



Guidelines for Developing Teacher Leadership in the 21st Century for Ordinary High Schools in Chongzuo City, People's Republic of China

Huang Meiqiu^{1*}, Siranee Chutopama² and Narumon Sakpakornkan³

¹ Ph.D. program in Educational Administration, Buriram Rajabhat University, Buriram, Thailand

² Faculty of Education, Buriram Rajabhat University, Buriram, Thailand

³ Faculty of Education, Buriram Rajabhat University, Buriram, Thailand

^{1*} E-mail: meiqiu.hua@bru.ac.th, ORCID ID: <https://orcid.org/0009-0000-8310-6174>

² E-mail: siranee.ch@bru.ac.th, ORCID ID: <https://orcid.org/0009-0002-7626-0741>

³ E-mail: narumon.sp@bru.ac.th, ORCID ID: <https://orcid.org/0009-0009-6115-2028>

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Abstract

Background and Aim: The development of teacher leadership in ordinary high schools in Chongzuo City, People's Republic of China, is crucial for fostering innovation, critical thinking, and student-centered learning to enhance school effectiveness and meet the evolving demands of 21st-century education. This research aims to 1) investigate the current status of 21st-century teacher leadership; 2) study the development of the guidelines for teacher leadership in these schools; and 3) evaluate the guidelines for their further development.

Materials and Methods: The research was conducted in three phases. In Phase I, a 5-point Likert scale questionnaire (reliability = 0.923) was administered to 351 teachers from 22 ordinary high schools, with data analyzed using frequency, percentage, mean, and standard deviation. In Phase II, semi-structured interviews were conducted in two steps: first with 10 award-winning teachers and then with 10 experts, selected through purposive sampling, to inform the development of the guidelines. In Phase III, the guidelines and accompanying manual were evaluated using 5-point Likert scale questionnaires administered to 15 administrators and 20 department heads; data were analyzed using mean and standard deviation.

Results: Overall, teacher leadership is at a high level. The highest scoring aspect is "promoting the use of data for educational improvement and development", followed by "accessing and utilizing research in teaching and learning" and "collaborating with parents and the community", while "facilitating learning management" scores the lowest. The developed guidelines encompass seven key areas: promoting a collaborative culture; accessing and utilizing research in teaching and learning; fostering professional teacher learning; facilitating learning management; promoting the use of data for educational improvement and development; collaborating with parents and the community; and supporting academic and professional learning. The evaluation results indicate that the guidelines and handbook exhibit high accuracy, appropriateness, feasibility, and utility.

Conclusion: The guidelines and handbook provide a practical framework for developing teacher leadership in the 21st century, fostering a scientific, individualized, collaborative, and practice-oriented education system in Chongzuo City's ordinary high schools. This approach supports teacher professional growth and enhances educational quality, modernizing the system and increasing its societal impact. However, challenges remain due to resource constraints, resistance to change, and the need for comprehensive training. Moreover, the reliance on regional quantitative data may limit the generalizability of the findings. Further mixed-methods research and broader regional comparisons are necessary to refine the framework and address these implementation barriers.

Keywords: Guidelines; Teacher Leadership; Ordinary High Schools; Chongzuo City

Introduction

Since the 21st century, China's secondary education system has been continuously evolving. In 2021, the Ministry of Education of the People's Republic of China issued the "Standards for Professional Competence of Normal Students in Secondary Education (Trial)", which provided more specific regulations on the qualities of primary and secondary school teachers in areas such as curriculum education, learning guidance, and communication and collaboration. The document explicitly emphasized the need to cultivate teachers' character and abilities, promote lifelong personal development, and enhance teachers' competencies in various aspects as the foundation for improving the quality of compulsory education in China. (Ministry of Education of the People's Republic of China, 2021)

In 2022, the Ministry of Education of the People's Republic of China issued the "Plan for Strengthening Basic Education Teachers in the New Era". This plan highlighted the importance of



following the laws of teacher growth and development, leading with the cultivation of high-quality teacher talent, supporting the construction of high-level teacher education systems, and focusing on enhancing teachers' ideological and political qualities, professional ethics, and teaching capabilities. The goal is to promote the coordinated development of teacher quantity, quality, and structure. (Ministry of Education of the People's Republic of China, 2022)

