more positive social-emotional support from teachers, parents, and peers are more likely to utilize growth goal-setting. Whereas there exists the suggestion that the entire structure of aims for 21st century education should be analyzed and revised, most teachers are not prepared to think productively along these lines (Noddings, 2007). Noddings further noted that heads of educational institutions tend to encourage or command teachers to have a learning objective for every lesson. Research shows that teacher participation in defining school objectives is crucial for improving students' problem-solving abilities. For instance, the interview data of Forneris, Danish and Scott (2007) demonstrated that the adolescents in a GOAL project learned how to set goals, develop strategies to solve problems effectively and seek the appropriate type of social support. Undoubtedly, in school, teachers greatly affect their students' problem-solving process (Özpınar, & Arslan, 2023) where a clear, achievable objectives set by teachers is presumed to enhance student problem-solving skills. Teachers may pose questions about the values in solving problems and the logical rationale behind problem-solver's actions (Gökkurt et al., 2015). This brings to the fore the role of the individual teacher's problem-solving skills and abilities.

Nurhayanti, Riyadi, and Usodo (2020) stated that each individual's inherent ability is different when solving problems. Problem-solving as a predictor of school outcome have been reported among head teachers of Ghana's basic educational institutions (Semarco, 2017; Semarco, 2018). The head teachers who participated in the studies have served as classroom teachers prior to their headship roles. Semarco and Cho (2018) also found that headteachers who harnessed their problem-solving managerial behaviour to creatively fit teachers to schools were associated with positive teacher retention intentions. Semarco and colleagues (2017, 2018) did not examine teacher problem solving within the context of school aims and objectives. Schunk (2009) clarifies that goal setting has the potential to positively impact learning in schools. Examining teachers' problem-solving behaviours within the context of school aim, goal and objective's setting is not implausible. By extension, how will teachers' objectives impact their problem-solving skills which had been argued by Orgoványi-Gajdos (2016) to be interlinked with all the key teacher and teaching competences. Based on this review, we hypothesize that:

Hypothesis: H2: Teacher-led developed school objectives positively and significantly influence teachers' problem-solving skills.

Teacher-Led School Aims and School Objectives and Problem-Solving Skills

The aims, goals and objectives must be constantly evaluated to discover whether the school is making an impact on society (Babalola, 2014). How should teachers think about a school's objective? Ideally, teachers should think first about how the objective fits with larger goals and aims; then they should do a task analysis and identify the skills required to achieve the objective (Noddings, 2007). Babalola (2014) noted that goal is more definite than aim and that objective is also more definite than goal. In other words, aims, goals and objectives differ but 'congruence must be well established for a balanced development of the society' (p.810). Fundamentally researchers like Babalola (2014) have argued that objectives tend to translate the goal of an institution into concrete action through well-coordinated programmes of activities, such as the teacher's problem-solving actions.

Teacher-led school objectives that mediate broader school aims are expected to significantly enhance problem-solving skills for both teachers and students. This alignment ensures that problem-solving is integrated into various learning activities. Özpınar and Arslan (2023) noted that teacher-led objective-setting and regular feedback improved problem-solving outcomes. Existing studies have not thoroughly explored how teacher-led school objectives mediate alignment with teachers-led school aims, affecting problem-solving in general and specific teacher's problem-solving skills. Introducing this mediation fills a critical gap, offering a better understanding of the dynamics at play. Teachers who lead in defining clear and specific educational aims and school objectives help create an environment that fosters critical thinking and problem-solving, a crucial factor for improving students' problem-solving abilities (Özpınar & Arslan, 2023). The present study focused on exploring the mediating effect of teacher lead objectives on the linkage between the teacher's aims and his/her problem-solving skills. In other words, there is a need for more research on how the mediation of teachers-led school objectives influences teachers-led school aims and teachers' problem-solving skills in diverse contexts. Based on this review, we hypothesize that:

Hypothesis: H3: Teacher-led school aims significantly related with teacher-led school objectives.

Hypothesis: H4: Teacher-led school objectives significantly mediate the relationship between developed school aims and problem-solving skills among teachers.

