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QUALITIES OF PUBLIC-SCHOOL ADMINISTRATORS IN LEADING 21ST CENTURY TEACHERS: A MIXED METHOD EXPLORATORY APPROACH

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Abstract:
Public school administrators have problems leading 21st-century teachers regarding work ethic perception and attitude, leniency of work, personal character problems, and work adjustment. This study aimed to develop and validate a measurement model of qualities of public-school administrators in leading 21st-century teachers, focusing on Teaching Practices and Sound Leadership, Personal Growth and Professional Upliftment, and Better Relationships. Using a mixed-methods research design, the study involved school heads from both the elementary and secondary levels of the Davao Region. Data were gathered through surveys and interviews and analyzed through thematic analysis, Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA). Furthermore, data were collected from 13 School Heads and Master Teachers in public schools for an in-depth interview to gauge their perspective on the qualities of a public-school administrator. Drawing from this data, a comprehensive set of statement items was formulated to capture the identified perspective accurately. These items underwent meticulous validation by a panel of expert to ensure their reliability and relevance to the study's objectives. Subsequently, the validated items were administered to a larger sample comprising 300 School Heads. Employing Exploratory Factor Analysis and Confirmatory Factor Analysis, the study uncovered two primary qualities in leading 21st Century Teachers: Collaboration and Support Among Staff/Teacher and Mentoring and Instructional Coaching. This systematic approach sheds light on the diverse perspectives of public-school administrators regarding the qualities of leading 21st-century teachers.

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It provides valuable insights for school heads to tailor their qualities in leading our modern teachers to work efficiently and effectively to meet the needs of their administration and work environment.

SDG #4: Quality Education

Keywords: school head, public-school administrators, teacher, qualities, mixed method, Philippines

1. Introduction

Public school administrators are commonly recognized as the head of all decisions, wisdom, and articulation of the school's vision, mission, and goals. However, the lack of essential leadership qualities among public-school administrators may hinder their effectiveness in leading, supporting, and empowering teachers to meet the challenges and demands of 21st-century education (Tshabalala, 2021). The views and attitudes of the followers assess a leader's ability to apply moral or practical values. The adherents are markers of a leader's efficacy (Page, 2008; Yukl, 2021).

The qualities of a public school's management are very important to how well the school does. Leaders who consciously analyze critically and develop their self-awareness want to lead for equity effectively, and the consciousness of equity in the early years of leaders' self-perception was affected by their experience (Halberg & Santiago, 2021). The study addresses two of the five-point agenda of the Department of Education, which are the teachers' welfare and the students' well-being. Researchers have looked at a variety of methods, including time-use patterns, interactions with teachers, building trust, creating learning environments, and managing well-organized networks of learning support teams (Grissom *et al.*, 2021). There are a few possible study gaps in the body of research on the qualities that school administrators should have in order to lead teachers in the 21st century. There is a gap between the leadership qualities demonstrated by public-school administrators and the qualities required to effectively lead, support, and develop teachers in meeting the demands of 21st-century education (van Dam & Meulders, 2021).

At the local level, this study provides insights into the leadership skills of public-school administrators, helping improve how they guide teachers in meeting 21st-century education demands. Nationally, it contributes to understanding the leadership qualities needed for effective school management and may guide DepEd and policymakers in developing leadership standards and training programs. Globally, it adds to the discussion on educational leadership amid technological change and globalization, offering knowledge that can enhance leadership and teacher support practices worldwide. Based on the literature reviews, research shows that many school administrators are not yet prepared to shift from traditional leadership to a technology-focused approach (Varela & Fedynich, 2020). Iskak and Pa-alisbo (2019) note that 21st-

century principals now also guide and prepare students for a rapidly changing world. Candrasari *et al.* (2023) highlight the importance of visionary leadership, while Kilag *et al.* (2024) stress that effective leadership is essential for driving and sustaining innovation in schools. Transformational leadership greatly influences innovation in Philippine schools. Karimi *et al.* (2023) state that such leaders empower staff, encourage creativity, and build unity. Shen *et al.* (2020) link innovative leadership to higher stakeholder engagement, teacher satisfaction, and academic success. Lupinacci (2017) adds that educators have a moral duty to promote socially just and environmentally sustainable perspectives. Leaders play a vital role in supporting teachers' identity development. When leaders engage in discussions on diversity, teachers feel a stronger sense of belonging (Grooms *et al.*, 2021). The principal's role allows frequent collaboration with teachers, and effective communication between them fosters school growth, educational quality, and professional development (Gülbahar, 2020; Paul, 2020).