According to the "National Medium- and Long-Term Education Reform and Development Plan (2010-2020)", the Education Supervision Committee of the Guangxi Zhuang Autonomous Region has formed an evaluation team to assess and endorse international curriculum concepts. It was found that at the ordinary high school level in Chongzuo City, there are 22 ordinary high schools, and among them, 9 schools have teacher-to-student ratios that do not meet the standards. Specifically, Tazin National High School has a teacher-to-student ratio of 1:20.68 with 104 vacant teaching positions, Tianting National High School has a ratio of 1:18.5 with 58 vacant teaching positions, and the provincial high school has a teacher-to-student ratio of 1:16.83 with 84 vacant teaching positions. (Department of Education of Guangxi Zhuang Autonomous Region, 2024) This significant shortage of qualified teachers and the resulting imbalance in teacher-to-student ratios indicate a systemic issue that likely undermines the development of teacher leadership. Overburdened teachers with limited professional support are less able to assume leadership roles, which in turn affects instructional quality and school innovation. Our survey results further suggest that teacher leadership in Chongzuo City's ordinary high schools is relatively low, despite the overall high expectations for educational quality. Therefore, it is imperative to develop targeted guidelines to enhance teacher leadership, ensuring that educational reforms can effectively address these deficiencies and meet the evolving demands of 21st-century education.

Despite these policy advancements, practical challenges remain in teacher leadership development, particularly in less developed regions such as Chongzuo City. A significant shortage of qualified teachers and an imbalance in teacher-to-student ratios hinder leadership growth, as overburdened teachers with limited support struggle to take on leadership roles. Additionally, the absence of structured leadership training and collaborative professional learning environments further restricts their ability to drive educational innovation. Our survey results indicate that while expectations for educational quality are high, teacher leadership in Chongzuo's ordinary high schools remains relatively weak. Therefore, this study aims to develop targeted guidelines to strengthen teacher leadership, aligning with national education policies and addressing systemic barriers to ensure effective educational reform.

Objectives

1. To analyze the status of 21st-century teacher leadership in ordinary high schools in Chongzuo City, People's Republic of China.
2. To develop guidelines for the development of 21st-century teacher leadership in ordinary high schools in Chongzuo City, People's Republic of China.
3. To evaluate the guidelines for the development of 21st-century teacher leadership in ordinary high schools in Chongzuo City, People's Republic of China.

Literature Review

Goleman (1995) argues that teacher leadership is built on a foundation of professional competence and self-leadership. In this framework, emotional intelligence is central—it comprises self-awareness, self-regulation, motivation, empathy, and social skills. Goleman posits that teachers who excel in these areas can better manage their own emotions, navigate stress, and build positive relationships with colleagues and students. Recent research has underscored that emotional intelligence—including self-awareness, self-regulation, motivation, empathy, and social skills—is critical not only for teachers' well-being but also for fostering a learning-conducive and collaborative environment (Liu, 2023). Moreover, continuous learning and reflective practice are vital; as demonstrated by Yang and Li (2025), teachers who regularly update their knowledge and critically assess their teaching methods are better equipped to adapt to emerging



educational challenges and drive instructional innovation. These findings highlight the interconnected nature of emotional intelligence and professional development, suggesting that a teacher's ability to manage emotions and engage in reflective practice can directly influence their effectiveness in the classroom. In particular, the integration of these competencies fosters a culture of continuous improvement, where teachers are motivated to seek out new strategies and collaborate with colleagues.

Katzenbach and Smith (1993) argue that effective teams are built on the foundation of clear, well-defined goals that align all members towards a shared vision. This clarity enables team members to coordinate their efforts efficiently and measure progress consistently. They also emphasize the importance of deep collaboration, where open communication, mutual trust, and active sharing of ideas are pivotal. Recent research by Lei (2024) expands on this idea, demonstrating that structured teacher collaboration not only strengthens leadership skills but also fosters innovative practices and continuous professional development. She further emphasizes that such collaborative frameworks are essential for adapting to evolving educational challenges, leading to significant improvements in overall school performance and creating a dynamic environment for sustained educational reform.

DuFour and Eaker (1998) argue that the Professional Learning Communities (PLC) model is fundamental to continuous teacher development. They posit that when educators work collaboratively, they can collectively establish shared goals, reflect on and refine their instructional practices, and engage in regular dialogue about best practices. This collaborative environment enables teachers to analyze student performance data, identify challenges, and devise effective strategies to enhance learning outcomes. Moreover, the PLC framework fosters a culture of trust and mutual support, where knowledge and expertise are freely shared among colleagues, leading to both individual and systemic improvements. Recent studies further reinforce these findings; for instance, Li and Yu (2022) demonstrate that effective PLC significantly boosts teacher efficacy and student achievement by promoting regular reflective practice and collaboration. Similarly, Yang (2024) found that schools with robust PLCs report higher levels of instructional innovation and sustained professional growth, underscoring the pivotal role of collaborative frameworks in driving educational success.