METHODOLOGY

Research Philosophy and Design: This study used post-positivism paradigm. Post-positivism is justified because it allows for a more nuanced understanding of the relationship between teacher-led 'aims-goals' and teacher problem-solving skills, considering the complexities and contextual factors associated with objectives where goals get translated into action. The researchers employed a cross-sectional research design to collect

data from diverse participants simultaneously (Bell et al., 2022). This design facilitates the simultaneous collection of information on teacher-led school aims, objectives, and teacher problem-solving skills. An explanatory design was also used to explore the cause-effect relationships and outcomes associated with teacher-led school aims, objectives, and teacher problem-solving skills.

Research Approach: The present investigation utilized quantitative research. According to Mahajan (2020), quantitative research involves achieving a study's objectives through objective measurements and using numerical data analyzed through statistical methods.

Research Population and Target Sample: For this study, the population is the entire group of form masters and mistresses across all senior high schools in Ghana. This represents the broad group from which data could potentially be gathered.

The target sampling frame comprises form masters and mistresses from senior high schools, specifically within Ghana's five defined regions: Northern, Southern, Eastern, Western, and Central. The study aimed to sample this specific subset of the population.

Sampling Technique and Sample Size: In this study, the researchers employed stratified sampling to ensure that our sample accurately represents the diverse population of form masters and mistresses across Ghana's senior high schools. Stratified sampling was chosen because it effectively addresses potential biases by dividing the population into distinct sub-groups or strata, such as regions (Northern, Southern, Eastern, Western, and Central) or types of schools. This method allows for the proportional representation of each sub-group in the final sample, enhancing the findings' generalizability and accuracy.

Given the successful retrieval of data from a sample of 840 respondent, the stratified sampling ensured that each region or type of school is adequately represented, capturing the full spectrum of experiences and perspectives. This approach minimized the risk of skewed results and ensured that the population's diversity was reflected in the sample. The stratified sampling method enhanced the reliability (Cronbach's Alpha coefficients exceeding 0.70, see Table 3) of the study's conclusions by providing a balanced and representative dataset.

For quantitative research, particularly when using techniques like Structural Equation Modeling (SEM), a sample size of 840 is generally considered robust. It provides sufficient statistical analysis power and helps ensure the results are generalizable and reliable. SEM typically requires a larger sample size to achieve stable and reliable estimates. While specific recommendations can vary, a sample size of 300 or more is often considered adequate for SEM (Hair et al., 2010). Therefore, the sample of 840 respondents employed in the present study exceeds this threshold and should support thorough and valid analyses.

Data Collection Tool: A structured questionnaire was used to collect data for the analysis, as it is an effective method for gathering large-scale data in quantitative research (Taherdoost, 2021). Respondents answered using a five-point Likert scale, which offered a balanced range of options from positive to negative, minimizing confusion (Sarstedt & Mooi, 2019). The questionnaire was distributed in person to 905 form masters and mistresses across senior high schools in Ghana's five regions: Northern, Southern, Eastern, Western, and Central. Out of the 905 questionnaires distributed, 840 were successfully retrieved, resulting in a response rate of 92.8%.

Data Analytic Tools: The collected data were thoroughly checked for errors and cleaned before analysis using Statistical Package for Social Sciences (SPSS) version 26.0. The research instruments were reviewed for completeness and consistency, and the data were coded before conducting statistical analyses. Descriptive statistics, including means and standard deviations, were employed to summarize teacher-led school aims, teachers-led school objectives, and teachers' problem-solving skills. Pearson correlation analysis was utilized to examine the relationships between these variables. Structural Equation Modeling (SEM) was applied to investigate the predictive linkages among the constructs. SEM is particularly effective for exploring the

complex interplay between constructs such as teacher-led school aims, teacher-led school objectives, and teachers' problem-solving skills.

RESULTS

This section presents the results of the analysis using descriptive statistics tools, Pearson correlation analysis, and Structural Equation Modelling (SEM) with Smart PLS version 3.0. The study explored how teacher-led development of school aims and objectives impact their problem-solving skills. The relationships between teacher-led aims and school's objectives, as well as teacher problem-solving skills were also examined. Correlation analysis was conducted, and the findings are detailed in Tables 1.

