Principle leadership and student collaboration may be linked via the collective effectiveness of teachers as a mediator

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Abstract

Students, teachers, and schools all benefit from teacher cooperation, according to empirical data. There are several ways in which school administrators may encourage and promote teacher cooperation, and principals are in the best position to influence this. “It was suggested that teachers' collective efficacy acts as a mediator between principal leadership and teacher cooperation, according to social interdependence theory.” Structural Equation Modelling revealed “that principal leadership had a substantial indirect influence on teacher cooperation, mediated through teachers' collective efficacy, in 29 elementary and secondary schools.” These findings have important implications for assisting school development.

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Introduction

There are several benefits to teacher cooperation, including better student results for both students and teachers, as well as better school outcomes for everyone. Helps instructors cope with pressures and psychological strains, promoting student accomplishment as well as strengthening a school's potential to develop. The role of the principle, one of numerous school administrators, is to manage the school's workforce and establish a healthy school atmosphere. So they're more equipped to encourage and facilitate collaboration among teachers in their schools. “By providing teachers with regular and adequate time for collaboration, and by fostering teachers' desire to work together, principals may encourage teachers to cooperate in their schools.” In order for a cooperative endeavour to be successful, everyone involved must have faith in the group's capabilities. Boosting teachers' belief in the collective efficacy of their team (i.e., their belief in the group's ability to deal with difficult situations) is one way principals may encourage collaboration among their staff.

Teachers' collaboration and collective efficacy are closely linked to the “effectiveness of principle leadership, according to many research studies, leadership by principals” has found to be an indicator of both the number and quality of teacher cooperation in school districts. “Findings on the link between principal leadership and teachers' collective efficacy have been contradictory too far, while some studies have revealed a statistically significant link between principal leadership and the collective efficacy of teachers.”

Two critical "components of the link between principal leadership and teacher cooperation have not been adequately researched in recent studies." First, research has examined the link "between principal leadership and teachers' individual self-efficacy, but few have examined the drivers of teachers' collective efficacy, even though this is regarded a key predictor of teacher collaboration." As a "second point, most research to date have concentrated on the effect of teacher cooperation on teachers' (self)efficacy, ignoring the reciprocal benefits of this collaboration." Teachers' collective efficacy is examined as a predictor of collaboration, not a criterion, in this study based on organizational psychology's understanding of social interdependence as a precondition for cooperation.

Teachers' collective effectiveness and their collaborative behaviour are examined in this study. In our study, "we hypothesize that collective efficacy mediates the connection between principle leadership and teacher cooperation, this study begins by outlining our theoretical assumptions about principle leadership and the connections between principal leadership, teacher efficacy, and teacher cooperation." Then we describe our empirical findings. A discussion of the research methodology and findings follows.

Framework for understanding principal leadership in a school

There has been a lot of study done on the subject of teacher leadership throughout the years. According to a number of studies, school principals have been analysed in terms of a certain type of leadership paradigm, such as instructional leadership or transformational leadership. In order to establish "theoretical assumptions on the linkages between leadership practices, collective efficacy of teachers, and teacher cooperation, we first briefly summarize the two primary models of principal leadership mentioned in the literature." As a theoretical context for this study's major leadership, this comparison is complete.

As a first paradigm of leadership, transformational leadership was developed in the 1970s by organizational researchers. "Employee engagement is defined as the degree to which an organization's employees are invested in helping the organization achieve its objectives." Transformational leaders pay "special attention to each workers so they feel uniquely valued (individualized consideration) and inspire their employees to think creatively and innovatively about the future of their firm (intellectual stimulation)." As a result of their "inspirational motivation," they are able to "convey optimism and high aspirations (inspirational motivation)" (idealized influence). "Leadership in educational organizations (e.g., schools) is the emphasis of instructional leadership, which comprises all leadership efforts focused at increasing teaching quality and student academic achievement." It is the responsibility of instructional leaders to set specific and time-bound goals for the whole school community. "They oversee and assess education, manage the curriculum, and monitor pupils' academic progress. In addition, instructional leaders safeguard instructional time, encourage professional development (PD) of employees, and give incentives for teaching and learning."