This study focuses only on identifying the leadership qualities of public-school administrators in leading 21st-century teachers. Other aspects of participants' development are beyond its scope. The beneficiaries are public secondary school heads, master teachers, and head teachers. Specifically, the study aims to: (1) explore their views on leadership qualities, (2) determine the dimensions of these qualities, and (3) develop a leadership qualities model. The main goal of this study is to develop a model of leadership qualities suited for public-school administrators leading 21st-century teachers. It will explore administrators' experiences, identify key dimensions of their leadership qualities, and create a model based on these findings.

The study hypothesized that the qualities of public-school administrators leading 21st-century teachers can be described through various management models—formal, collegial, political, subjective, ambiguous, and cultural. These qualities involve skills in management, technology, communication, critical thinking, teamwork, and self-development, as well as modern school administration and leadership development. According to Tony Bush, the qualities of a public administrator link managerial and leadership models to ensure effective school operations and support diverse teachers in the 21st century. The framework follows good practices and provides a theoretical basis to guide decision-making and improve managerial actions in education. This study is based on Tony Bush's (2006) educational management theory, which distinguishes management from administration and highlights good practices. It also draws on Titone (2017), who emphasizes that the qualities of teachers and administrators support innovation and effective leadership in 21st-century schools. According to Sonsaard and Darbavasu (2019), modern school administrators need a range of skills for effective 21st-century school management, including learning, analytical and creative thinking, problem-solving, communication, teamwork, technology use, judgment, achievement focus, human relations, and ethics. These skills are essential to assess the qualities of administrators leading 21st-century teachers.

Figure 1. Hypothetical Path Diagram that Could Measure Qualities of Public-School Administrators in Leading 21st Century Teachers

2. Method

This section outlines the study participants, detailing who was involved in the research. It also describes the materials, instruments, and the research design and procedures followed to ensure the study's effectiveness.

2.1 Study Participants

The study included 313 participants, with 13 for the qualitative phase selected through purposive sampling—three head teachers, five master teachers, and five principals or school heads. In-depth interviews were conducted using a validated interview guide. For the quantitative phase, 300 respondents were selected using stratified random sampling. The survey questionnaire was developed from the qualitative findings and validated by experts for reliability. Of the respondents, 250 took part in the exploratory factor analysis, and 50 in the confirmatory factor analysis.

The participants in the study were permanent employees who supervise and lead public schools in Region XI. Excluded from the study were regular or contractual employees who are not principals, head teachers, or master teachers. Employees in rank-and-file positions or those not designated as School In-Charge or Teacher In-Charge were also excluded, as they do not lead or supervise others. The participants had to fulfill specific criteria to identify as the principal, head, and master teacher at a certain public school within Region XI. These participants and respondents should express their voluntary willingness to participate in the study and provide legal documentation that grants informed permission and consent.

2.2 Materials/Instruments

The study used two research instruments: a validated interview guide for the qualitative part (for participants aged 40 and above) and a validated survey questionnaire for the quantitative part. The survey items were derived from the qualitative data and reviewed by ten validators—five internal and five external. The questionnaire has 60 items for exploratory factor analysis, while the confirmatory factor analysis was based on its results. In order to determine the validity and reliability of the questionnaire, appropriate procedures were followed.

The survey questionnaire utilized the 5-point Likert Scale to allow respondents to indicate their level of agreement quickly and effectively. The Likert scale consisted of five points with corresponding descriptions: Strongly Agree - The item described means the respondent strongly agrees with the given statement. Agree - The item described means that the respondent agrees to a certain extent with the given statement. Neither Agree nor Disagree - The item described means that the respondent neither agrees nor disagrees with the given statement. Disagree - The item described means that the respondent disagrees to a certain extent with the given statement. Strongly Disagree - The item described means the respondent strongly disagrees with the statement.

