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Article

Shaping success: How instructional leadership influences teaching practices and self-efficacy

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Abstract: This study explores teachers' perceptions of instructional leadership qualities that enhance self-efficacy and classroom practices through Q-methodology, using a snowball sample of state-certified teachers from Pennsylvania and Ohio. Key findings highlight leadership qualities such as positive reinforcement, support, constructive feedback, modeling, trust, autonomy, and collaboration as crucial for teacher growth and instructional effectiveness. Differences in perceptions between elementary and secondary teachers are also examined. The results are organized into five thematic profiles: Sculptors of Curiosity and Creativity, Orchestrators of Harmony and Growth, Champions of Potential and Possibility, Architects of Confidence and Curiosity, and Masterminds of Adaptability and Structure. The study provides valuable insights into leadership traits that foster teacher development and improve classroom outcomes.

Keywords: instructional leadership; teacher self-efficacy; classroom practices; Q-methodology; leadership qualities

1. Introduction

Instructional leadership is foundational in education, cultivating successful teaching methods and enhancing student learning outcomes [1]. Educational leadership provides support and empowerment to teachers [2], significantly influencing teacher self-efficacy, or an individual's belief in their ability to promote student learning effectively [3]. Despite extensive research on instructional leadership and teacher self-efficacy, there is a notable gap in the literature regarding the use of Q-methodology to explore how these concepts intersect. This study addresses this gap by applying Q-methodology to capture diverse teacher perspectives and identify patterns in how instructional leadership shapes their beliefs and practices.

Albert Bandura's Social Cognitive Theory (SCT) provides a robust theoretical foundation for this exploration. SCT emphasizes triadic reciprocal determinism—the dynamic interplay between personal, behavioral, and environmental factors [4]. This framework is particularly relevant in educational settings, where instructional leadership creates environments that shape teachers' self-efficacy through feedback, modeling, and collaborative practices [5]. By linking Bandura's theory to instructional leadership practices, this study highlights the mechanisms through which leaders influence teacher development and classroom effectiveness.

1.1. Teacher self-efficacy

Albert Bandura's Social Cognitive Theory (SCT) provides the basis for understanding teacher self-efficacy. Self-efficacy refers to teachers' confidence in designing lessons, managing classrooms, and implementing effective teaching strategies [6]. High self-efficacy impacts educators' motivation, resilience, and instructional choices, fostering positive classroom climates and student engagement [7]. Self-efficacy beliefs are influenced by accomplishments, observations, societal feedback, and physiological states [4].

Teacher self-efficacy directly correlates with teaching effectiveness and student outcomes. Educators with strong self-efficacy set ambitious goals, persist through challenges, and employ adaptive instructional practices that address diverse student needs [8]. These teachers create positive classroom environments, manage student behavior effectively, and maintain high levels of student engagement and achievement [9,10].

1.2. Theoretical framework

Bandura's SCT emphasizes triadic reciprocal determinism—the interaction of personal, behavioral, and environmental factors [4]. In educational settings, instructional leaders influence teachers' self-efficacy by shaping supportive environments, providing professional development, and fostering collaborative cultures [5]. Through observational learning, feedback, and goal setting, instructional leaders enable teachers to develop confidence and improve their instructional practices [11].

1.3. Instructional leadership

Instructional leadership prioritizes teaching and learning activities to improve school performance [12]. Effective instructional leaders set clear goals, promote collaboration, and engage in professional development efforts [13]. Instructional leadership differs from managerial leadership by focusing on instructional quality, curriculum oversight, and teacher support [14].

Instructional leadership emerged in the 1970s as researchers examined effective schools serving diverse populations [12]. By the 1980s, principals' responsibilities expanded to include instructional supervision alongside administrative tasks [15]. Recent reforms, such as the No Child Left Behind Act (NCLB) and Every Student Succeeds Act (ESSA), emphasize accountability and teacher quality, further shaping instructional leadership practices [16,17].

Instructional leadership enhances teacher self-efficacy by promoting clear instructional goals, providing resources, and offering constructive feedback [18]. Leaders establish trusting relationships and professional learning communities to support teachers' growth, ultimately improving student achievement [19].

Key Practices of Instructional Leadership.

Instructional leaders articulate a clear vision and set measurable goals to align instructional practices with school priorities [20]. A compelling vision fosters shared purpose, accountability, and motivation among teachers [2]. Collaborative goal-setting processes promote teacher buy-in and continuous improvement [21].

Instructional leaders provide resources, mentorship, and professional development to enhance instructional practices [22]. Support includes access to high-quality teaching materials, coaching sessions, and structured professional learning communities [23]. Leaders ensure alignment between curriculum standards and instructional strategies to meet student needs [24].

Effective instructional leaders deliver constructive, timely feedback to improve teaching effectiveness. Formative evaluations provide ongoing support, while summative evaluations assess overall teacher performance [25,26]. A balanced approach to feedback fosters professional growth and enhances classroom instruction [27].

1.4. Impact of instructional leadership on teacher self-efficacy

Instructional leadership significantly influences teacher self-efficacy. By providing constructive feedback, targeted support, and professional development, instructional leaders empower teachers to refine their instructional practices [28]. Teachers with strong self-efficacy demonstrate greater confidence in managing classrooms, fostering student engagement, and achieving learning goals [29].

Instructional leaders foster collaborative school cultures, where teachers share insights, engage in reflective practices, and build collective efficacy [30]. This collaboration enhances teachers' belief in their ability to implement effective instructional strategies and positively impact student learning [2].

1.5. Relationship to classroom instruction improvement

Instructional leaders play a pivotal role in improving classroom instruction by setting instructional goals, offering guidance, and creating a supportive environment. Clear goals provide direction for teachers, aligning instructional practices with student learning objectives [20]. Leaders facilitate ongoing reflection and feedback cycles, identifying areas for improvement and fostering continuous professional growth [21].

By providing curriculum and instructional support, instructional leaders ensure that teachers have the tools and resources to deliver high-quality instruction. This support enhances teachers' confidence in addressing student needs, managing classroom dynamics, and implementing innovative teaching strategies [31].

1.6. Education policy and leadership focus

Federal and state policies have shaped instructional leadership practices over the past two decades. NCLB emphasized accountability through standardized testing, compelling instructional leaders to focus on data-driven decision-making [12]. Race to the Top (RTTT) encouraged systemic reforms, innovation, and performance-based teacher evaluations [32]. ESSA granted states greater flexibility in designing accountability systems, promoting equity and holistic approaches to student success [16].

These legislative shifts underscore the evolving role of instructional leadership. Principals are now tasked with fostering innovation, supporting teacher development, and promoting student-centered learning environments [33]. Effective instructional

leaders navigate these policy demands by balancing accountability with teacher empowerment and instructional support [34].