Both "transformative and instructional leadership have been criticized for two reasons. Instructional and transformational leadership are linked" constructs that share certain elements, such as high standards, a clear vision, and intellectual staff development stimulation (Polatcan et al. 2021) Moreover, "the conventional major gap between the two leadership methods is blurring—with instructional characteristics embedded in transformational leadership and teacher development components in instructional leadership." Empirical scholars should study various leadership approaches. Instead of considering various leadership styles as a starting point, empirical researchers should examine principals' real work and its effects, according to some.

In this research, "we examine principal leadership in terms of instructional and staff development, Principal leadership is a kind of coexisting and integrated leadership because it combines transformational (such as intellectual

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stimulation for staff development) and instructional leadership (e.g., supervising and evaluating instruction).” German school leaders must ensure teachers' and administrators' professional advancement. The following sections provide theoretical theories and empirical evidence on principals' genuine “leadership practices and their connection to teacher collective effectiveness and collaboration.”

Teachers and principals must work together

As a result, the working circumstances of teachers are shaped by “the organizational and cultural surroundings of their schools, providing chances for teachers to collaborate with their colleagues is one way that principals set the general environment for teacher cooperation.” By building “an environment of mutual trust and including teachers in decision-making processes,” leaders may encourage teacher cooperation. For the sake of student learning, principals should encourage their instructors to collaborate with one another (e.g., Goddard, et al. 2021).

Collaboration in schools “is defined as a group of instructors working together to achieve a common objective, each with their own autonomy, and trusting one another.” Confidence in the group's ability to work together to resolve problems is a component of group-related trust (Triana, et al. 2021).

Research from the Netherlands and the United States shows a correlation between “principle leadership and teacher cooperation.” In example, “research from the country demonstrated a link between teacher cooperation and principle leadership in circumstances where principals provided the frameworks necessary for teacher collaboration, such as by assigning time slots for collaboration or supporting teacher interaction (e.g., by appreciating teachers who work together).” Study results show that it's not enough for administrators to just give mechanisms for teachers to collaborate, but that they should "establish a culture of shared vision, purpose, and goals, in order to foster interdependence and collective accountability within teams". Teachers' collective efficacy is linked to principle leadership because of their interdependence and collective accountability, which we shall explore in more detail in the next section.

Teachers working together to achieve more efficiency and effectiveness

Individual interactions provide collective effectiveness, which is a property of groups. People's self-efficacy and collective ideas on a group's potential come together in this notion. As a motivating attribute “in schools, collective efficacy may be viewed as instructors' subjective evaluations of their overall teaching success, teachers' opinions of their collective capacity to use their resources in dealing with tough or challenging situations, as well as creating and enriching effective learning environments, may be described as a measure of collective efficacy, Self-efficacy is defined by Bandura as the ability to believe in one's own abilities.” Both the individual's prior achievements and failures (their own mastery experience) and those of the other members of the group are included in this category (along with those of the whole group) (vicarious experience). People's perceptions of their collective potential to accomplish future goals are shaped by their collective emotional states and feedback about previous group successes (social persuasion). In contrast to popular belief, teachers' self-perceptions of collective efficacy may be influenced by elements closer to home, such as the physical and social environment at which they work and learn in schools (Donohoo, et al. 2020). “perceived group competence”. "Teachers are necessarily impacted by the collective to which they belong; yet, at the same time, they shape the perspective of the collective potential of the school," he writes.