Table 1 presents the correlation coefficients among the study variables: teachers-led school aims, teacher-led school objectives, and teachers' problem-solving skills. Teachers-led school aims positively correlates with teachers-led school objectives, ($r = 0.508, p < .01$), indicating a moderate relationship between these two factors. Teachers' school aims also show a weak positive correlation with teachers' problem-solving skills ($r = 0.131, p < .01$). Teachers-led school objectives positively correlate with teachers' problem-solving skills ($r = 0.314, p < .01$). All correlations are statistically significant at the 0.01 level, suggesting these relationships are not due to random chance.

Table 1: Correlation Coefficient Among School Aims, Objectives, and Teacher Problem-Solving Skills

Study Variables	Mean	S. D	N	1	2	3
1 Teacher-Led School – Aims	18.0345	4.89801	840			
2 Teacher-Led School – Objectives	12.4417	2.15246	840	.508**		
3 Teachers problem-solving skills	75.5500	6.06322	840	.131**	.342**	

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey, 2024

Measurement Model Assessment: The measurement model was evaluated by examining key aspects such as factor loadings, composite reliability, convergent validity, discriminant validity, R-squared (Coefficient of Determination) multicollinearity, and model fit.

Factor Loadings: We assessed the factor loadings to confirm that each item significantly loaded onto its respective construct. Factor loadings above 0.60 were deemed acceptable (Hair, et al., 2017; Hair, 2021), indicating that the items are strong indicators of their corresponding constructs.

Table 2: Factor loading of Teacher Led School's Aim-Objective and Problem Solving

Variable	Teacher_Problem-Solving_Skills	Teacher Led_School-Aims	Teacher Led_School-Objective
ILAOTS1		0.751	
ILAOTS2		0.836	
ILAOTS3		0.839	
ILAOTS4		0.864	
ILAOTS5		0.823	
ILAOTS6		0.781	
ILAOTS7		0.718	
ILSO10			0.765
ILSO11			0.745
ILSO8			0.882

ILSO9			0.856
PSSEP	0.375		
PSSITP	0.870		
PSSRP	0.767		

Source: Field Survey, 2024

Reliability and Validity: In Table 3, we assessed the reliability and validity of our measurement instruments using several key metrics. Cronbach's Alpha measure evaluates the internal consistency of a set of items or how closely related they are within each construct. A higher value, close to 1, reflects good reliability. As shown in Table 3, Cronbach's Alpha coefficients exceeding 0.70 confirm that our scales are internally consistent and reliable (Sarstedt & Mooi, 2019). Like Cronbach's Alpha, rho_A assesses internal consistency but is often employed in more advanced statistical models. Our rho_A values, as shown in Table 3, corroborate the strong internal consistency observed with Cronbach's Alpha.

Composite reliability measures the overall reliability of a construct, indicating how well the indicators collectively represent the construct. A value above 0.7 is deemed acceptable (Sarstedt & Mooi, 2019). Our constructs demonstrate excellent composite reliability, indicating that the items collectively provide a dependable measure. Average Variance Extracted (AVE) assesses the proportion of variance a construct captures relative to the variance due to measurement error. A value above 0.5 is considered good (Hair, 2021). Our constructs meet this criterion.

Table 3: Construct Reliability and Validity of Teacher Led School's Aim-Objective and Problem Solving

Variables	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Teacher-Led School-Aims	0.521	0.665	0.728	0.505
Teacher-Led School-Objective	0.908	0.912	0.927	0.645
Teachers Problem-Solving Skills	0.834	0.867	0.887	0.663

Source: Field Survey, 2024

Discriminant Validity of Teacher Led School's Aim-Objective and Problem Solving

Discriminant validity measures how distinct a construct is from others. It is evaluated by comparing the square root of the AVE with the correlations between constructs. A construct is considered to have good discriminant validity if the square root of its AVE is greater than its correlations with other constructs. From Table 4, all the diagonal values representing the square root of its AVE are greater than correlations with other constructs.