Fullan (1991) argues that effective collaboration between schools, families, and the community is crucial for fostering a comprehensive environment that supports all aspects of student development. In his theory of educational change, he emphasizes that when educational institutions actively engage with community stakeholders—such as parents, local businesses, and civic organizations—a synergistic effect is created that enhances learning outcomes and social development. This partnership enables the sharing of resources and ideas, leading to more innovative and responsive educational practices. Recent studies reinforce these findings; for example, Mao and Wang (2022) highlight that structured parental involvement improves student motivation and academic success. They found that schools fostering strong family engagement report lower dropout rates and higher student achievement. Additionally, Ma and Zhang (2023) emphasize that collaboration between schools and local businesses provides students with practical learning opportunities, bridging the gap between theoretical knowledge and real-world applications. Moreover, strong home-school collaboration builds trust and accountability, motivating all parties to work toward common educational goals and ensuring sustainable educational improvements.

Teacher leadership is fundamentally built on professional competence, self-leadership, and emotional intelligence, which enable educators to manage emotions, navigate stress, and foster collaborative learning environments. Continuous learning and reflective practice further enhance their adaptability to educational challenges, promoting instructional innovation and sustained professional growth. Effective teacher collaboration plays a crucial role in leadership development, as structured teamwork, clear goals, and open communication improve problem-solving, instructional quality, and overall school performance. Professional Learning Communities (PLCs) provide a strong foundation for ongoing teacher development by fostering a culture of shared goals, reflective practice, and knowledge exchange, which has been shown to enhance teacher efficacy and student achievement. Additionally, collaboration between schools, families, and the community strengthens educational outcomes by

facilitating resource sharing, bridging theoretical learning with practical applications, and improving student motivation. A well-integrated approach that combines emotional intelligence, teamwork, professional learning, and community collaboration is essential for advancing teacher leadership and driving educational success.

Through a review of previous studies, we found that while research on the framework of teacher leadership has made certain progress, most studies remain confined to exploring the framework itself. However, the "Teacher Leader Model Standards" proposed by the Teacher Leadership Exploratory Consortium (2010) take a fresh perspective, breaking through the limitations of earlier research. These standards state that "The Teacher Leader Model Standards identify seven domains central to teacher leadership: promoting a collaborative culture; accessing and utilizing research in teaching and learning; fostering professional teacher learning; facilitating learning management; promoting the use of data for educational improvement and development; collaborating with parents and the community; and supporting academic and professional learning."

This new perspective offers valuable ideas and methods for further in-depth research on teacher leadership in the 21st century in Chongzuo City. Therefore, this study will focus on exploring this theoretical viewpoint.

Conceptual Framework

The conceptual framework of this study is shown in Figure 1.