Efficacy in the classroom increases when teachers work together, according to study. A study of Dutch schools' social networks found that the number of ties between instructors (as compared to the maximum number of relationships conceivable) predicted the collective effectiveness of those teachers. When teachers work together in networks like this, they learn from one another and build stronger bonds on and off the job, which benefits both

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their personal and professional lives. It has been shown "that teachers' collective efficacy is mediated by teacher cooperation in another study from the United States." According to theories of socio-cognitive learning, instructors can work together in groups to achieve mutually aligned goals by creating scenarios where students compare themselves to their peers and so get "ideas about the potential of the entire group," according to the authors. It discovered that the idea of collaborative efficacy is bolstered by experiences of cooperative success, whereas failures detract from this.

According to socio-cognitive theories, teacher cooperation is a characteristic "that predicts teachers' collective efficacy." However, "this study relies on ideas from organizational psychology that focus on social interdependence" (Lagios, et al. 2022). "We presume that if people" believe that other members of the group are capable of accomplishing their own goals, they would view collaboration as advantageous to their own personal objectives. "Individual conviction in a group's potential is therefore a precondition for social interdependence and, therefore, collaboration." In empirical research from the Netherlands and South and Central America, social interdependence has been highlighted as a precondition for effective collaboration. According to research, instructors are more inclined to form collaborative connections and work together more frequently if they see the value in doing so. We may use teachers' collective efficacy to gauge the school's overall confidence in their own talents.

Principals' and teachers' cooperation: the role of group effectiveness as a mediating factor

To ensure that teachers have the greatest possible working environment, school principals have the power to establish and control their school's work circumstances. "Teachers' individual and collective self-efficacy and collaborative conduct are both positively impacted by the leadership of principals, according to empirical studies." During the course of this investigation, "we will offer theoretical assumptions and empirical data on the connections between principal leadership in instructional development and staff development with teachers' collective effectiveness and teacher cooperation, instructional leadership encompasses all efforts targeted at enhancing the quality of education, and instructional development can be regarded one of such activities (conducting classroom visits, defining standards for instructional quality)." Principals who participate in this type of activity can help instructors improve their instruction. Teachers' collective efficacy will be enhanced if they adapt their instruction in response to feedback and, as a result, achieve personal success (or see the success of their peers). Teachers can better understand their own strengths and limitations when their administrators undertake "classroom visits or encourage peer observation and personal feedback." In addition, we expect that instructors who have faith in their leader's ability as an educator would contact their principal more frequently with concerns and requests for help. It all helps instructors deal with "challenging professional situations and boosts their conviction in their own talents and those of their entire teaching team."

Unlike professional development for teachers, "staff development entails all of the efforts a principal undertakes to help instructors improve their abilities, providing teachers with intellectual stimulation (encouraging them to participate in professional development) and personalized consideration is an aspect of transformative leadership (addressing professional needs of school staff)." "When school leaders help teachers build their professional abilities, they have a direct impact on the development of teachers' personal competences and beliefs." Our assumption is that principals "who conduct staff development activities in their schools consistently improve the percentage of staff with suitable abilities and, thus, the likelihood of teachers experiencing group-level mastery experiences and vicarious experiences as well as group competence."

Administrators may encourage "teachers to reflect on their classroom practices" by providing them with high-quality professional

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development programs. Administrators who create work environments where teachers may utilize "their acquired skills in the classroom boost their workers' mastery experiences." Principals' thorough staff assessments may boost teachers' collective effectiveness. Principals (and other school administrators, such as mentor teachers) are required to provide instructors thorough feedback on their previously stated objectives during staff evaluations. This motivates teachers to work harder and improve. "It also helps educators analyse their own work for strengths and weaknesses, therefore, a continual process of goal-oriented (process-and-product-oriented) and data-driven interviews (e.g., based on classroom observations) must incorporate individual and school improvement plans into staff evaluations" (Baco & Elihami, 2021). All of these tactics may increase the school staff's performance and the instructors' judgments of their own individual and collective effectiveness, "since collective efficacy is based on personal experiences and the group's capacity to accomplish future tasks."