Table 4: Discriminant Validity (Fornell-Larcker Criterion) of Teacher Led School's Aim-Objective and Problem Solving

Variables	1	2	3
1 Teacher-Led School-Aims	0.704		
2 Teacher-Led School-Objective	0.123	0.803	
3 Teachers problem-solving skills	0.369	0.521	0.814

Source: Field Survey, 2024

The R² value of 0.272 indicates that 27.2% of the variance in Teachers' Problem-solving skills can be explained by the independent variables' teachers'- led school aims and teachers'- led School Objectives. The adjusted R² value is 0.271, slightly lower than the R² value. This adjustment accounts for the number of predictors and sample size, showing that the model is not overfitted and still explains 27.1% of the variance in Teachers' Problem-solving skills after considering these factors. The R² value of 0.142 and adjusted R² of 0.140 refer to the same thing: they indicate that teachers-led school objectives explain 14.2% (or 14.0% after adjustment) of the variance in Teachers' Problem-solving skills. This lower percentage suggests that while there are some relationships, the influence of this independent variable on Teachers' Problem-solving skills is relatively small.

Table 5: Coefficient of Determination (R Square) for School Objectives and Teacher Problem solving Skills

Variables	R Square	R Square Adjusted
Teacher-Led School-Objective	0.271	0.271
Teachers Problem-Solving Skills	0.142	0.140

Source: Field Survey, 2024

Model Fit of Teacher Led School’s Aim-Objective and Problem Solving

Table 5 shows that the saturated and estimated models demonstrate an excellent fit, with an SRMR of 0.06 (Kock, 2017). The models also present acceptable d_ULS and d_G values of 1.174 and 0.406, respectively, along with a Chi-Square value of 1966.384. Furthermore, a Normed Fit Index (NFI) of 0.706 indicates a moderate fit.

Table 6: Model Fit of School Aims, Objectives, and Teacher Problem-solving Skills

Variable	Saturated Model	Estimated Model
SRMR	0.06	0.06
d_ULS	1.174	1.174
d_G	0.406	0.406
Chi-Square	1966.384	1966.384
NFI	0.706	0.706

Source: Field Survey, 2024

Multicollinearity of Teacher Led School’s Aim-Objective and Problem Solving

We used the Variance Inflation Factor (VIF) to check for multicollinearity. VIF values were assessed for each predictor variable. Values above 5 indicate potential multicollinearity issues, suggesting that some variables are highly correlated. Our model's VIF values were within acceptable limits, confirming that multicollinearity was not a significant concern.

Table 7: Multicollinearity of Teacher Led School’s Aim-Objective and Problem Solving

Variable	VIF
ILAOTS1	1.960
ILAOTS2	2.899
ILAOTS3	3.004
ILAOTS4	3.178
ILAOTS5	2.928
ILAOTS6	2.676

ILAOTS7	2.190
ILSO10	1.894
ILSO11	1.861
ILSO8	2.406
ILSO9	2.212
PSSEP	1.161
PSSITP	1.201
PSSRP	1.375

Source: Field Survey, 2024

Structural Model of Teacher Led School’s Aim-Objective and Problem Solving

The present study integrated the teacher led school’s aim and objective into the model as predictors and problem solving as the dependent variable, the resultant model was fit to the sample data, see Figure 1 below. The path coefficients were assessed for statistical significance mainly at $p < .05$, with $p < .01$ being preferable and $p < .001$ most preferable. The results are presented in Table 8 below.

Table 8: Direct and Indirect Structural Hypothesis Testing Results

Hypothesis	Structural paths relationship	Beta	T Statistics	P Values	Decision
H1	Teacher Led_School-Aims -> Teacher_Problem-Solving_Skills	-0.095	0.729	0.466	Not Supported
H2	Teacher Led_School-Objective -> Teacher_Problem-Solving_Skills	0.418	5.355	0.0001	Supported
H3	Teacher Led_School-Aims -> Teacher Led_School-Objective	0.521	24.349	0.0001	Supported
H4	Teacher Led_School-Aims -> Teacher Led_School-Objective -> Teacher_Problem-Solving_Skills	0.218	5.356	0.0001	Supported

Source: Field Survey, 2024

The result showed that teacher-led school aims did not have a significant positive influence on teacher problem-solving skills, per the model depicted in Figure 1 below. This result did not support Hypothesis 1 (H1) which states that H1: Teacher-led school aims to have a significant positive influence on teacher problem-solving skills. Although teacher-led school aim was shown to have a significant but weak positive correlation with teachers’ problem-solving skills ($r = 0.131, p < .01$), the SEM path analysis result shows that teachers-led school aims did not significantly influence teacher problem-solving skills ($\beta = -0.095, t = 0.729, p = ns$), which is not in support of hypothesis 1. Further examination of Figure 1 revealed that the results support Hypothesis 2 (H2) which states that H2: Teachers-led school objectives significantly positively influence teacher problem-solving skills. The result shows that teachers-led school objectives significantly and positively influence teacher problem-solving skills. ($\beta = 0.418, t = 5.355, p < .0001$), supporting hypothesis 2.