2.3 Design and Procedure

This study used an exploratory mixed-method approach to identify the qualities of public-school administrators in leading 21st-century teachers. According to Creswell (2018), this design combines both qualitative and quantitative methods. Interviews with head teachers, master teachers, and school heads was provided key statements for developing a survey questionnaire. The questionnaire's validity was ensured using the Content Validity Ratio (CVR) and evaluation by ten expert validators. As shown in Figure 2, the researcher started with the literature readings and interviewed the head teachers, master teachers, and the school head on their views of the qualities of public-school administrators. Significant statements. A survey question was used to create the survey questionnaire. The researcher employed the Content Validity Ratio (CVR) method to ensure the questionnaire's validity. A panel of ten experts was carefully chosen to evaluate the custom questionnaire. Only item statements surpassing the predetermined cutoff value of 0.80 were retained in the survey questionnaire, while those falling below the threshold were excluded.

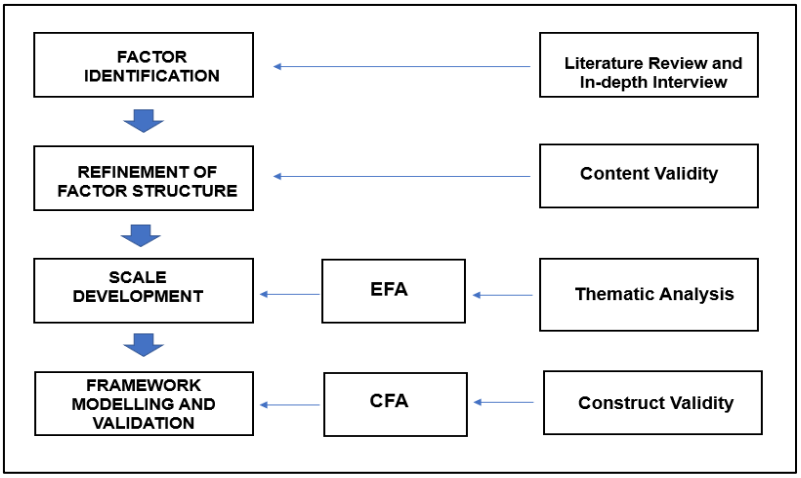


Figure 2: Research Process Flow

Exploratory Factor Analysis (EFA) groups related measurable variables into underlying factors that are not directly observed (Bartholomew, Knott, & Moustaki, 1999). It helps identify patterns among variables without a preset structure (Child, 1990) and does not require formal hypotheses (Hooper, 2012). EFA is used in this study to explore the underlying qualities of public secondary school administrators in leading 21st-century teachers. The survey questionnaire was developed from insights gathered through interviews and a literature review. Before data collection, qualified validators reviewed and revised the tool. An independent expert also evaluated it, giving a high-quality rating of four. The researcher submitted the required documents to the University Research Ethics Review Committee (UMERC) for approval and certification. A formal request to conduct the study was also sent to department heads and administrators, with endorsements from DepEd officials in the Davao Region. After receiving authorization, data collection began.

Thematic analysis examined school head views on meaningful learning in technical skills. Exploratory Factor Analysis (EFA) will identify underlying factors, patterns, and relationships, while Confirmatory Factor Analysis (CFA) will develop the best-fit model using parameters like Chi-square, TLI, and RMSEA to determine the qualities of public-school administrators.

2.4 Ethical Consideration

As this study will not involve data collection involving human, animal, or other living things, conventional ethics approval will not be sought, and an exemption will be deemed necessary. However, to conform to the guidelines on ethical conduct of research using secondary sources of data, this study shall observe full ethical standards aligned with the certificate of approval with UMERC Protocol No. UMERC-2024-368 in the conduct of the study, following the study protocol, assessments, and standardized criteria, particularly in managing the data, such as, but not limited to:

Voluntary Participation made participants join freely and may withdraw at any time without consequences. Privacy and Confidentiality of participants' information will

be protected, and sensitive data will be handled carefully. Informed Consent participants will complete a consent form and can withdraw if uncomfortable. Excluded are those not serving as principals, head teachers, master teachers, or designated School/Teacher In-Charge. Recruitment participants are selected according to the study's scope. Risks and Benefits Risks will be minimized, and participants will benefit from the study's outcomes. Academic Integrity is free from plagiarism, fabrication, and falsification will be avoided; Turnitin will ensure originality, and proper citations will be used. Permission Organizations will approve the use of consent forms for data collection. Technology is not applicable. Authorship has all sources, citations, and methods that will be properly acknowledged throughout the study.