Leadership and teachers' collective effectiveness haven't been consistently studied. Researchers have found a link between teachers' collective effectiveness and professional development activities, whereas other research has not (Karacabey, et al. 2022). Employee training outcomes vary widely. Administrators may "boost teachers' self-efficacy by encouraging them to reflect on their own performance, applauding them, and listening to their concerns, secondary school teachers had a somewhat significant association between principal leadership in staff development and collective effectiveness, whereas Chinese teachers did not." Germany hasn't examined "the relationship between principal leadership and teacher collective effectiveness, one study identified a relationship between transformative leadership and teachers' self-confidence, her research indicated a small but statistically significant influence for personalized consideration but no relationship between intellectual stimulation and teachers' self-efficacy." German study on principal leadership and teacher motivation has focused on work satisfaction, dedication, and well-being. No scientific evidence links principal leadership to teachers' collective effectiveness.

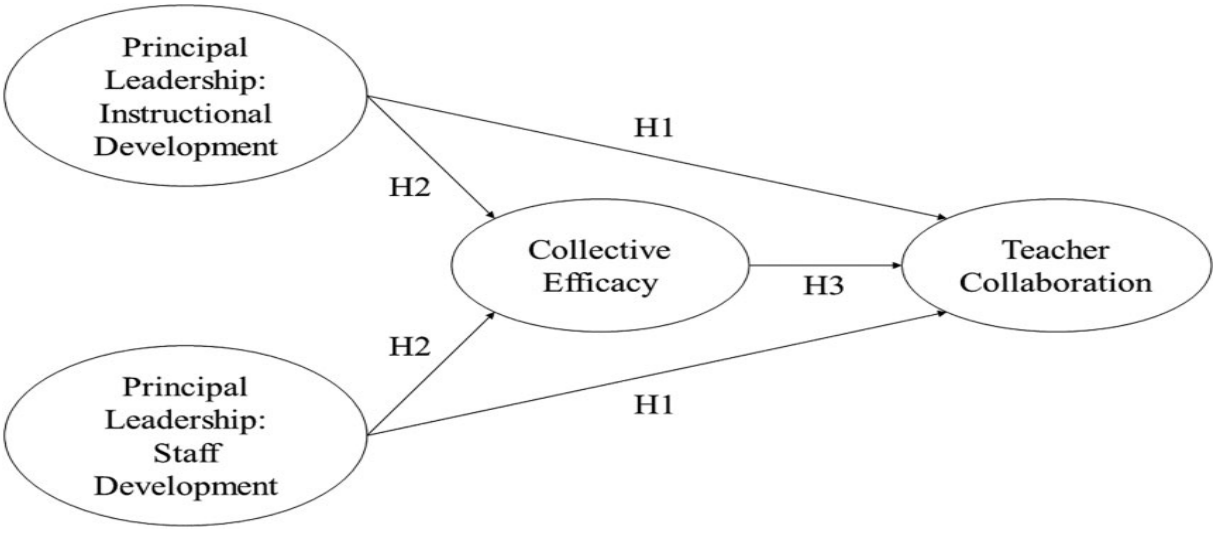

Figure 1. Principal leadership model for instructional and staff development, teacher efficacy, and cooperation.

Research question

Teachers are more likely to collaborate with peers if they are confident in the talents of their co-workers, according to our research. Teachers and instructional quality may be improved by principals, who may be able to encourage this idea by focusing on improving their own abilities. Teachers are more likely to feel competent if their administrators, for example, set clear goals for them to work toward and/or offer them with regular feedback. So, let's talk about the following

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issues: “Do administrators' instructional and personnel development approaches predict teacher collaboration? Is this link mediated by the collective efficacy of teachers? Figure 1 depicts the model that was proposed.”

Using the conditions outlined by (Adigwe, 2021), the following hypothesis may be formulated:

H1: Effective leadership by principals “:in terms of staff development and student” achievement is linked to increased teacher cooperation.

H2: Teachers' collective efficacy is favourably correlated with “principal leadership in terms of instruction or staff development.”