The mediating role of teacher-led school objectives on the relationship between teacher-led school aims and teacher problem-solving skills was explored and results are presented in Table 4.8 above. The path coefficient of the linkage between teacher-led school aims and school objectives was significant ($\beta = 0.521, t = 24.349, p < .0001$) in support of. The results showed that the data supports H4: Teacher-led school objectives significantly mediate the relationship between developed school aims and teacher problem-solving skills ($\beta = 0.218, t = 5.356, p < .0001$). In other words, the mediating effect of teacher-led school objectives on the association between the teacher-led school aims and his/her problem-solving skills is significant.

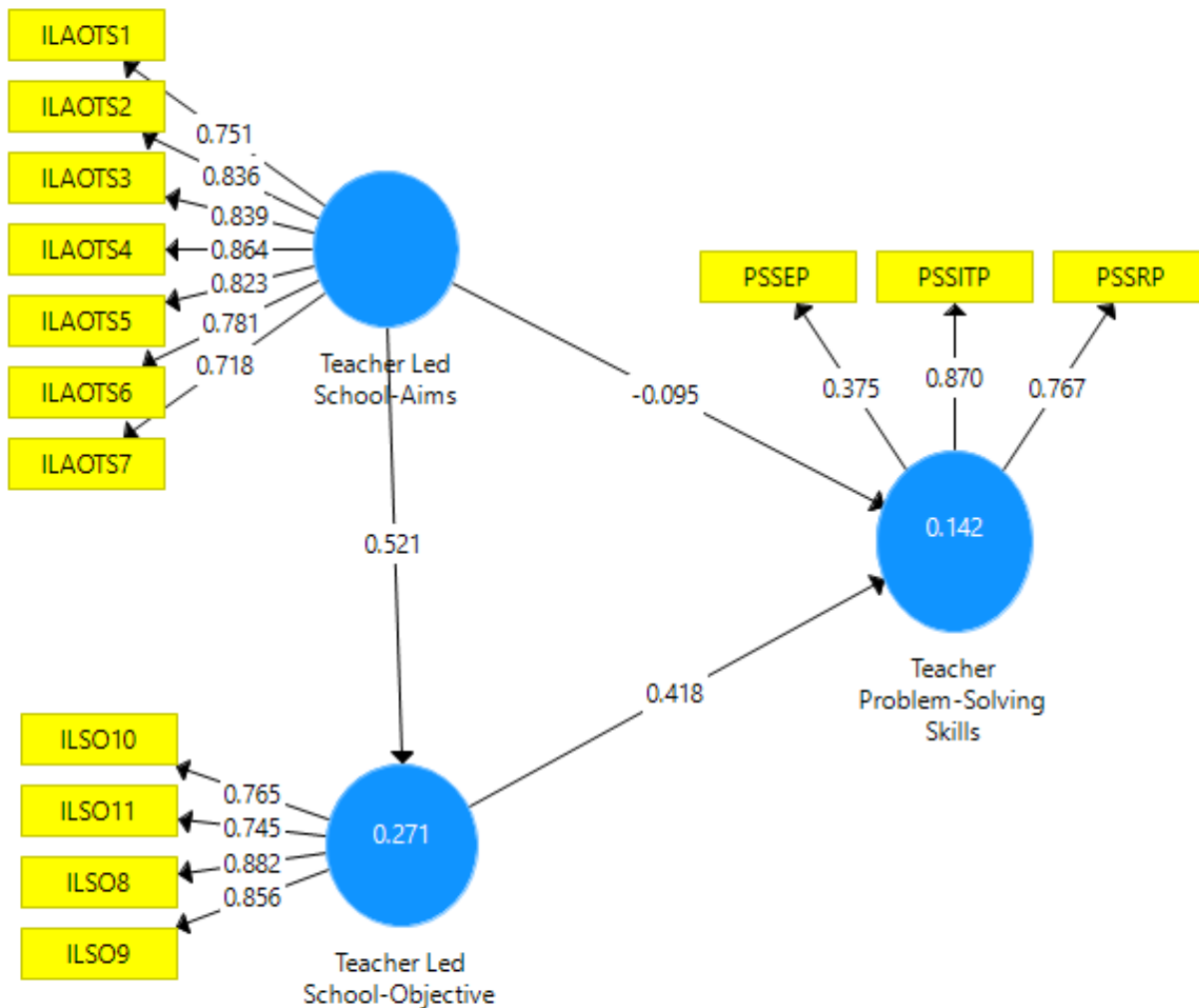


Figure 2. Structural Model of Teacher Led School's Aim-Objective and Problem Solving

DISCUSSION

This study investigates the impact of teacher-led school aims and objectives on teachers' problem-solving skills in Ghana, focusing on the mediating role of teacher-driven school objectives. Utilizing a quantitative research approach, data were collected from a sample of teachers across multiple schools in five regions of Ghana. The analysis showed that the data did not support the hypothesis that H1: Teacher-led developed school aims positively and significantly influence teacher's problem-solving skills, however, other three hypotheses, that is, hypothesis: H2: Teacher-led developed school objectives positively and significantly influence teachers' problem-solving skills; hypothesis: H3: Teacher-led school aims is significantly related with teacher-led school objectives; and hypothesis: H4: Teacher-led school objectives significantly mediate the relationship between developed school aims and problem-solving skills among teachers were supported by the data.

The finding that teacher-led school aims did not significantly influence teacher problem-solving abilities could be explained by the abstract nature of broader school aims. While aims provide the school's overarching vision or long-term goals, they may not directly impact day-to-day teacher activities or learning outcomes unless translated into specific objectives and classroom practices. This aligns with the view that broader goals, while important, must be broken down into actionable steps to have a tangible impact on teacher outcomes. This finding reinforces the argument of Noddings (2007) that educational