3. Results and Discussion

This section presents the study's results and provides a discussion of the findings concerning the research objectives. The data are analyzed, interpreted, and compared with relevant literature to highlight significant patterns, implications, and insights. The presentation aims to clarify how the study's outcomes address the research questions and contribute to a deeper understanding of the topic.

3.1 Views of Public -School Leading Administrators on Leading 21st Century Teachers

Presented in Table 1 is the thematic analysis of Qualities of Public-School Administrators in Leading 21st Century Teachers. The researcher of the study utilized the Qualitative Interpretation Technique using the 6 Phases of Thematic Analysis by Braun and Clark (2006). The views of Qualities of Public-School Administrators are: Elevating Effective Teaching Practices and Excellent Leadership, Personal Growth and Professional Development, and Nurturing Safe Spaces for Better Relationships.

Table 1: Thematic Analysis of the Views on the Qualities of Public-School Administrators in Leading 21st Century Teachers

Essential Theme	Cluster Theme
Elevating Effective Teaching Practices and Excellence Leadership	Strategic Observation and Environment Management
	Assistance and Innovation
	The Role of Technology
	Transformational and Dignified Leadership
	Resource Sharing
	Coaching and Mentoring
	Training and Workshops
Personal Growth and Professional Development	Self-assessment
	Peer Assessment
	Team Effort and Networking
	Varied Educational Experiences
	Intellectual and Emotional Maturity
	Lifelong Learning and Commitment
Nurturing Safe Spaces	Openness

for Better Relationships	Trust and Confidence Cultivation
	Constructive Criticism

3.1.1 Elevating Effective Teaching Practices and Excellent Leadership

This theme emphasizes the importance of raising classroom instruction and educational leadership standards to ensure student success. It suggests a holistic approach to school improvement, where strong, effective leadership supports and amplifies teaching excellence.

As one participant shared, in terms of their teaching: "*I really conducted classroom observations to guide them on what to do in their classes so they can enhance whatever methods and strategies are appropriate for their teaching*" (P2). Another participant emphasized the importance of teaching practice and leadership: "*As a Master Teacher, I believe I can support my school head, particularly in my role related to the curriculum. I can assist in observing teachers through classroom observations. As I mentioned earlier, we also team up during observations and mentoring sessions and provide technical assistance, especially during free periods*" (P4).

Furthermore, effective teaching practice and excellent leadership are required. "*There are actually a lot of ways that we could use what we know and what we have. And one of which is through the technical assistance and through in-service trainings or SLAC sessions wherein I could share or impart what I know and what I have to my co-teachers*" (P10). When leaders actively involve teachers in shaping how diversity is addressed in the classroom, it not only helps teachers develop a stronger sense of who they are as educators but also strengthens their sense of belonging and purpose within the school (Grooms *et al.*, 2021).

3.1.2 Personal Growth and Professional Development

Personal Growth and Professional Development work hand in hand—personal growth shapes who you are, and professional development sharpens what you do. Together, they help individuals reach their full potential and contribute meaningfully to their work and community, as one participant expressed, "*One way to better support our 21st-century teachers is to consistently engage them in professional learning communities. Through these communities, they stay updated with the latest developments in education, including new teaching strategies and the most appropriate methods for specific groups of learners. They also learn how to manage classrooms effectively and adapt to different teaching approaches. So, by involving them in professional learning communities, we are helping them grow and improve in their profession*" (P8).