H3: “The effectiveness of teachers'” collaboration is predicted by their collective efficacy. Teachers' collective efficacy is high.

H4: “Teacher efficacy is a mediating factor in the link between principal leadership and student cooperation.”

Components and procedures

Sample

630 instructors from seven elementary schools, “15 secondary schools, and seven upper secondary schools in a federal state in Germany were surveyed for this study, during an 18-month professional development program for principals, two members of the school leadership team and the teachers at the participating schools provided data for an evaluation.” The principals agreed to participate in the professional development program. After the first two months of the PD program, researchers gathered data on the participants' feelings on the program's content. The average percentage of teachers who responded was 60.0 percent across all schools. There were 62.4 percent of the participants who were women, and 48.7 percent of the participants who had worked in the field of education for more than 12 years.

Instruments

Teaching and staff development leadership approaches were surveyed by teachers. Teacher evaluations on “their principals' participation in activities aimed at enhancing instruction were requested as part of a study on instructional development (e.g., The principal ensures that a common understanding of instructional quality exists at our school).” Several different instruments provided the inspiration for the scale's five components. Staff development strategies were founded on principals' commitment to “supporting and increasing teachers' professional abilities (e.g., The principal gives our teachers frequent feedback on how they are developing.).” Five existing instruments were used to measure this scale (Van Jaarsveld, et al. 2019). (Bajcar & Babiak, 2022). Every single item was scored out of a possible “four on the Likert scale (4 strongly disagree to 4 strongly agree).”

Our selections for principle responsibilities in Germany were informed by research into German legislative documents, which revealed that principals are legally required to facilitate teacher cooperation and carry out activities related to staff development and instruction “(e.g., supporting teaching staff in dealing with pedagogical issues, conducting classroom observation), teachers' opinions of their principals' leadership techniques were recast because the original instruments were produced in English and focused on principals' self-assessment.”

ICC (1) and ICC (2) intra-class correlations were determined because of the layered data structure to determine “the scales' reliabilities at the individual and group levels.” The ICC(1) shows how much of the overall variation can be attributable “to differences between schools, whereas the ICC(2) shows how reliable the group mean is at the school level.” An ICC(1) of at least 0.10 and an ICC(2) of at least 0.80 are necessary for a valid measurement. Each scale's reliabilities are listed in Table 1. The results of both the educational and staff development efforts were positive.

Table 1. “Information on the model fit of all variables.”

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	df	χ^2	"GAMMA"		CFI	SRMR	ICC(1)	"ICC(2)"
"Instructional development"	5	46.64**	0.99		0.95	0.04	0.19	0.88
"Staff development"	5	39.75**	0.99		0.99	0.03	0.25	0.91
"Collective efficacy"	2	36.28**	0.99		0.97	0.04	0.23	0.90
"Teacher collaboration"	2	9.91**	1.00		0.96	0.03	0.25	0.91

"df: degrees of freedom; GAMMA: gamma hat; CFI: comparative fit index; SRMR: standardized-root-mean-square residual; ICC: intra-class correlations, $^{**}p < 0.001$."

A tool was used to assess the group's overall efficacy. With this measure, instructors were asked to rate their collective capacity to handle tough situations and meet "their goals (e.g., I believe in the ability of our staff to implement innovations even in difficult situations.), teachers were once again asked to score the issues on a Likert scale of 1 to 4, with 1 denoting strong disagreement and 4 denoting strong agreement." Teachers were asked to rate the frequency with which they engage in various types of cooperation at two distinct levels when it came to teacher collaboration. There was a mix of articles that discussed simple types of cooperation among colleagues, such as exchanging information and teaching materials, and more advanced "forms of collaboration (e.g., teaching a class together as a team)." As part of the evaluation process, teachers were assessed on a four-point scale based on the frequency with which they collaborated with one another. A German translation of the items used to assess cooperation was made. Both scales were found to be reliable (see Table 1).