Instructional leadership is instrumental in enhancing teacher self-efficacy and improving instructional practices. Effective leaders set clear goals, provide targeted feedback, and foster collaborative cultures that empower teachers to excel in their professional roles. Teacher self-efficacy, shaped by instructional leadership, directly influences classroom instruction, student engagement, and academic success.

Understanding the relationship between instructional leadership and teacher self-efficacy is essential for fostering positive school cultures, supporting professional growth, and achieving equitable learning outcomes for all students. Future research should explore the specific leadership qualities teachers find most impactful in enhancing their self-efficacy and instructional effectiveness.

2. Methods

The objective of this study is to explore and identify the instructional leadership qualities that teachers perceive as most critical for fostering effective classroom practices, enhancing their sense of self-efficacy, and promoting professional growth. By employing a mixed-methods approach, specifically Q-methodology, the study aims to examine the specific leadership qualities that teachers believe have the greatest impact on their instructional practices and confidence as educators. Additionally, it seeks to investigate potential differences in perceptions between elementary and secondary school teachers regarding the importance of these leadership qualities in relation to their sense of instructional self-efficacy. Furthermore, the study endeavors to determine how these instructional leadership qualities contribute to teachers' professional growth and development, as well as their influence on classroom practices and the confidence to implement effective teaching strategies. Ultimately, the findings aim to provide valuable insights for school leaders to refine their leadership practices in ways that support teacher effectiveness and improve student learning outcomes.

Teacher perceptions of instructional leadership qualities that impact classroom practices and teacher self-efficacy can be measured best through a mixed-methods approach using Q-methodology. The study was informed by the following research questions:

1) What specific instructional leadership qualities do teachers perceive as most important for principals to exhibit to positively impact classroom instructional practices and enhance teachers' self-efficacy beliefs?
2) What are the differences, if any, in how elementary and secondary school teachers perceive the importance of various instructional leadership qualities exhibited by their principals in relation to their own sense of instructional self-efficacy?
3) What are the most significant instructional leadership qualities that teachers perceive as impacting their professional growth, development, and sense of self-efficacy as instructors?
4) How do these leadership qualities translate to changes in teachers' classroom instruction and their confidence in implementing effective teaching practices?

2.1. Participants

Participants in this Q-methodology study were full-time, state-certified teachers from Pennsylvania and Ohio, purposefully selected to capture diverse perspectives on instructional leadership. Following Watts and Stenner's [35] guidelines, participants were chosen for their ability to provide informed, relevant, and objective viewpoints. The recommended sample size ranged from 12 to 60 participants based on guidance from Rogers [36], Brown [37], Stephenson [38], and Webler et al. [39].

Teachers were recruited through purposeful and snowball sampling. Invitations were sent electronically, ensuring voluntary participation without pressure. Emails included a detailed study overview and a unique link to the QMethod Software platform, maintaining participant anonymity through four-character alphanumeric IDs. Informed consent was obtained when participants registered, and personal data was never stored in the system.

Participants completed the Q-sort and follow-up survey through the QMethod Software. To ensure demographic diversity, participants provided information on current grade level, years of teaching experience, state of certification, and highest degree earned. This process supported a well-rounded representation of teacher perspectives on instructional leadership qualities that impact self-efficacy and classroom practices.

2.2. Instrumentation: Developing the concourse

Q-methodology begins by establishing and constructing a concourse, as outlined by Watts and Stenner [35]. A concourse refers to a compilation of statements that represent several potential viewpoints on the study subject [35]. A well-designed Q-set consists of concise assertions that each provide unique information and do not repeat each other [35]. Furthermore, it is important that the concluding comments in the concourse not be influenced by any certain perspective or bias [35].

According to Stephenson [38], a concourse typically includes multiple unique perspectives for observing and discussing the subject being studied. Multiple methods can be employed to construct a concourse. The concourse statements for this study were collected from Tschannen-Moran and Woolfolk Hoy's Teachers' Sense of Efficacy Scale (TSES) [40]. The study includes a list of 24 statements, which can be found in **Table 1**.

Table 1. Proposed concourse statements.

Proposed Concourse Statements for the Q-Sort
I can get through to the most difficult students.
I have little control over helping students think critically.
I have control over disruptive behavior in the classroom.
I have no control over students who show low interest in schoolwork.
My expectations about student behavior are clear.
My students believe they can do well in schoolwork.
I am fully capable of responding to difficult questions from my students.
Routines to keep my activities running smoothly cannot be established.

Table 1. (*Continued*).

Proposed Concourse Statements for the Q-Sort
Training on how to help my students value learning is needed.
Student comprehension of what I taught can be gauged.
Good questions for my students can be crafted.
Student creativity can be fostered.
Children follow classroom rules.
A failing child can improve.
A student who is disruptive and noisy can be calmed.
A classroom management system can be established with each group of students.
My lessons can be adjusted to the proper level for individual students.
Assessment strategies should be varied.
A few problem students can ruin my entire lesson.
An alternative explanation or example can be provided when students are confused.
I respond well to defiant students.
Families need my support in helping their students do well in school.
Alternative strategies can be implemented in my classroom.
Capable students are challenged.

Additionally, three open-ended questions were provided for the participants:

1) In what ways do the specific leadership behaviors and actions of your principal influence your instructional methods and your confidence in teaching?
2) Can you describe any experiences where your principal's instructional leadership has either positively or negatively affected your professional development and growth as a teacher?
3) Think about your professional growth as a teacher over the past year. How has your instructional leader helped your teaching efficacy evolve during this time, and what events or experiences influenced this change?

These questions provided an opportunity for participants to share experiences or information that was not addressed by the Q-sort method.

2.3. Procedures

After receiving approval from the Youngstown State University Human Subjects Institutional Review Board, participants were recruited through purposive sampling via email invitations. This method ensured a representative sample of individuals with well-formed perspectives on the research topic, consistent with Q-methodology guidelines [35]. Emails outlined the study's purpose and estimated time commitment of 30 to 45 minutes, helping filter out individuals with limited interest in the topic.

The study posed no risk of harm, and no personally identifiable information was collected. Participants completed the Q-sort using the QMethod Software, an online platform accessible on any device without requiring downloads. The software securely captured and stored data, reducing human error [41]. Participants were given two weeks to complete the Q-sort at their convenience.

Comprehensive study details were provided, emphasizing data anonymization, confidentiality, and the voluntary nature of participation. Participants could withdraw at any time without consequences. Upon completing the study, they had the option to request a copy of the findings. During the Q-sort, participants responded to the prompt: *"What instructional leadership qualities are most important for impacting teacher self-efficacy and classroom practices?"* They sorted 24 concourse statements based on their perspectives using a forced distribution method, ranking statements from "strongly disagree" to "strongly agree." This method ensured that all statements were thoughtfully evaluated and placed within the distribution framework. Upon completing the Q-sort and survey, participants could enter a drawing for one of two $50 Amazon gift cards. A separate link directed participants to an independent electronic form where they provided contact information (email or phone number) solely for prize notification. This process maintained anonymity by keeping the form distinct from Q-sort and survey responses. The system generated unique identifiers for all entries, ensuring confidentiality. Winners were selected using a digital random number generator, ensuring an unbiased and transparent selection process. This incentive encouraged participation while upholding the study's ethical standards of anonymity and data security.