Another participant emphasized the relevance of Personal Growth and Professional Development: "*As administrator, it is our duty to make them grow, to make them meaningful and productive in their career. One thing is for sure: for me, for them to grow professionally and productively in their teaching career, promotion and great motivation in the field of teaching are important. Because for me, if they are motivated enough, they have this so-called driving force of being a teacher, a call, a vocation of being a teacher, then I can stand my ground that in the near future, we will bring together the promotion that is given to them from different levels. This means that we will journey with each other not only financially but also in*

all aspects of our being, and we will grow. That's the very essence of leadership, to make them grow and also the benefits for us as a leader" (P13). One final remark emphasized collective responsibility: *By encouraging them to join some trainings, not to refuse those offers because of experiences, sometimes chances, sometimes come once in a lifetime. Also, they suggest that they proceed to get a master's education or a doctoral degree, whatever you call it. In that way, they can discover themselves and their potential. Who knows, they do not fall into becoming only a classroom teacher. Maybe they can handle schools like you* (P5).

The statement highlights that authentic leadership—shown through consistent actions and a supportive culture—earns the trust and respect of teachers. When leaders model what they expect and genuinely support growth, they inspire others to follow and improve as well (Mutune, 2019).

Nurturing Safe Spaces for Better Relationships leads to stronger, more trusting, and supportive relationships. It encourages emotional well-being, open communication, and collaborative growth—key foundations for thriving communities, schools, and workplaces.

One participant put it succinctly, reflecting the perceived safety of workspaces for effective collaboration. *"Oh. So, the question is, what are the things a master teacher could do to help subordinates by leading by example and showing an example that this should be done this way and not that way? For instance, during observation, class observation, being the master teacher, I should make myself be observed before others, before I observe the others"* (P5) Another participant elaborated on this relevance, stating: *"The only way that a subordinate feels convenient or comfortable being with his or her superior is that... when his or her school administrator is not intimidating... he or she is approachable... I think that spells the difference*". (P6) These insights emphasize the participants' developing consciousness around how a good work environment intersects with their lived experiences. Such reflections are consistent with current research. The head teachers are responsible for providing a conducive learning environment and retaining talented teachers. Head teachers have a crucial role in these operations (Abdalla, 2020).

3.1.3 Item Pool and Expert Opinion

The determination of the factors of qualities of public-school administrators started with the formulation of the item statements through the readings of the review of related studies and in-depth interviews with the research participants. The Item Pool of Statements (IPS) was content analyzed by the dissertation adviser and ten experts. The ten experts who rated the items have finished their doctoral degrees. These experts were chosen for their wide range of experiences in leading 21st-century teachers, textual analysis, psychology, and counseling. The experts were asked to rate the items using Lawshe's (1975) criteria (essential, useful but not essential, not necessary). From the expertise of the content validators, the achievement of the content validity of the items depends on the agreement of the validators. As required by Lawshe, the ten-panel of experts should agree on the validity of an item at least 0.80. Those items that did not pass the minimum validity will be subjected to revision or elimination. Shown in Table 2 is

the number of items of the subscale of Qualities of Public-School Administrators in the three-phase item development.

Table 2: Tentative Number of Items of the Subscale of Qualities of Public-School Administrators in the Three-Phase Item Development

Sub-scale	Number of Items		
	Phase 1: Literature Analysis and in-depth Interview	**Phase 2: Adviser's Revisions**	**Phase 3: Experts' Validation**
1. Elevating Effective Teaching Practices and Excellent Leadership	20	20	20
2. Personal Growth and Professional Development	20	20	20
3. Nurturing Safe Spaces for Better Relationships	20	20	20

3.1.4 Measures of Sampling Adequacy and Sphericity

Provided in Table 3 are the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity. Kaiser-Meyer-Olkin (KMO) is a statistical method in which the value is used to determine if the sample size is adequate for factor analysis (Matore *et al.*, 2019). For this study, the Kaiser-Meyer-Olkin (KMO) score of 0.76 indicates that the sample size is meritorious, which means adequate and highly correlated; thus, factor analysis is optimal for the data set. It indicates that the degree of information among the variables overlaps greatly with a strong partial correlation. Hence, it is plausible to conduct factor analysis. A KMO score of >0.8 means that the sample size is adequate for factor analysis (Ul Hadi *et al.*, 2016).