Analysis

"Structural equation modelling was utilized to analyse the postulated model's linkages (see Figure 1)." Descriptive statistics, correlations, and other statistical analyses were carried out with the help of IBM SPSS Statistics 25. Using Mplus 8.2's full information maximum likelihood technique, the model was estimated without replacing or imputing missing variables. It was assumed that instructors would evaluate their principals' leadership, however the results showed that there was a multi-level system. "As the sample comprised of numerous groups of instructors from various schools, we compensated for the nested structure of the data by utilizing the school code as a cluster variable." Type complex algorithms were also employed.

First, we examined whether all variables were "latent for each construct (instructional and staff development, collective efficacy of teachers, and teacher cooperation)." Table 1 displays fit statistics for four estimation models. Gamma Hat, CFI, and SRMSR were used to evaluate model fit (SRMR). Due of RMSEA's sensitivity to small degrees of freedom models, we used GAMMA (df). "GAMMA 0.95, CFI 0.90, and SRMR 0.08 "were employed for model fit (Savalei, 2021). All variables matched. In the studies, "instructional and staff development (r = 0.67)" were combined into a single factor for principal leadership.

We generated "a number of structural equation models and provided the standardized route coefficients in order to study our research concerns." To detect a mediation effect, the following requirements must be met (see Leech, 2022). There is a substantial connection between the dependent (cooperation among teachers) and independent variables (Hypothesis 1), which indicates that the mediation has a direct impact, "principal leadership (hypothesis 2) and teacher cooperation (hypothesis 3) must have statistically significant correlations in order to have an indirect influence." Teachers' collective efficacy must have a statistically significant connection with the independent variable Any time the link "between the independent and dependent variables is lower without the mediating variable," we have a

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mediation effect (Hypothesis 4; total effect). Partially mediated research is distinguished from complete mediation by the presence of both substantial "direct and indirect effects, with the direct impact being less than the total effect (i.e., the effect without mediation) but distinct from zero."

Results

Descriptive statistics

As seen in Table 2, we first evaluated the data using a descriptive approach. Means were computed and compared to theoretical means for this reason. "Numbers higher than the theoretical mean indicate agreement with the items on this scale, while lower scores suggest disapproval." Compared to the theoretical mean, "teachers rated their principals'" leadership behaviours "in the areas of instructional development (M 2.29, SD 0.68) and staff development (M 2.21, SD 0.73) as considerably below the norm." In addition, instructors rated their ability to collaborate with colleagues "(M 2.31, SD 0.56, p = 0.001)" as excellent (M 2.31, SD 0.56). The collective efficacy of instructors was found to be substantially higher than the theoretical mean "(M 2.95, SD 0.68, p 0.001), indicating that teachers have a high opinion of their own efficacy" as a whole.

Analysis of correlations

As a preliminary step, we calculated the bivariate correlations between all manifest characteristics and the factors that we were interested in investigating (see Table 3). (r 0.67, p = 0.01) We identified a substantial link between instructional and staff development. There was also a moderate correlation between the two measures and the collective efficacy (instructional development: r 14 0.46; staff development: r 14 0.49), which is consistent with previous research.

Analysis of mediation

"Principal leadership, collective effectiveness, and teacher collaboration were evaluated using a structural equation model." In separate models for Hypotheses 1 and 2, "we evaluated direct correlations between latent variables. Hypothesis 1: Principal leadership and teacher collaboration have a statistically large direct impact (b 0.56, p 0.001)." When administrators were engaged in educators' education and training, they cooperated more. Principal leadership and collective efficacy (H2) and collective efficacy and teacher collaboration (H3) have a strong relationship. Figure 2 reveals that the whole mediation model (w2 (p 0.001, df115) 415.47, GAMMA 0.98, CFI 0.94, and SRMR 0.05) had a reasonable model fit. The model's Hypothesis 4 is mediated by teachers' collective efficacy. According to H1, the direct impact of principal leadership on teacher cooperation (b 0.42, p 0.001) is smaller than the linking coefficient (b 0.42, p 0.001). The collective effectiveness of teachers mediates b 0.13's (p 0.05) indirect influence. This explains 32% of the variation in teacher collaboration.