3. Results

Participants were provided with a link to complete this study. The survey was sent to 221 individuals, of whom 18% (n = 40) chose to participate. Five participants decided not to participate in the demographic questions. The participants were asked to indicate in what state, Pennsylvania or Ohio, they currently teach. Of the 35 participants, 17% (n = 6) currently teach in Ohio and 83% (n = 29) currently teach in Pennsylvania. The participants were asked to indicate how many years of teaching experience they acquired and their current teaching level. Of the 35 that chose to respond, 9% (n = 3) had 0–5 years of experience, 11% (n = 4) had 6–11 years of experience, 17% (n = 6) had 11–15 years of experience, 46% (n = 16) had 16–20 years of experience, and 17% (n = 6) had 21 or more years of experience. The participants taught across three groups: Elementary, middle and high school. Thirty-one percent (n = 11) of the participants teach at the elementary (K–6) grade band. Six percent (n = 2) of the participants teach in both the elementary (K–6) and middle school (7–8) grade bands. Thirty-four percent (n = 12) teach in the middle school (7–8) grade band. Twenty-nine percent (n = 10) teach in the high school (9–12) grade band. The participants were also asked to indicate their highest degree held. Twenty percent (n = 7) hold a bachelor's degree. Twenty-nine percent (n = 10) hold a master's degree. Forty-six percent (n = 16) hold a master's degree plus thirty. Five percent (n = 2) hold a PhD or EdD. A crosstabulation analysis of teaching experience across current teaching assignment levels was completed and presented in **Table 2**.

Table 2. Crosstabulation of teaching experience and current teaching assignment grade level.

Current Grade Level	Years of Teaching Experience				
	0–5	**6–10**	**11–15**	**16–20**	**21+**
Elementary (K–6)	2	0	1	8	2
Middle (7–8)	0	2	2	6	2
High (9–12)	1	2	3	2	2

Table 2 highlights the distribution and potential correlation between educators' years of teaching experience and their familiarity with working with instructional leaders. This information reveals that most teacher participants report having 16–20 years of teaching experience.

Participants were asked to indicate what leadership behaviors and actions influence their instructional decisions. This information is crucial to the study because it provides an understanding of how instructional leaders impact classroom instructional practices. **Table 3** illustrates what instructional behaviors impact teachers' classroom instruction.

Table 3. Teachers' perceptions of which instructional leadership behaviors impact classroom practices.

Instructional Leadership Behaviors	Percentage of Participants
Minimal or No Impact	26%
Support and Encouragement	22%
Feedback and Communication	16%
Modeling Leadership and Instructional Methods	13%
Autonomy and Risk-Taking	13%
Focus on Professional Development and Data Driven Instruction	10%

Table 3 shows that 26% (n = 8) of the participants feel that instructional leadership behaviors had little to no impact on their classroom practices and teacher self-efficacy. support and encouragement follow with 22% (n = 7), and feedback and communication with 16% (n = 5).

In comparison, **Table 4** details the teachers' perceptions of which instructional leadership behaviors impact teacher self-efficacy.

Positive reinforcement and praise are perceived to be the strongest instructional leadership behaviors, with 17% (n = 6) of participants identifying them as having the greatest impact on teacher self-efficacy. This is followed by Negative Leadership or Lack of Support, identified by 14% (n = 4) of participants, and Constructive Feedback, noted by 14% (n = 4).

Table 4. Teachers' perceptions of which instructional leadership behaviors impact teacher self-efficacy.

Instructional Leadership Behaviors	Percentage of Participants
Positive Reinforcement and Praise	17%
Negative Leadership or Lack of Support	14%
Constructive Feedback	14%
Trust and Autonomy	11%
Supportive Leadership	11%
Collaborative Leadership	11%
Inconsistent or Hands off Leadership	11%
Negative Feedback	11%

3.1. Q-sort results

Correlation matrix

The correlation matrix is a comparison or intercorrelation between each Q-sort [36]. **Table 5** represents the correlation between factor scores.

Table 5. Correlation between factor scores.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	-	0.50	0.50	0.42	0.13
Factor 2	-	-	0.38	0.35	0.11
Factor 3	-	-	-	0.40	0.30
Factor 4	-	-	-	-	0.04
Factor 5	-	-	-	-	-

The results showed most factors having moderate correlations between respondents, upholding distinguishing viewpoints from the participants' Q-sort. As indicated in **Table 5**, the highest association is between Factor 1 and Factor 2, and Factor 1 and Factor 3 (r =0.50), with a low association between Factor 5 and Factors 1, 2, and 5. The pattern of correlations suggests that while Factors 1, 2, 3, and 4 have some thematic overlap or shared dimensions, Factor 5 stands apart as the most independent factor. The moderate correlations among Factors 1, 2, 3, and 4 indicate the potential for shared conceptual underpinnings or interconnected elements in participants' responses, but their distinctiveness is preserved. Factor 5's low correlations with all other factors suggest it captures a unique perspective not shared by the majority of participants.

This analysis underscores the validity of a five-factor model, as it reflects a balance between interrelated yet distinct perspectives, with Factor 5 providing an outlier viewpoint that enriches the diversity of the model.

The 40 Q-sorts were intercorrelated, and factors were analyzed by extracting five centroid factors and a Varimax rotation of those five factors. Auto-flagging was set to $p < 0.05$, and a majority of common variance was required. Factor analysis determines which individuals can be grouped by demonstrating similar perspectives on a particular issue [36]. Continued analysis involved identifying and removing common

variance from the results to determine the variability and look for shared meaning in the data.

The quantum (Q) analysis was computed three times to ensure the optimal number of factors for participants with Q-sort extraction. The decision to select a five-factor solution over the six- and seven-factor models is grounded in the balance between variance explained and the practical interpretability of the factors, assessed through specific criteria for significant factor loadings. Significant factor loadings were determined based on a threshold value calculated using the formula $1.96 \times (1/\sqrt{N})$ where N represents the number of items in the Q-sort. This formula establishes the minimum loading required for statistical significance at the 0.05 level.

While the seven-factor and six-factor models each captured a higher percentage of variance (66%), they left a substantial number of participants (13) unaccounted for, failing to meet the criterion of significant factor loadings for these individuals. In contrast, the five-factor model, though explaining slightly less variance (57%), significantly reduced the number of participants not loading onto a factor to eight, meeting the significance threshold more consistently. This improvement in participant inclusion and factor clarity supports the selection of the five-factor model as the most prudent and fitting choice for this study.