aims must be discussed within the context of all activities sponsored by schools. Such activities should not only be curriculum related but should include teacher's problem-solving activities since teachers have been projected as persons who respond to all the challenges they encounter in their daily professional works (Orgoványi-Gajdos, 2016). This finding adds a new layer to our understanding how educational aims are operationalized in Ghanaian schools.

The present study's finding that teacher-led developed school objectives positively and significantly influence teachers' problem-solving skills aligns and builds on the work of Forneris, Danish and Scott (2007) who demonstrated that the adolescents are able to learn how to set goals and develop strategies to solve problems. Ghanaian headteachers should encourage teachers to participate in the development of learning objectives which in the view of Noddings (2007) is crucial for improving problem-solving abilities. The findings further align with previous research and add to the suggestion that clearly defined educational goals set by teachers can directly enhance cognitive and critical thinking skills: analytical thinking and problem-solving (Bunar, 2011; Güven & Çabakçor, 2013; Özgen et al., 2017; Özpınar & Arslan, 2023; Özsoy, 2005). Teacher-led school objectives often serve as actionable steps that guide instruction and teacher engagement, critical to developing problem-solving skills. This supports the idea that teachers can align their teaching strategies more effectively when they have specific, measurable goals, providing teachers with opportunities to practice and refine these essential skills.

Regarding the mediating role of teacher-led school objectives between teacher-led school aims and teachers' problem-solving skills, school objectives serve as the mechanism through which broader aims are translated into practice. Without clear objectives, broad aims might remain too abstract to influence teacher behavior directly. The findings that teacher-led school aim is significantly related with teacher-led school objectives reinforced the position that teachers should think first about how objectives fit with larger goals and aims (Noddings, 2007) while employing the objectives to translate the goal of an institution into concrete action (Babalola, c2014). The findings further support the view that aims directly influence how individuals construct their goals and objectives (Noddings, 2007).