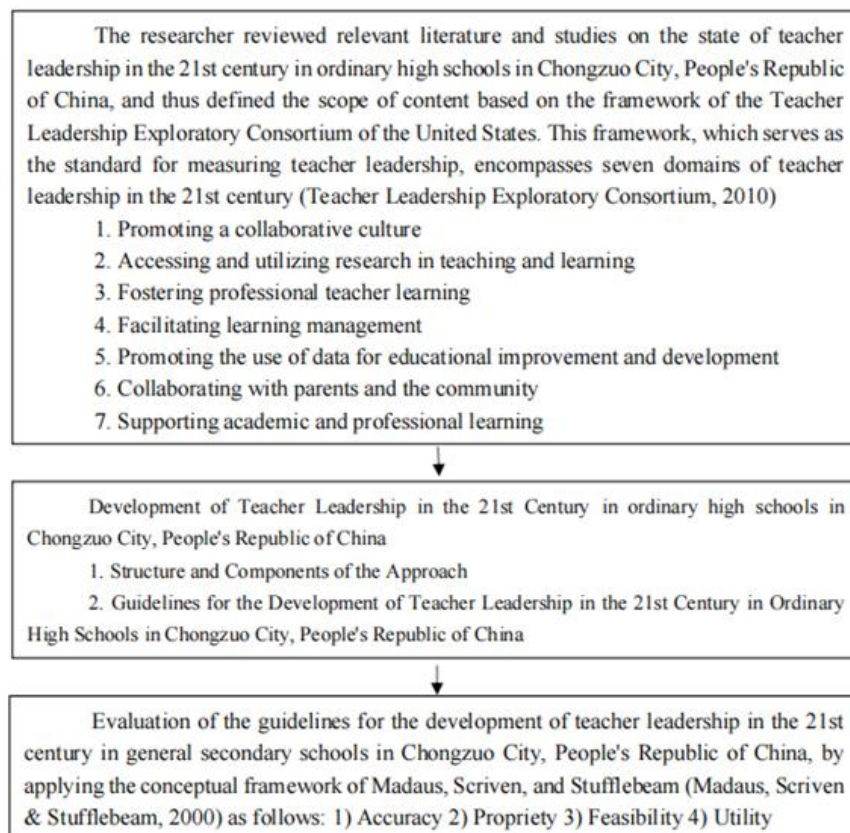


Figure 1 Research conceptual framework

Note: Constructed by the researcher

Methodology

1. Population and Samples

Phase 1: In this phase, the research encompassed 3,739 teachers from 22 ordinary high schools in Chongzuo City, People's Republic of China. The sampling was carried out using the Krejcie & Morgan table (Krejcie & Morgan, 1970), employing multi-stage sampling, followed by simple random sampling, to select 351 teachers as the sample. Phase 2: To develop the teacher leadership guidelines, the researchers employed purposive sampling to select 10 award-winning (Best Practice) teachers and 10 experts from Chongzuo City, People's Republic of China, for interviews. Phase 3: In this phase, researchers used purposive sampling to select two target groups for evaluation: 15 administrators and deputy academic officers from ordinary high schools assessed the accuracy and appropriateness of the guidelines and manual, while 20 department heads from ordinary high schools evaluated the feasibility and utility in fostering teacher leadership within the context of 21st-century ordinary high schools.

2. Research Tools

Phase 1: The research tools for this phase included: 1) a questionnaire on the status of teacher leadership in 21st-century ordinary high schools in Chongzuo City, People's Republic of China; and 2) an Item-Objective Congruence (IOC) rating form for evaluating the questionnaire on the status of teacher leadership in 21st-century ordinary high schools in Chongzuo City, People's Republic of China. Phase 2: The research tool for this phase was a semi-structured interview questionnaire on the development of guidelines for teacher leadership in 21st-century ordinary high schools in Chongzuo City, People's Republic of China. Phase 3: The research tools for this phase included: 1) a questionnaire on the accuracy and appropriateness of the guidelines for developing teacher leadership in 21st-century ordinary high schools in Chongzuo City, People's Republic of China; and 2) a questionnaire on the feasibility and usefulness of the guidelines for developing teacher leadership in 21st-century ordinary high schools in Chongzuo City, People's Republic of China, using a 5-point rating scale.

3. Data Collection

Phase 1: The first step involved distributing an Item-Objective Congruence (IOC) rating form online to five experts regarding the status of teacher leadership at ordinary high schools in Chongzuo City, People's Republic of China, inviting experts to rate each item. The second step was the dissemination of a pre-designed questionnaire on the development of teacher leadership online via Questionnaire Star. This questionnaire employed a 5-point rating scale and covered multiple dimensions to assess the status of teacher leadership development in ordinary high schools in Chongzuo City. After collecting the data, statistical software was used for data organization and preliminary analysis, including the calculation of frequencies, percentages, means, and standard deviations. Phase 2: In this phase, purposive sampling was used to select teachers who have received the Best Practice award and experts from ordinary high schools in Chongzuo City for semi-structured interviews. The interviews were conducted online and lasted for more than one hour. A pre-designed semi-structured questionnaire containing both open and closed questions guided the interviews, aiming to explore the development measures of the guidelines for teacher leadership in the 21st century, challenges encountered, and solutions adopted. All responses were systematically transcribed and coded for analysis. Phase 3: In this phase, purposive sampling was used to select principals or vice-principals and department heads from ordinary high schools in Chongzuo City to evaluate the guidelines for developing teacher leadership in 21st-century ordinary high schools. The first step involved distributing an online questionnaire on the correctness and applicability of the guidelines to 15 principals or vice-principals. The second step involved distributing an online questionnaire on the accuracy and appropriateness of the guidelines to 20 department heads. To protect participant confidentiality, all collected data were anonymized, and personal identifiers were removed before analysis. Participants were informed about the research purpose, and consent was obtained before participation. Additionally, data storage and handling complied with ethical guidelines to ensure privacy and security.