A review of the characteristics of the five factors was then completed, shown in **Table 6**. The unknown category represents the five participants who did not complete the demographic or open-ended information of the study.

Table 6. Crosstabulation of current teaching level and factors.

	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Elementary (K–6)		2	4	2	
Middle School (7–8)	1	4	2	1	1
High School (9–12)	4		2	2	2
Unknown	2	1		2	

Table 7 provides years of teaching experience and the participant's factor loading.

Table 7. Crosstabulation of years of teaching experience and factors.

Teaching Experience	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
0–5	1		1		
6–10	1	2		1	
11–15	1	1	1		1
16–20		2	6	3	1
21+	2	1		1	1
Unknown	2	1		2	

Table 8 demonstrates a breakdown of the factor characteristics, including the number of defining variables, reliability coefficient, composite reliability, and standard error for each factor's z-score.

Table 8. Factor characteristics.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
No. of Defining Variables	7.00	7.00	8.00	7.00	3.00
Avg. Rel. Coef.	0.80	0.80	0.80	0.80	0.80
Composite Reliability	0.97	0.97	0.97	0.97	0.92
S.E. of Factor Z-Scores	0.19	0.19	0.17	0.19	0.28

As **Table 8** indicates, the factors have good reliability. The five-factor model resulted in seven defining variables in Factor 1, Factor 2, and Factor 4; eight in Factor 3; and three in Factor 5.

These five factors represent participants with similar perspectives on teacher self-efficacy. **Table 9** represents the eigenvalues ranging from the highest level of 12.29 to the lowest level of 2.00. The analysis indicated that 57% of the variance responses could be identified in the five factors.

Table 9. Eigenvalues.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Eigenvalues	12.29	3.06	2.85	2.69	2.00
% Explained Variance	31.00	8.00	7.00	7.00	5.00
Cumulative % Expln Var	31.00	38.00	45.00	52.00	57.00

The five factors exceed the acceptable 1.0 cutoff with eigenvalues of 12.29, 3.06, 2.85, 2.69, and 2.00. This supports the five-factor model as the most parsimonious model in representing the participants' perceptions of factors influencing teachers' sense of self-efficacy.

3.2. Varimax rotation

Factor rotation using Varimax rotation was employed in this analysis to optimize the interpretability of the factors. Varimax rotation is an orthogonal rotation method that maximizes the variance of squared loadings within each factor, allowing for a clearer distinction between factors by minimizing cross-loadings. This statistical technique reduces the complexity of the factor structure, ensuring that each variable aligns more strongly with only one factor while remaining uncorrelated with others [35]. This approach is particularly advantageous in Q-methodology, where the goal is to identify distinct viewpoints or shared perspectives among participants.

The Varimax rotation ensures that the Q-sort will have the highest possible factor loading for individual participants, thereby enhancing the clarity and reliability of the extracted factors. By aligning participant responses to a single dominant factor, this rotation method reduces ambiguity and provides a more precise depiction of the relationships among participants' sorting patterns.

In this study, 32 out of 40 participants loaded significantly into one of the five factors, meeting the threshold for significant factor loadings. Collectively, these five factors account for 57% of the variance, providing a balanced and interpretable model of the data. The remaining eight participants did not exhibit significant loadings on

any of the five factors, indicating that their responses did not align strongly with the extracted factors.

The themes were derived using a systematic approach to analyze participant responses collected through Q-sorts and open-ended survey questions. Initially, the Q-sort data were statistically analyzed to identify factor arrays, which grouped participants based on shared viewpoints and priorities regarding instructional leadership and teacher self-efficacy. Each factor array represented a distinct pattern of agreement and disagreement with statements, effectively clustering participants with similar perspectives.

Open-ended responses were reviewed to provide qualitative depth and context to the factor arrays. These responses were coded thematically using an inductive approach. Key phrases and recurring ideas were identified, categorized, and aligned with the quantitative factors. For instance, statements emphasizing creativity, student engagement, and individualized support were grouped under the theme "Sculptors of Curiosity and Creativity". Similarly, responses highlighting classroom management and family collaboration informed the theme "Orchestrators of Harmony and Growth".

The clarity provided by the Varimax rotation supports the thematic interpretation of the five factors. Factor 1 is referred to as Sculptors of Curiosity and Creativity. Factor 2 is referred to as The Orchestrators of Harmony and Growth. Factor 3 is referred to as The Champions of Potential and Possibility. Factor 4 is referred to as Architects of Confidence and Curiosity. Factor 5 is referred to as the Masterminds of Adaptability and Structure.

Table 10 presents the detailed Q-sort results for each participant after the Varimax rotation, with bold numbers and "X" indicating significant loadings in the appropriate factor column. This structured approach ensures that the analysis accurately reflects the distinct perspectives captured in the data.

Table 10. Factor matrix with an X indicating a defining sort.

Participant	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5	
0ZBJ	0.26		−0.03		−0.18		−0.12		0.61	X
1C8J	0.60	X	0.30		0.36		0.16		0.08	
3K0F	0.34		−0.08		0.33		−0.02		−0.19	
586N	0.18		0.56	X	0.18		0.09		−0.08	
5BIJ	0.39		0.15		0.27		0.60	X	−0.06	
62HJ	0.07		0.12		0.67	X	−0.13		0.21	
6JH1	0.55		0.19		0.54		0.17		0.27	
6OPM	0.22		0.66	X	0.11		0.34		0.08	
6ZIZ	0.43		−0.21		0.62	X	0.35		0.12	
8ERY	0.12		−0.07		0.26		−0.11		0.58	X
8EU1	0.81	X	0.29		0.05		0.19		0.33	
8TAL	−0.19		0.09		0.25		0.09		0.65	X
AN4L	0.72	X	0.33		−0.03		0.16		0.19	
BF20	0.28		0.40		0.61	X	0.20		0.07	
DLFU	0.26		0.35		0.46		0.40		0.49	

Table 10. (*Continued*).

Participant	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5
E8HI	0.18		0.24		0.52	X	0.09		−0.06
EKCQ	−0.22		0.27		0.01		−0.09		0.05
HA79	0.31		−0.04		−0.41	X	0.07		0.09
HB8R	0.06		0.05		0.31		0.81	X	−0.11
IFIK	0.03		0.62	X	0.09		−0.07		0.51
IJFD	0.13		0.23		0.46		0.37		0.48
IU2E	0.62		0.00		0.58		0.24		0.05
JR0I	−0.11		0.38		0.18		−0.48	X	−0.06
KP90	0.16		0.11		0.54	X	0.05		0.13
LQWU	0.51		0.36		0.13		0.20		0.30
NWJR	0.28		0.76	X	0.23		0.07		−0.02
P8FH	0.69	X	0.51		0.18		0.14		−0.09
PD1O	0.12		0.55	X	−0.09		0.40		0.30
QFTQ	0.61	X	0.14		0.25		−0.06		0.03
R8US	0.86	X	0.09		0.25		0.12		−0.13
R9CB	0.53		0.03		0.32		0.59		0.19
RG5T	0.34		0.07		0.03		0.73	X	0.02
T03X	0.16		0.40		0.20		0.63	X	−0.04
VP9T	0.04		0.49	X	−0.28		0.39		−0.11
W9ZZ	0.11		−0.01		0.16		0.66	X	−0.04
WFAX	−0.18		0.27		−0.28		0.51	X	0.08
XNPH	0.46		0.27		0.58	X	0.19		0.10
XSOC	0.65	X	−0.21		−0.03		0.33		0.07
Z8ER	0.05		0.05		0.64	X	0.31		0.16
Z8RL	0.07		0.49	X	0.20		−0.06		0.06

Note. X indicates a significant factor loading.