Table 3: Sampling Adequacy and Multidimensionality Test for Qualities of Public-School Administrators

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.76
Bartlett's Test of Sphericity	**Approx. Chi-Square**	11562
	df	1153
	Sig.	0

On the other hand, Bartlett's Test of Sphericity is another statistical method that tests whether there is an overall significance of all correlations among all items on the instrument being used (Effendi *et al.*, 2019). Moreover, Bartlett's Test of Sphericity compares an observed correlation matrix to the identity matrix. It checks to see if there is a certain redundancy between the variables that can be summarized with a few factors. As indicated in Bartlett's Test of Sphericity provided in Table 1, the degree of freedom value is 1153, and a p-value of .000 indicates that the data set is not identical and is considered multivariate; thus, factor analysis is the most appropriate method to determine the factors characterizing qualities of public-school administrators in leading

21st-century teachers. The significant statistical test of .000 shows that the correlation matrix is not an identity matrix (rejection of the null hypothesis), as represented in the table above. The standard result of exploratory factor analysis can be identified using the latent root criterion by explaining the total value of the variances. The total variance explained shows the result by identifying the value of the eigenvalues of the factors and the variance of each factor.

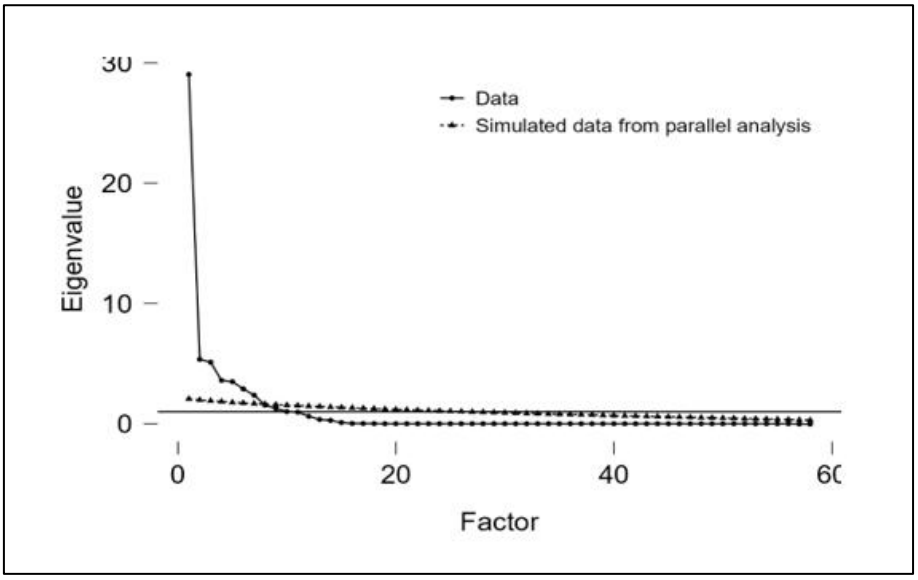


Figure 3: Screen Plot of Qualities of Public-School Administrators in Leading 21st Century Teachers

3.1.5 Latent Roots Criterion of the Extracted Factors

Provided in Table 4 below were extracted factors characterizing qualities of public-school administrators in leading 21st-century teachers after rotated components were applied. Results of the latent root criterion in Table 4 reveal that five factors can be extracted from the set of items submitted for factor analysis, which means only five dimensions or constructs that measures the factors characterizing qualities of public-school administrators in leading 21st century teachers after rotations, as the five and so on constructs failed to provide at least three variables (Effendi *et al.*, 2019).

The first factor is transformational educational leadership with a rotation sum of squared loading of 29.006 and an eigenvalue of 29.038. The second factor is supportive and collaborative educational leadership with a rotation sum of squared loading of 5.332 and an eigenvalue of 5.354. The third factor is professional commitment and leadership development with rotations, with a sum of squared loading of 5.079 and an eigenvalue of 5.112. The fourth factor is instructional leadership and teacher support, with rotations, sums of squared loading of 3.58, and an eigenvalue of 3.603, and the fifth factor is mentorship and professional development leadership, with rotations, sums of squared loading of 3.475, and an eigenvalue of 3.497. The aggregate percentage of variance suggests that the extracted factors can explain 3.314 overall variability of the factors characterizing qualities of public-school administrators in leading 21st-century teachers.