4. Data Analysis

Phase 1: The first step involved aggregating the IOC (Index of Item-Objective Congruence) scores from five experts, calculating the average IOC score for each item, and retaining items with an average score of 0.5 or higher. The second step was descriptive statistical analysis. Descriptive statistics were used to summarize the data from the questionnaire on the status of teacher leadership in Chongzuo City, including frequencies, percentages, means, and standard deviations, to provide a preliminary understanding of the sample characteristics. Phase 2: The transcribed texts from semi-structured interviews were processed through content analysis. This analysis aimed to identify the key elements in the development of the guidelines for teacher leadership in the 21st century. Phase 3: The first step involved conducting a statistical analysis on the data from the preliminary evaluation form for the guidelines on developing teacher leadership in the 21st century in Chongzuo City, calculating means and standard deviations to assess the accuracy and appropriateness of the guidelines. The second step involved performing statistical analysis on the data from the evaluation form for the guidelines on developing teacher leadership in the 21st century in Chongzuo City, calculating means and standard deviations to evaluate the feasibility and usefulness of the guidelines.

Results

Regarding the guidelines for developing teacher leadership in the 21st century for ordinary high schools in Chongzuo City, People's Republic of China, the researchers summarized the findings as follows:

1. This study investigated the status of teacher leadership in the 21st century for ordinary high schools in Chongzuo City, People's Republic of China. Through data analysis, it was found that, overall, all aspects were at a relatively high level, as shown in the following table:

Table 1 Mean and Standard Deviation of the Status of Teacher Leadership for Ordinary High Schools in Chongzuo City, People's Republic of China.

NO.	The development of teacher leadership.	\bar{X}	S.D.	Level	Rank
1	Promoting a collaborative culture	3.62	0.83	high	4
2	Accessing and utilizing research in teaching and learning	3.64	0.84	high	2
3	Fostering professional teacher learning	3.60	0.79	high	5
4	Facilitating learning management	3.56	0.75	high	7
5	Promoting the use of data for educational improvement and development	3.68	0.77	high	1
6	Collaborating with parents and the community	3.64	0.82	high	2
7	Supporting academic and professional learning	3.59	0.83	high	6
Overall Mean		3.62	0.80	high	

From Table 1, it was found that the status of teacher leadership in the 21st century for ordinary high schools in Chongzuo City was overall at a high level ($\bar{X} = 3.62$). When considering individual aspects, the aspect of promoting the use of data for educational improvement and development ($\bar{X} = 3.68$) had the highest mean, followed by the aspects of accessing and utilizing research in teaching and learning, and collaborating with parents and the community ($\bar{X} = 3.64$). The aspect with the lowest mean was facilitating learning management ($\bar{X} = 3.56$).

2. The study found that the guidelines for developing teacher leadership in the 21st century for ordinary high schools in Chongzuo City, People's Republic of China, include the following components:

The guidelines are organized into several key sections: Background, which provides the context and rationale for the development of teacher leadership; Significance, highlighting the importance of fostering teacher leadership in the 21st century; Objectives, outlining the specific goals of the guidelines; Expected Outcomes, detailing the anticipated results of their implementation; and Principles, which establish the foundational values guiding the development process. Additionally, the guidelines incorporate



Measurement and Evaluation of Development to assess progress and effectiveness, as well as Development Methods to outline practical strategies for implementation.

The guidelines are further divided into seven modules, each focusing on a critical aspect of teacher leadership development:

Module 1: Promoting the Use of Data for Educational Improvement and Development

Module 2: Accessing and Utilizing Research in Teaching and Learning

Module 3: Collaborating with Parents and the Community

Module 4: Promoting a Collaborative Culture

Module 5: Fostering Professional Teacher Learning

Module 6: Supporting Academic and Professional Learning

Module 7: Facilitating Learning Management

These modules collectively provide a comprehensive framework for enhancing teacher leadership in ordinary high schools, aligning with the cultural and educational context of Chongzuo City.

3. Evaluation of the Guidelines for Developing Teacher Leadership in the 21st Century in Ordinary High Schools in Chongzuo City, People's Republic of China

3.1 Fifteen principals and vice-principals from ordinary high schools evaluated the guidelines for developing teacher leadership in the 21st century for ordinary high schools in Chongzuo City. The results indicated that the guidelines demonstrated a high level of accuracy and applicability, as shown in the following table:

Table 2 Results of the Validation of Accuracy and Appropriateness of the Guidelines for Developing Teacher Leadership in the 21st Century for Ordinary High Schools in Chongzuo City, People's Republic of China, Overall and by Aspect.