3.3. Factor arrays, identification, and interpretation

Q-methodology reflects the participants' perspectives and, for the current study, the participants subjective experiences with instructional leadership qualities and teacher self-efficacy. A factory array is a visual tool showing the participants' collective ideas. It does not represent any individual's remarks or views but rather is a collection of individuals who share similar ideas. In the following section, arrays will be provided to reach the five-factor models, identify the factor, and interpret the participant's point of view.

The integration of qualitative findings with Q-sort results was a pivotal aspect of this study, ensuring a comprehensive understanding of instructional leadership behaviors and teacher self-efficacy. The Q-sort methodology provided a structured, statistical framework to identify shared patterns among participant perspectives, while the qualitative findings offered deeper insights into these patterns through individual experiences and narratives.

Factor 1: Sculptors of Curiosity and Creativity.

The factor array for Sculptors of Curiosity and Creativity is shown in **Figure 1**.

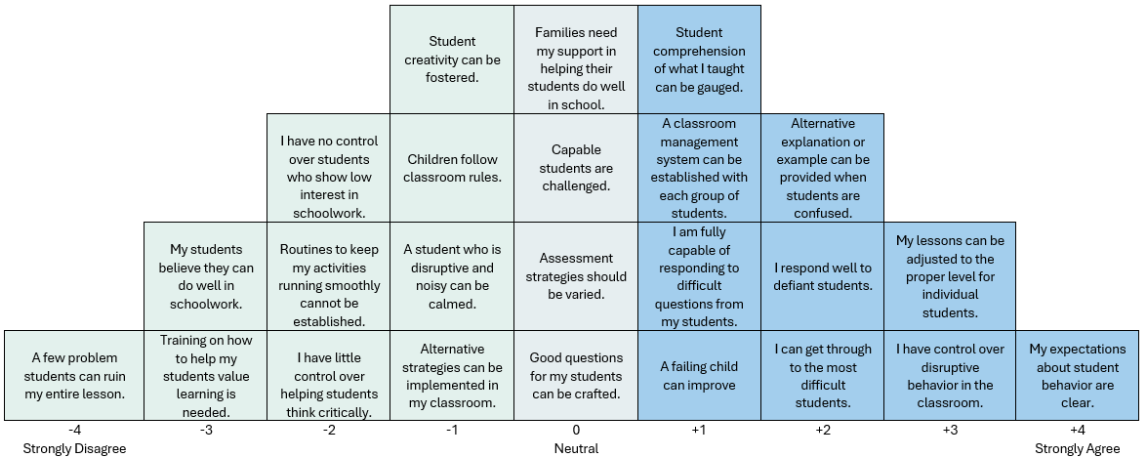

Figure 1. Model sort of teachers who loaded significantly on Factor 1: Sculptors of curiosity and creativity.

There are seven individuals statistically loading into this factor. The demographic and open-ended survey that was included in the study was completed by five of the Factor 1 participants. These educators ranged from novice to experienced, with two teaching experiences in the state of Ohio and three teaching experiences in Pennsylvania. Four of the participants currently teach in high school, and one teaches middle school. This group accounted for 17% of the study variance and has an eigenvalue of 12.29. **Table 11** lists the distinguishing statements for Sculptors of Curiosity and Creativity.

Table 11. Distinguishing statements for sculptors of curiosity and creativity.

No.	Statement	Endorsement
11	Good questions for my students can be crafted.	Neutral
12	Student creativity can be fostered.	Neutral
6	My students believe they can do well in schoolwork.	Neutral

Sculptors of Curiosity and Creativity General Viewpoint.

The Q-sort data highlighted a focus on fostering creativity and confidence among students. These priorities were substantiated by qualitative responses emphasizing the importance of posing thought-provoking questions and cultivating curiosity. This group of teachers sees themselves as artists shaping the minds of their students. They focus on asking the right questions, sparking creativity, and instilling a sense of confidence in students that they can succeed in school. These educators believe that with the right touch, curiosity blooms into knowledge and creativity fuels deeper understanding.

When prompted to reflect on instructional leadership behaviors that impact classroom practices and self-efficacy, participants QFTQ and XSOC stated that instructional leaders can best impact their classroom practices through using research-based strategies and personal data to support their practices. Participant XSOC noted, “Instructional leaders inspire us to think outside the box, encouraging strategies that spark curiosity in students.” Participant P8FH stated encouragement, positive support,

and creativity are the behaviors that have an impact on self-efficacy, stating, "Encouragement and creativity are essential; our leaders model this, which motivates us to do the same in our classrooms".

Factor 2: The Orchestrators of Harmony and Growth

The factor array for The Orchestrators of Harmony and Growth is shown in **Figure 2**.

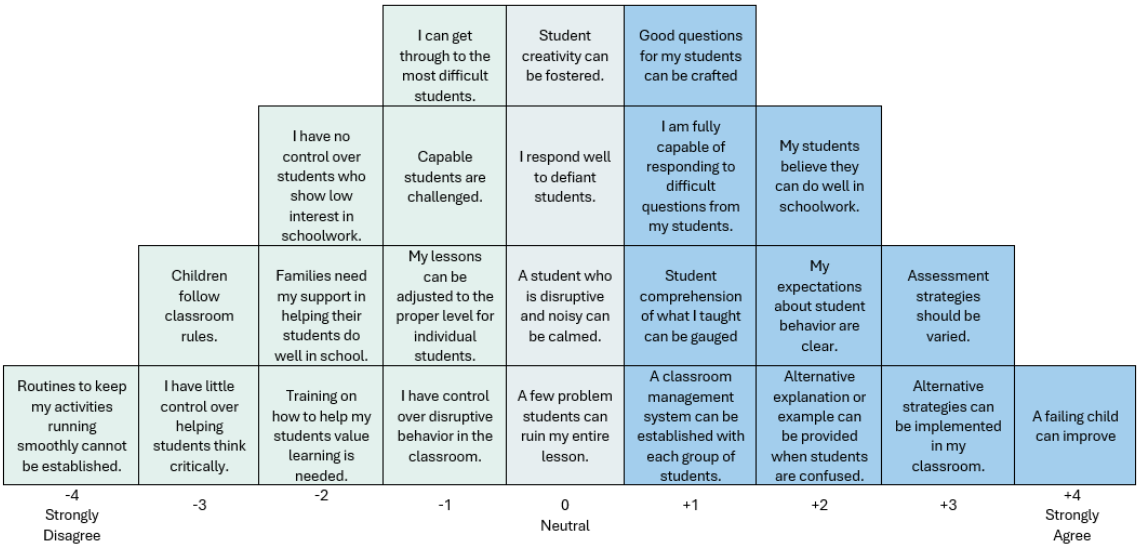

Figure 2. Model sort for teachers who loaded significantly on Factor 2: The orchestrators of harmony and growth.