Discussion

Principal leadership strategies and teachers' collective effectiveness and collaboration were investigated. Instructors rated their principals' instructional and staff development activities below average. According to our research, school administrators aren't actively improving education or developing teachers' skills. This matches German research. In Germany, school administrators are valued higher than educational leaders. "Because they are members of the school's faculty, German principals spend less time on school improvement (e.g., staff development)" (Kementhofer, et al. 2022). Despite not devoting much effort to school reform, they look involved since they desire professional growth.

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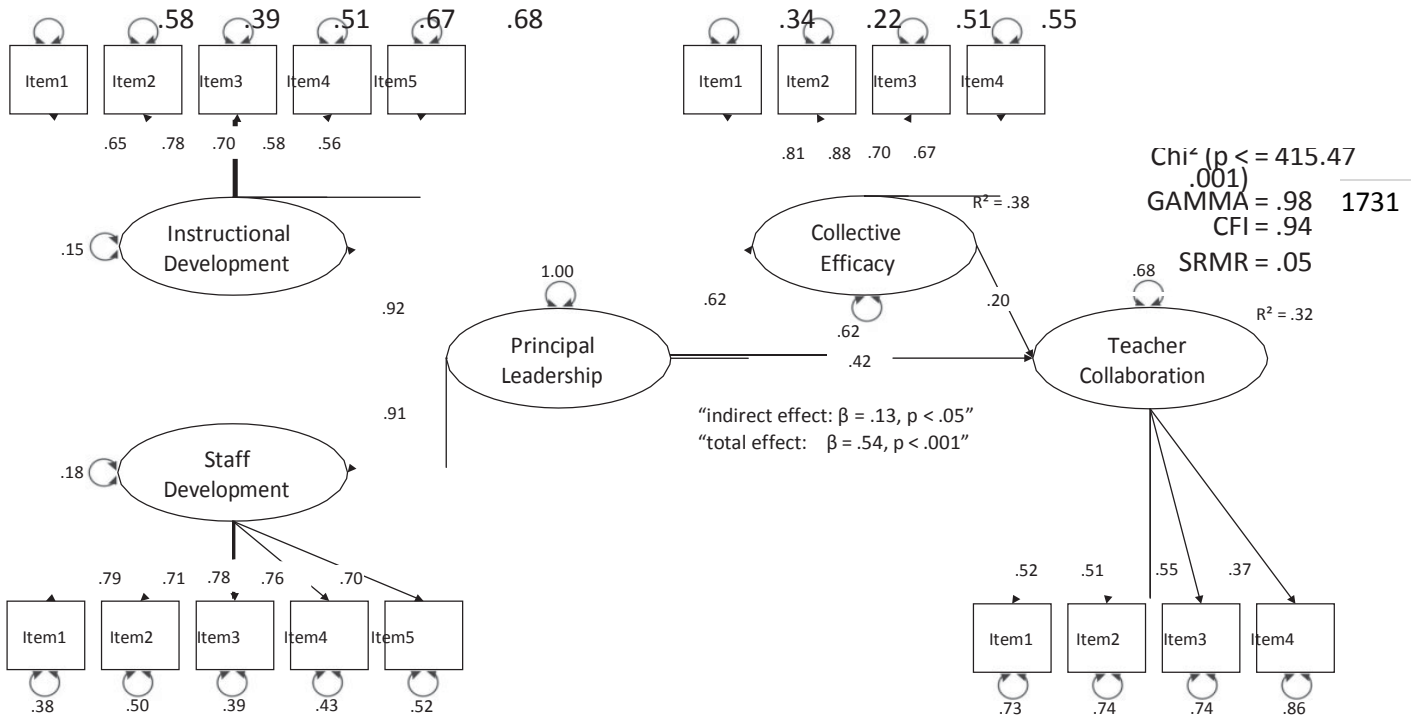

Figure 2. "The model of mediation analysis. The role of collective efficacy as a go-between for the leadership of principals and teacher cooperation."