NO.	The development of teacher leadership	\bar{X}	S.D.	Level	Rank
1	Promoting the use of data for educational improvement and development	3.82	0.84	high	1
2	Accessing and utilizing research in teaching and learning	3.79	0.81	high	2
3	Collaborating with parents and the community	3.76	0.78	high	3
4	Promoting a collaborative culture	3.73	0.86	high	4
5	Fostering professional teacher learning	3.70	0.80	high	5
6	Supporting academic and professional learning	3.63	0.88	high	6
7	Facilitating learning management	3.56	0.80	high	7
Overall mean		3.71	0.82	high	

From Table 2, the results of the validation of the accuracy and appropriateness of the guidelines for developing teacher leadership in the 21st century were overall at a high level, with a mean score of ($\bar{X} = 3.71$). When considering individual aspects, the aspect with the highest mean score was promoting the use of data for educational improvement and development ($\bar{X} = 3.82$), followed by accessing and utilizing research in teaching and learning ($\bar{X} = 3.79$). The aspect with the lowest mean score was facilitating learning management ($\bar{X} = 3.56$).

3.2 Twenty department heads from ordinary high schools evaluated the guidelines for developing teacher leadership in the 21st century for ordinary high schools in Chongzuo City. The results indicated that the guidelines demonstrated a high level of feasibility and usefulness, as shown in the following table:

Table 3 Results of the Validation of Feasibility and Usefulness of the Guidelines for Developing Teacher Leadership in the 21st Century, Overall

NO.	The development of teacher leadership	\bar{X}	S.D.	Level	Rank
1	Preface	3.65	0.67	high	13
2	Background	3.80	0.62	high	11



NO.	The development of teacher leadership	\bar{X}	S.D.	Level	Rank
3	Significance of the Guidelines for Developing Teacher Leadership in the 21st Century	3.90	0.85	high	9
4	Objectives	3.95	0.89	high	8
5	Expected Outcomes	3.85	0.88	high	10
6	Principles	3.75	0.79	high	12
7	Measurement and Evaluation of Development	3.55	0.61	high	14
8	Module 1: Promoting the Use of Data for Educational Improvement and Development	4.55	0.76	high	1
9	Module 2: Accessing and Utilizing Research in Teaching and Learning	4.35	0.81	high	2
10	Module 3: Collaborating with Parents and the Community	4.25	0.72	high	3
11	Module 4: Promoting a Collaborative Culture	4.20	0.89	high	4
12	Module 5: Fostering Professional Teacher Learning	4.15	0.88	high	5
13	Module 6: Supporting Academic and Professional Learning	4.05	0.83	high	6
14	Module 7: Facilitating Learning Management	4.00	0.80	high	7
	Overall mean	4.00	0.79	high	

From Table 3, the results of the validation of the feasibility and usefulness of the guidelines manual for developing teacher leadership in the 21st century were overall at a high level, with a mean score of (\bar{X} = 4.00). When considering individual items, the item with the highest mean score was Item 8, Module 1: Promoting the Use of Data for Educational Improvement and Development, with a mean score of (\bar{X} = 4.55), followed by Item 9, Module 2: Accessing and Utilizing Research in Teaching and Learning. The item with the lowest mean score was Item 7, Measurement and Evaluation of Development, with a mean score of (\bar{X} = 3.55).

Discussion

From the analysis of data on the guidelines for developing teacher leadership in the 21st century for ordinary high schools in Chongzuo City, People's Republic of China, the research findings can be discussed as follows:

1. The Status of Teacher Leadership in the 21st Century for Ordinary High Schools in Chongzuo City

An analysis of the current status of teacher leadership in ordinary high schools in Chongzuo City reveals that teachers perform well in promoting the use of data for educational improvement and development, accessing and utilizing research in teaching and learning, and collaborating with parents and the community. However, challenges remain in facilitating learning management and fostering teacher-student interaction. Specifically, while teachers demonstrate strong abilities in using data to improve teaching, they struggle with formulating strategies when dealing with complex data. Although teachers show potential in applying research to practice, some lack awareness of its importance. Home-school collaboration has achieved some success, but its depth and practicality need improvement. Additionally, efforts to enhance teaching management and teacher-student interaction are hindered by insufficient systematic training and support mechanisms.

The findings align closely with existing literature. Yao (2021) underscores the significant role that data plays in driving educational improvement, emphasizing that the integration of data analytics into teaching practices can lead to more informed decisions and targeted instructional adjustments. However, Yao also points out that many teachers currently possess limited data analysis skills, which hampers the full potential of data-driven decision-making in the classroom. Jiang (2024) further emphasizes the



importance of educational research as a means to enhance teaching effectiveness. While research can provide a wealth of innovative ideas and evidence-based practices, Jiang notes that teachers often struggle to apply these research findings effectively in their daily instructional practices, partly due to insufficient training and a lack of resources for translating theory into practice. Complementing these perspectives, Cheng and Chen (2017) assert that strong teaching management skills are essential for maintaining high levels of teaching efficiency and ensuring smooth classroom operations. They argue that despite the critical nature of these skills, many teachers do not receive adequate training or support in this area, which limits their ability to manage the complexities of modern classroom environments. Collectively, these studies highlight a persistent gap between the potential benefits of data utilization, research application, and effective management practices, and the current capabilities of teachers, thereby reinforcing the need for enhanced professional development and support structures to fully realize the benefits of teacher leadership in the 21st century.