There are seven individuals statistically loading into this factor. The demographic and open-ended survey that was included in the study was completed by six of the Factor 2 individuals. Six of the educators teach in Pennsylvania. Two currently teach in the elementary grade band and four teach in the middle school grade band. The teachers who loaded into this factor are more experienced and range in teaching experience from six to over 20 years. This group accounted for 18% of the study variance and had an eigenvalue of 3.06. **Table 12** lists the distinguishing statements for Factor 2: The Orchestrators of Harmony and Growth.

Table 12. Distinguishing statements for the orchestrators of harmony and growth.

No.	Statement	Endorsement
3	I have control over disruptive behavior in the classroom.	Positive
21	I respond well to defiant students.	Positive
18	Assessment strategies should be varied.	Neutral
22	Families need my support in helping their students do well in school.	Neutral
9	Training on how to help my students value learning is needed.	Neutral
6	My students believe they can do well in schoolwork.	Neutral
19	A few problem students can ruin my entire lesson.	Negative

The orchestrators of harmony and growth general viewpoints.

Participants associated with this factor prioritized classroom management and student growth. Their qualitative responses reinforced this, as they frequently discussed the role of instructional leaders in creating structured environments and

providing clear, supportive guidance. These teachers are maestros conducting the symphony of learning. They skillfully balance classroom management, respond to challenging behaviors, and adapt assessment strategies like varied musical notes. They also recognize that family support plays an essential role in student success. Their approach is about orchestrating harmony in the classroom while guiding individual student growth with precision and care.

When prompted to reflect on instructional leadership behaviors that impact classroom practices and self-efficacy, participant PD1O stated, "Leaders set the tone by being clear in their expectations and providing the guidance we need to maintain harmony in our classrooms." This suggests that instructional leaders impact classroom practice by being clear in goal setting and being a source of guidance and support when needed. Participant Z8RL stated, "To increase self-efficacy, leaders should encourage us to try new things while supporting us every step of the way". Suggesting that to increase teacher self-efficacy, instructional leaders must foster confidence, be supportive and caring, and encourage educators to try new activities and learning opportunities.

Factor 3: Champions of Potential and Possibility.

The factor array of Champions of Potential and Possibility is shown in **Figure 3**.

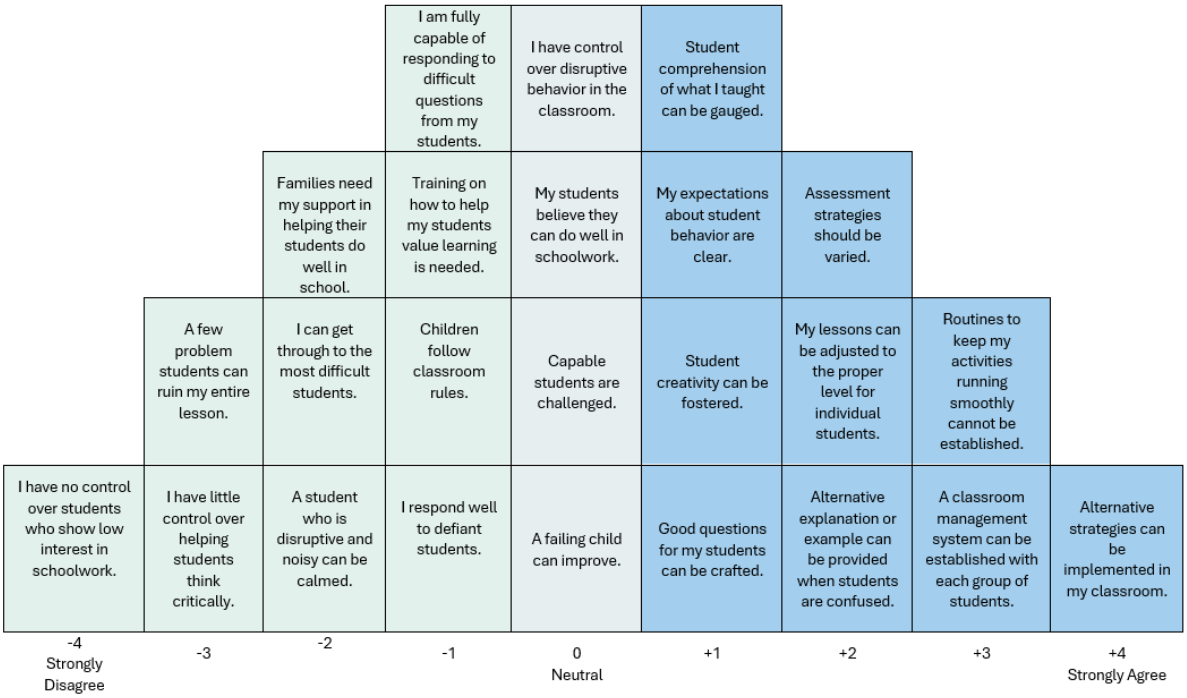

Figure 3. Model sort for teachers who loaded significantly on Factor 3: Champions of potential and possibility.

There are eight individuals who statistically load into this factor. One participant teaches in Ohio while the other seven teach in Pennsylvania. Four participants currently teach the elementary grade band, two teach in middle school, and two teach at the high school. One participant has 0–5 years of experience, one has 11–15 years of experience, and six have been teaching 16–20 years. This group accounted for 20% of the study variance with an eigenvalue of 2.85. **Table 13** lists the distinguishing statements for Factor 3: Champions of Potential and Possibility.

Table 13. Distinguishing statements for champions of potential and possibility.

No.	Statement	Endorsement
14	A failing child can improve.	Neutral
6	My students believe they can do well in schoolwork.	Neutral
15	A student who is disruptive and noisy can be calmed.	Neutral

Champions of Potential and Possibility General Viewpoints.

The Q-sort revealed an emphasis on belief in student potential, which was echoed in qualitative comments about fostering resilience and addressing disruptive behaviors. In this theme, teachers are relentless believers in the power of change. They champion the idea that every failing student can turn things around and that disruptive behaviors can be soothed. These educators nurture a belief that, with the right support, even the most challenging students can rise. Their classroom is a safe space where potential thrives, and obstacles are opportunities.