The data supported the hypothesis that teacher-led school objectives significantly mediate the relationship between developed school aims and problem-solving skills among teachers. This mediating effect suggests that while schools aim to provide a necessary vision, these aims can positively influence teacher problem-solving abilities through the development and implementation of specific, teacher-led objectives. This finding strengthened Noddings' (2007) argument that teachers should consider formulating objectives which are compatible with goals that fit the more general aims and work towards improving problem solving (Özpınar & Arslan, 2023) 'for a balanced development of the society' (Babalola, 2014, p.810). The objectives are likely to act as a bridge, ensuring that the school's broader goals are realized through day-to-day instructional strategies that encourage critical thinking.

This finding contributes new knowledge to educational leadership and pedagogy literature, particularly in the Ghanaian context. It highlights the importance of breaking down larger educational goals into specific, measurable objectives to foster problem-solving skills effectively. Future studies could explore this mediating role further, examining how different types of objectives—such as those focused on academic achievement versus social or emotional development—might influence various aspects of teaching and learning outcomes

Theoretical Implications

This study's use of the Creative Problem Solving (CPS) Theory highlights the relevance of fostering creative and structured thinking processes to enhance teachers' problem-solving skills. CPS Theory emphasizes the importance of guiding individuals through problem identification, idea generation, and solution implementation. The findings suggest that teacher-led objectives aligned with CPS principles can improve teachers' capacity to approach problems systematically and creatively. This reinforces the idea that structured teaching approaches, aligned with problem-solving models, significantly enhance cognitive skills in teachers. Therefore, the study provides empirical support for applying CPS Theory in educational settings, suggesting its viability for guiding teacher development in problem-solving. Future research can build upon this foundation to explore how other creative approaches can be integrated into classroom objectives.

To Goal-Setting Theory, which posits that clearly defined and challenging goals enhance performance, this study illustrates the critical role of teacher-led objectives as mediators between broad educational aims and actual teacher outcomes. Goal-setting theory suggests that specific and measurable objectives motivate

individuals to achieve higher performance, and this aligns with the findings that teacher-led objectives foster improved problem-solving skills. The study provides theoretical implications for educational leadership by confirming that well-defined school objectives act as mechanisms that channel broader aims into effective learning practices. This offers new insights into how Goal-Setting Theory can be applied in educational contexts, particularly regarding the setting and achievement of learning outcomes.

Practical Implications

From a practical perspective, the findings imply that educators should prioritize the development of clear, structured objectives in their instructional designs. Teachers can incorporate the principles of CPS Theory into their daily lesson plans to enhance problem-solving capabilities among teachers. Specifically, educators should create opportunities for teachers to engage in creative thinking processes, guiding them through stages of problem-solving that foster analytical and critical thinking. Furthermore, incorporating problem-based learning and project-based activities into the curriculum can provide practical platforms for teachers to apply their problem-solving skills in real-world contexts.

Goal-setting theory suggests that teachers should set specific, measurable, and attainable classroom objectives. By translating broad school aims into clear, actionable goals, teachers can help teachers focus on achievable tasks that progressively develop their problem-solving abilities. Educators can utilize formative assessments and feedback mechanisms to monitor teachers' progress toward these objectives, ensuring continuous improvement in their cognitive development.

Policy Implications

On the policy front, the study's findings highlight the need for educational policymakers to support teacher training and curriculum development focused on problem-solving skills. Policymakers should mandate professional development programs that equip teachers with the knowledge and tools to implement Creative Problem-Solving (CPS) classroom strategies. Policies should also encourage the incorporation of CPS frameworks into national curriculums, ensuring that problem-solving becomes a core component of educational programs across all levels.

In line with the Goal-Setting Theory, policymakers should also establish guidelines that require schools to set clear, measurable educational objectives that align with national or regional educational aims. Policies could ensure that school leaders and teachers are trained in effective goal-setting strategies, linking broad educational goals and specific classroom outcomes more explicitly. This would promote consistency and accountability in educational practices, ensuring all teachers benefit from well-defined learning objectives supporting their intellectual and problem-solving growth.

LIMITATIONS

The study is based on data collected from schools in a specific region of Ghana, which may limit the generalizability of the findings to other contexts. Differences in educational systems, cultural factors, and socioeconomic environments could influence the applicability of the results in other regions or countries. Future studies should involve broader and more diverse samples to ensure wider applicability.