2. Guidelines for Developing Teacher Leadership in Ordinary High Schools in Chongzuo City in the 21st Century

The research findings indicate that the Guidelines for Developing Teacher Leadership in Ordinary High Schools in Chongzuo City in the 21st Century represent a systematic and modular educational reform approach. The primary goals are to enhance teacher leadership, promote educational quality, and foster educational equity in the region. These guidelines were designed based on the educational context of Chongzuo City and outline a development framework comprising seven key areas: 1) Promoting the Use of Data for Educational Improvement and Development; 2) Accessing and Applying Research in Teaching and Learning; 3) Collaborating with Parents and the Community; 4) Promoting a Collaborative Culture; 5) Fostering Professional Teacher Learning; 6) Supporting Academic and Professional Learning; and 7) Facilitating Learning Management.

Teachers have achieved a certain level of success in managing student-centered teaching, reflecting flexibility in their instructional approaches. However, their abilities in holistic teaching management and collaborative teaching between teachers and students still require further development. This may stem from insufficient training in management and incomplete teaching support systems (e.g., teaching tools and time management mechanisms). Additionally, some teachers lack confidence in creating interactive teaching models, which hinders the improvement of teaching management processes.

The findings align closely with existing literature. Fu (2018) demonstrated that the systematic use of data can significantly enhance the efficiency and accountability of school operations by informing targeted instructional strategies and decision-making processes. Similarly, Li (2000) emphasized the practical application of teaching research, arguing that when teachers effectively integrate research findings into their practice, it leads to innovative and evidence-based instructional improvements. Additionally, Wang (2021) highlighted that diverse and well-supported training programs are essential for motivating teachers' professional growth, as they provide the necessary tools and resources to adapt to evolving educational challenges. Collectively, these studies suggest that an integrated approach—combining data-driven management, practical application of research, and comprehensive professional development—is vital for fostering teacher leadership and driving educational excellence.

3. Evaluation of the Accuracy and Appropriateness of the Guidelines for Developing Teacher Leadership in the 21st Century and the Feasibility and Usefulness of the Manual for Developing Teacher Leadership in the 21st Century

The research findings indicate that the evaluation of the accuracy and appropriateness of the guidelines for developing teacher leadership in ordinary high schools in Chongzuo City was overall at a high level. When considering individual aspects, the aspect with the highest mean score was Promoting the Use of Data for Educational Improvement and Development, followed by Accessing and Utilizing Research in Teaching and Learning. The aspect with the lowest mean score was Facilitating Learning Management.

Regarding the evaluation of the feasibility and usefulness of the manual for developing teacher leadership in the 21st century, the research findings show that the highest mean score was for Module 1:



Promoting the Use of Data for Educational Improvement and Development, followed by Module 2: Accessing and Utilizing Research in Teaching and Learning. The lowest mean score was for Item 7: Measurement and Evaluation of Development.

Based on the evaluation results, the following discussion can be made: This perspective aligns with the research of Li and Hu (2022), who underscore that the advancement of educational informatization has equipped teachers with sophisticated data tools and robust analytical methods. This technological progress enhances teachers' ability to process and interpret complex datasets, supports evidence-based decision-making, and contributes to improved teaching efficiency and student outcomes. Furthermore, integrating technology into daily teaching practices fosters a shift from traditional methods to more dynamic, responsive, and data-informed instructional strategies. Similarly, Xu (2022) highlights the pivotal role of modern learning management systems and adaptive teaching strategies in creating personalized learning experiences, optimizing resource allocation, and improving overall instructional effectiveness. However, while these advancements offer significant benefits, there are also challenges. Many teachers lack sufficient training in data literacy and struggle to effectively apply technology-driven approaches in their teaching. Additionally, disparities in technological infrastructure across schools may hinder the widespread adoption of these strategies, limiting their impact. Moreover, reliance on data-driven decision-making raises concerns about the risk of depersonalizing education, as excessive focus on analytics may overlook important qualitative aspects of student learning. Therefore, while the integration of technology and data-driven methods presents substantial opportunities for enhancing teacher leadership and instructional quality, addressing training gaps, resource allocation, and ethical considerations is essential for maximizing its effectiveness.