When prompted to reflect on instructional leadership behaviors that impact classroom practices and self-efficacy, participant Z8ER stated, "Patience and calmness from instructional leaders set an example for how we can approach our most difficult students". Participant 6ZIZ added, "Positive feedback and encouragement from leaders help us believe in our own ability to bring out the best in every student".

Factor 4: Architects of Confidence and Curiosity.

Figure 4 demonstrates the factor array of Architects of Confidence and Curiosity.

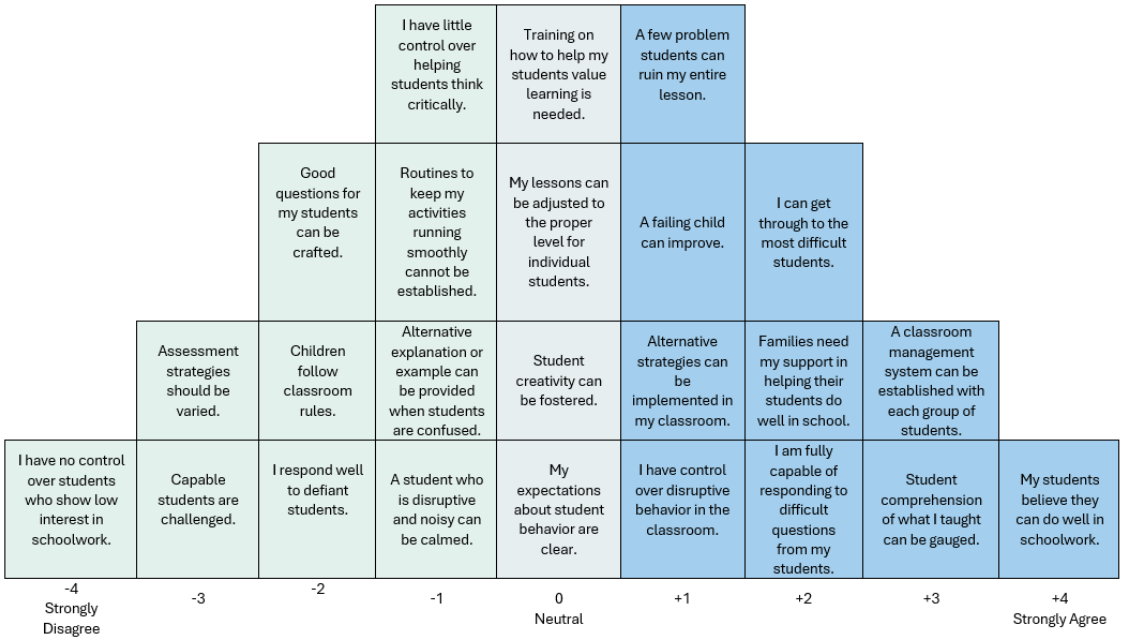

Figure 4. Model sort for teachers who loaded significantly on Factor 4: architects of confidence and curiosity.

Seven participants statistically loaded into this factor. Two participants did not complete the demographic or open-ended portion of the study. Four participants teach in Pennsylvania, and one teaches in Ohio. Two teach at the elementary grade band, one teaches in middle school, and two teach in high school. One teacher has 6–10 years of experience. Three teachers have 16–20 years of experience, and one has more than 21 years of experience. This group accounted for 18% of the study variance and

had an eigenvalue of 2.69. **Table 14** lists the distinguishing statements for Factor 4: Architects of Confidence and Curiosity.

Table 14. Distinguishing statements for architects of confidence and curiosity.

No.	Statement	Endorsement
8	Routines to keep my activities running smoothly can not be established.	Negative
11	Good questions for my students can be crafted.	Neutral
6	My students believe they can do well in schoolwork.	Neutral
7	I am fully capable of responding to difficult questions from my students.	Positive

Architects of Confidence and Curiosity General Viewpoints.

Teachers in this group emphasized confidence and strategic questioning in their Q-sort rankings. This focus was mirrored in their qualitative responses, which described instructional leaders as providers of professional development opportunities and as supporters of reflective, research-driven practices. Teachers in this group are architects, building strong foundations for learning. They have confidence in their ability to guide students through tough questions and design smooth-running routines. They approach teaching with the mindset that every challenge is a blueprint waiting to be mastered, and they lay down the bricks of curiosity, one thoughtful question at a time.

When prompted to reflect on instructional leadership behaviors that impact classroom practices and self-efficacy, participant 5BIJ stated that instructional leaders provide professional development opportunities and support when it comes to implementing instructional strategies, saying, “Our leaders provide the tools and training we need to implement strategies effectively, which boosts our confidence in handling challenging situations”. Participant RG5T believes instructional leaders who are committed to researching and supporting initiatives they implement increase teachers’ sense of self-efficacy, saying, “Leaders committed to researching and supporting initiatives inspire us to approach teaching with curiosity and confidence”.

Factor 5: Masterminds of Adaptability and Structure.

Figure 5 represents the array of Masterminds of Adaptability and Structure.

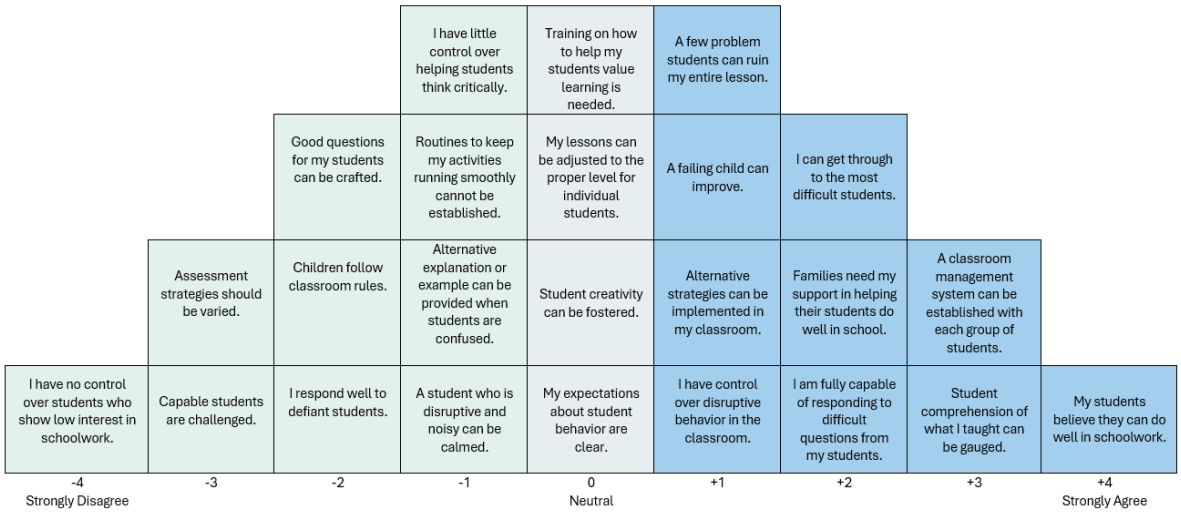

Figure 5. Model sort for teachers who loaded significantly on Factor 5: Masterminds of adaptability and structure.