The study primarily used self-reported data from teachers, which can introduce response bias, such as social desirability bias. Participants might have reported what they believed was expected rather than their experiences or outcomes. This may affect the accuracy of the findings.

The study employed a cross-sectional design, which limits the ability to infer causal relationships between teacher-led objectives and aims and teacher problem-solving skills. Longitudinal studies that track changes over time would provide a clearer understanding of the cause-and-effect dynamics among these variables.

While the study provides quantitative evidence on the relationships between teacher-led objectives and teacher outcomes, it does not delve deeply into the qualitative experiences of teachers and students. Understanding how these objectives are perceived and implemented in practice could add valuable context to the findings.

The study focused on teacher-led school objectives mediating school aims and teacher problem-solving skills. Other potential mediators, such as classroom environment, teaching methods, or student motivation, were not explored, which may leave out important factors influencing student outcomes.

RECOMMENDATIONS AND FUTURE DIRECTIONS

Future studies should expand the scope by including schools from various regions and cultural contexts to enhance the generalizability of the findings. Comparative analyses of different educational systems could offer more insights into how teacher-led objectives affect problem-solving skills.

Future research should adopt longitudinal designs to examine how teacher-led objectives and school aims change student problem-solving skills over time. This approach would provide more definitive evidence of causal relationships and help understand educational strategies' long-term impact on student outcomes.

Future studies should investigate other potential mediators, such as teaching methods, student engagement, or technological tools in the classroom, to provide a more comprehensive understanding of the factors influencing the relationship between school aims and teacher outcomes.

To complement quantitative findings, future research could incorporate qualitative approaches, such as interviews or focus groups, to gain deeper insights into teachers' and students' experiences regarding implementing school objectives. This would help contextualize the quantitative results and provide a richer understanding of the processes involved.

Future research should explore the role of teacher training and professional development in shaping effective school objectives. Investigating how well-equipped teachers are to set and achieve objectives that enhance problem-solving skills would be valuable in developing more targeted interventions for educators.

Conducting intervention-based studies that implement specific teacher-led objectives aimed at improving problem-solving skills would provide evidence of the practical effectiveness of these strategies. Researchers could measure the direct impact of structured problem-solving programs and compare outcomes with control groups.

Future studies could explore how teacher-led objectives influence problem-solving skills in various subjects, such as science, mathematics, or language arts. Investigating whether these skills transfer across disciplines would help educators understand the broader application of problem-solving frameworks in education.

CONCLUSIONS

The objective of this study was to investigate the influence of teacher-led school aims and objectives on teachers' problem-solving skills in Ghana, with a specific focus on the mediating role of teacher-led school objectives in these relationships. The study sought to explore how these educational strategies shape teachers' ability to approach and solve complex problems, which is crucial for academic success and future professional development.

The study's findings revealed that teacher-led school objectives significantly positively impact teachers' problem-solving skills. This indicates that when schools set clear, structured objectives aligned with practical outcomes, teachers are better equipped to engage in creative and analytical thinking. However, the study also found that teacher-led school aims, while important, did not significantly affect teachers' problem-solving abilities. While schools' long-term goals and ambitions are vital for vision-setting, day-to-day objectives directly influence teachers' practical skills.

This study's unique contribution is examining the mediating role of teacher-led school objectives. The findings revealed that these objectives mediate the relationship between broader school aims and teacher problem-solving skills, a concept not extensively covered in prior research. This original contribution highlights the importance of linking overarching school goals with specific, actionable objectives to foster teachers' cognitive abilities.

Additionally, the study provides theoretical implications by integrating the Creative Problem Solving (CPS) Theory and Goal-Setting Theory to understand the relationship between school leadership and teacher outcomes. The use of these theories underscores the importance of strategic goal-setting and structured leadership in developing teachers' problem-solving capacities.

The study offers practical and theoretical insights, emphasizing the need for clear, actionable school objectives to promote effective problem-solving skills among teachers. The research contributes to educational leadership literature by clarifying the role of school aims versus objectives and introducing the mediating role of objectives, offering valuable implications for educators, policymakers, and researchers.

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