We also discovered that instructors seldom cooperate together, which is consistent with findings from Germany, where teachers share knowledge and instructional materials, "but collaborate on a more complicated level very little (e.g., teaching as a team)." Teachers in Germany may be to blame since they don't have enough time to collaborate with each other during the school day. As a result, students are more inclined to cooperate willingly when cooperation is encouraged in the classroom and teachers are given set time periods to work together.

Teachers' collective efficacy mediates "leadership practices and teacher collaboration, according to our research." This result supports Hypothesis 1, which claims that principals engaging "in instructional and staff development are more likely to operate" in collaborative environments. Research links principal leadership with teacher collaboration. Principals may provide supportive structures for instructors to collaborate regularly. Teacher collaboration is affected by both structural and social factors. "Teachers' collective efficacy moderated the connection between leadership and teacher collaboration."

According to our mediation study, teachers report higher collective effectiveness and work together more when "principals are engaging in instructional and staff development (Hypotheses 2 and 4)." Previous research supports the results. Studies have shown low to medium relationships between principle leadership and collective effectiveness, but the present research found a strong link. Trust and collective effectiveness are key to professional learning group collaboration, research shows (Thessin, 2021).

Our results will help school leadership and transformation. The research found a substantial link between principle leadership and teachers' collective effectiveness. This study examined principal leadership not via instructional or transformational theories, but through instructional and staff development leadership methods. "The study examines the link between principal leadership, collective

effectiveness, and teacher cooperation in Germany." We found that teachers' collective effectiveness is strongly connected with outstanding principal leadership.

Conclusion

The results have ramifications for educational institutions, including schools and the administrators who run them. Teachers' collective efficacy appears to be linked to principals' involvement in school reform, "particularly in the areas of instructional and staff development." Teaching staffs' mastery experiences may be aided by administrators giving them with chances to enhance their quality of instruction while also strengthening their own skill set and knowledge base. Principals in this situation have the option of establishing school-wide educational objectives or ensuring that instructors routinely "undertake mutual classroom visits and receive feedback on their own performance." both are viable alternatives. In addition, they are able to talk about their students' learning requirements and emphasize areas for growth in their staff evaluations and apply these measures in their schools on a consistent basis (Meyer, et al. 2022). Inexperienced teachers are especially in need of the support of their peers and principals, as they frequently encounter difficult situations and are at danger of failing. As long as "principals have the time to carry out all these duties, then all of these things are relevant."

As both administrators and instructors, German school principals have little spare time for professional development for their staff. In addition, principals must have specialized training in these areas if they are to become more involved in the education of their staff and students. Considering how many principals have expressed a "need for assistance in this area, more should be done to provide principal training and professional development programs that incorporate these issues." Alternately, schools' heads might use shared leadership models to distribute these duties to other members of their staff, who may have the necessary qualifications.

A few—primarily methodological—"limitations must be considered when interpreting the results of this study." Because we utilized a cross-sectional approach, we were unable to draw inferences regarding causal correlations between variables. Analysis of bivariate data using regression yields only bivariate correlations as a result of the findings. Teachers' collective efficacy and collaboration cannot be fully understood using cross-sectional quantitative data alone. Qualitative study on individual instances and longitudinal research methodologies are thus required. In addition, we discovered a substantial link between educational initiatives and employee growth. Despite the fact that this is a logical explanation, we were unable to pinpoint the effects of these two factors throughout our investigation. "Teachers' individual effectiveness isn't the only factor at play when it comes to the link between principle leadership and teacher cooperation." Teachers' ability to innovate, a school's social atmosphere, trust among colleagues, and peer support can all act as mediating factors. As a result, future empirical investigations should take into consideration other variables while investigating this association.

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