Conclusion

The guidelines for developing teacher leadership in the 21st century, along with the accompanying handbook, provide a practical framework for real-world application within the education system. They address critical areas, including: 1) Promoting the use of data processing for educational improvement and development; 2) Accessing and utilizing research in teaching and learning; 3) Collaborating with parents and communities; 4) Promoting a culture of collaboration; 5) Promoting professional teacher learning; 6) Supporting academic and professional learning; and 7) Facilitating learning management. This study contributes to the existing literature by bridging the gap between theoretical models of teacher leadership and their practical implementation in secondary education. Unlike previous research, which primarily focused on defining teacher leadership, this study offers a structured set of guidelines tailored to the specific context of Chongzuo City's ordinary high schools, addressing both systemic challenges and localized needs.

Beyond addressing immediate educational needs, these guidelines have broader implications for enhancing teacher leadership development in similar educational settings. By fostering a scientific, individualized, collaborative, and practice-oriented education system, this approach enhances the capacity of education to impact society and the economy, ensuring alignment with ongoing educational reform and regional modernization efforts.

Future research could explore the long-term effectiveness of these guidelines through longitudinal studies, assessing their impact on teacher leadership development, student learning outcomes, and overall school performance. Additionally, comparative studies across different educational regions could provide insights into the adaptability and scalability of the proposed framework.

Recommendations

Based on the study of the Guidelines for the Development of 21st-Century Teacher Leadership in Ordinary High Schools in Chongzuo, People's Republic of China, methods for enhancing teacher leadership development in high schools have been proposed, covering seven key areas: 1) Promoting a collaborative culture; 2) Accessing and utilizing research in teaching and learning; 3) Fostering professional teacher learning; 4) Facilitating learning management; 5) Promoting the use of data for educational improvement



and development; 6) Collaborating with parents and the community; and 7) Supporting academic and professional learning. The study found that the overall status of teacher leadership development is at a relatively high level, with "Promoting the use of data for educational improvement and development" receiving the highest average score, while "Facilitating learning management" had the lowest. Based on these findings, the researchers propose the following recommendations:

1. Implementation Recommendations

1.1 Enhancing Data-Driven Educational Decision-Making

In the analysis of 21st-century teacher leadership in ordinary high schools in Chongzuo, the highest average score was observed in "Promoting the Use of Data for Educational Improvement and Development," indicating that this is a key factor influencing teacher leadership. To enhance high school teachers' data analysis and processing capabilities, schools and other educational institutions should establish a "data-driven instructional decision-making mechanism". This includes utilizing "intelligent data analysis platforms" to monitor student learning progress and teacher performance in real time and adjusting teaching strategies based on analytical reports. Additionally, "teachers' data literacy" should be strengthened through "regular training programs", equipping them with data analysis skills to optimize classroom instruction.

1.2 Comprehensive Development of Teacher Leadership

The study found that 21st-century teacher leadership in Chongzuo's high schools requires development in seven key areas: 1) Promoting the use of data for educational improvement and development; 2) Accessing and utilizing research in teaching and learning; 3) Collaborating with parents and the community; 4) Promoting a collaborative culture; 5) Fostering professional teacher learning; 6) Supporting academic and professional learning; and 7) Facilitating learning management. To comprehensively improve these areas, guidelines should be developed and implemented, offering systematic strategies and practical recommendations for teacher leadership development.

1.3 Application and Continuous Improvement of the Guidelines

The evaluation of the guidelines shows consistently high average scores, indicating their effectiveness in enhancing 21st-century teacher leadership in high schools. Therefore, ordinary high schools should actively apply these guidelines in teacher leadership development efforts. Furthermore, schools should provide supportive resources, including learning management systems (LMS), institutional support, and research guidance for teachers. To ensure sustained progress, ongoing research and refinement of the guidelines should be conducted, ensuring their continuous improvement and relevance to the evolving educational landscape.

2. Next Steps for Research:

2.1 Conduct in-depth research on how to more effectively apply data analysis in the education system to optimize decision-making and teaching improvement. By developing intelligent data analysis platforms, real-time monitoring of student learning status and teacher teaching effectiveness can be achieved, combined with machine learning algorithms to provide precise decision-making support for educational administrators.

2.2 Explore specific implementation pathways for home-school collaboration and teacher cooperation to form replicable success cases. By establishing online home-school communication platforms, real-time interaction among parents, teachers, and students can be promoted, clarifying students' learning needs and support plans.

2.3 Strengthen practical education research to provide more support pathways for the integration of academics and careers, enhancing the social adaptability and economic value of education. By collaborating with enterprises and communities to establish practical education bases, academic research and vocational skill development can be organically integrated.



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