There are three individuals who statistically load into this factor. Two participants teach in the state of Pennsylvania, and one teaches in Ohio. Two participants teach at the high school level, while one teaches at the middle school level. One participant has 11–15 years of teaching experience, one has 16–20 years of teaching experience, and one has over 21 years of teaching experience. This group accounted for 8% of the study variance and has an eigenvalue of 2.00. **Table 15** lists the distinguishing statements for Factor 5: Masterminds of Adaptability and Structure.

Table 15. Distinguishing statements for masterminds of adaptability and structure.

No.	Statement	Endorsement
6	My students believe they can do well in schoolwork.	Neutral
3	I have control over disruptive behavior in the classroom.	Positive
20	An alternative explanation or example can be provided when students are confused.	Neutral
11	Good questions for my students can be crafted.	Neutral
18	Assessment strategies should be varied.	Neutral

Masterminds of Adaptability and Structure General Viewpoints.

Adaptability and control were central to this factor, and the qualitative responses elaborated on how instructional leaders facilitated this balance. These educators are flexible strategists who thrive on adjusting their approach to meet the needs of their students. They are the type who can easily switch gears, offering alternative explanations when students are confused while still maintaining control over classroom dynamics. For them, the balance between structure and adaptability is key to ensuring discipline and dynamic learning.

When prompted to reflect on instructional leadership behaviors that impact classroom practices and self-efficacy, participants 0ZBJ and 8TAL state that instructional leaders impact their classroom practices minimally. Participant 0ZBJ commented, “Constructive feedback from leaders helps us refine our methods to meet the diverse needs of students”. Participant 8ERY believes that to increase teacher self-efficacy, instructional leaders need to better provide constructive feedback as well as provide better support and encouragement, stating, “Strong support from leaders enables us to balance adaptability with structure, ensuring both flexibility and discipline in the classroom”.

3.4. Outlying participants

Eight of the participants did not significantly load into one of the study’s factors. These participants had perceptions that did not fit well with the five main factors that were extracted from the Q-sort. However, they did respond to the open-ended questions and were included in the analysis of those responses. Three of the participants expressed that they feel their instructional leaders have little to no impact on their classroom practices. These teachers feel that their instructional leaders lack execution of relevant feedback, support, and guidance, which negatively impacts their self-efficacy. The remaining five participants feel that their instructional leaders encourage, support, and model strategies that impact their classroom behaviors. These teachers also feel that their instructional leaders positively impact their sense of self-

efficacy by providing opportunities for professional development and leadership growth.

4. Discussion

This study explored how instructional leadership qualities influence teacher self-efficacy and classroom practices. The findings identified six key leadership behaviors that teachers perceive as most impactful: Positive reinforcement and praise, support and encouragement, constructive feedback, modeling leadership and instructional methods, trust and autonomy, and collaborative leadership. These qualities collectively foster teacher confidence, instructional improvement, and professional growth, underscoring the critical role of instructional leaders in creating supportive learning environments.

4.1. Key instructional leadership qualities

Teachers emphasized the importance of positive reinforcement and praise in boosting motivation and confidence, while support and encouragement created a foundation for professional growth and security. Constructive feedback emerged as another essential quality, providing teachers with actionable insights to refine their instructional methods and promote a growth mindset. Modeling leadership and instructional methods proved significant in building teachers' confidence, as principals who demonstrated best practices offered practical examples for teachers to emulate. Trust and autonomy were particularly valued by secondary teachers, who appreciated the freedom to innovate and adapt strategies to meet their students' needs. In contrast, elementary teachers prioritized collaborative leadership, where teamwork and shared learning fostered confidence and instructional success.

4.2. Elementary vs. secondary teachers' perspectives

Notable differences emerged between elementary and secondary teachers' perceptions of leadership qualities. Elementary teachers valued supportive and collaborative leadership that provided clear guidance, professional development, and opportunities to work collectively. Secondary teachers, however, emphasized the importance of trust and autonomy, which allowed them to make instructional decisions and explore innovative teaching practices. These distinctions highlight the need for tailored leadership approaches that address the unique needs of teachers at different educational levels to maximize their effectiveness and enhance self-efficacy.

4.3. Impact on classroom instruction and self-efficacy

The impact of these leadership qualities on classroom instruction and teacher confidence was significant. Positive reinforcement and support motivated teachers to experiment with new strategies, while constructive feedback and modeling leadership promoted continuous improvement in teaching practices. Trust and autonomy empowered teachers to take ownership of their instructional decisions, fostering innovation and adaptability. Collaborative leadership built a supportive culture where teachers could share ideas and work toward shared goals. Together, these qualities

enhanced teacher self-efficacy, strengthened instructional practices, and ultimately contributed to improved student outcomes.

4.4. Context and implications

The findings of this study align with Bandura's Social Cognitive Theory, which emphasizes the interaction between individuals' beliefs and their environments. By understanding teachers' perceptions, instructional leaders can better address their needs, creating environments that encourage growth and professional development. For school leaders, this means prioritizing praise, constructive feedback, and autonomy to empower teachers while leading by example to demonstrate best practices. Policymakers can support professional development programs that emphasize collaboration, trust-building, and feedback mechanisms. Educators themselves can advocate for supportive leadership and engage in continuous learning to enhance their instructional skills.

4.5. Limitations and future directions

While the study offers valuable insights, it is not without limitations. The small sample size and regional focus on Pennsylvania and Ohio restrict the generalizability of the findings. Additionally, reliance on self-reported data introduces potential biases, and the cross-sectional design limits the ability to assess long-term impacts. Future research should expand sample sizes, incorporate longitudinal methods, and explore contextual factors such as school culture and socioeconomic influences to provide a more comprehensive understanding of instructional leadership's effects on teacher self-efficacy.

5. Conclusion

This study was able to connect the statistical rigor of Q-sort results with the rich, descriptive depth of qualitative data, offering a holistic view of how instructional leadership behaviors shape teacher self-efficacy. The study highlights the importance of instructional leadership qualities such as praise, support, constructive feedback, modeling, trust, and collaboration in enhancing teacher self-efficacy and classroom practices. The differences between elementary and secondary teachers underscore the need for tailored approaches that address specific educational contexts. By fostering professional growth and empowering teachers, instructional leaders can ultimately create positive learning environments that benefit both educators and students.

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Institutional review board statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Youngstown State University IRB (protocol code 2025-005 on 11 July 2024)." for studies involving humans.

Informed consent statement: Informed consent was obtained from all subjects involved in the study, per the YSU IRB guidelines.

Conflict of interest: The authors declare no conflict of interest.

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