Table 4: Latent roots criterion of extracted factors

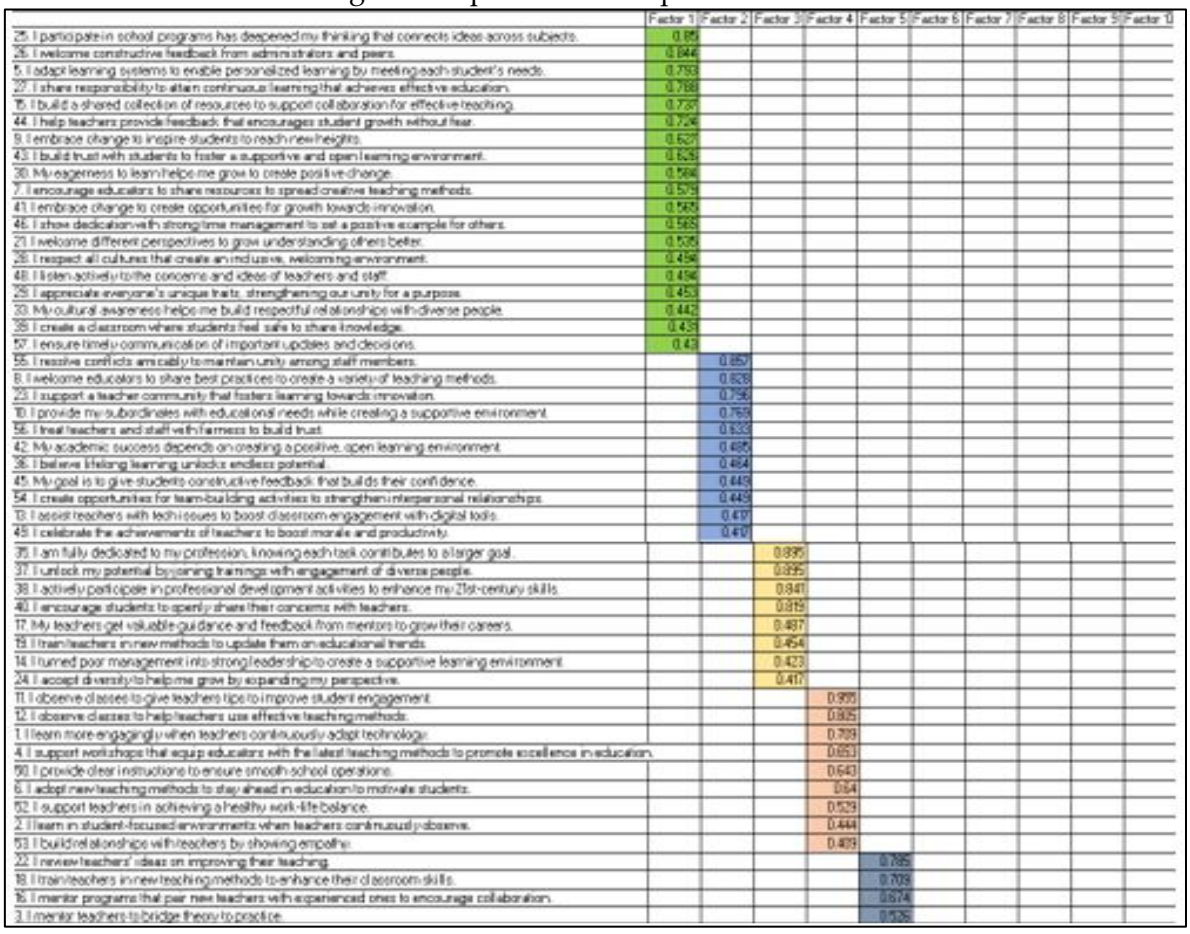
Factors	Eigenvalues	SumSq. Loadings	Cumulative
Factor 1	29.038	29.006	0.5
Factor 2	5.354	5.332	0.592
Factor 3	5.112	5.079	0.68
Factor 4	3.603	3.58	0.741
Factor 5	3.497	3.475	0.801
Factor 6	2.895	2.832	0.85
Factor 7	2.368	2.346	0.891
Factor 8	1.548	1.48	0.916
Factor 9	1.261	1.225	0.937
Factor 10	1.012	0.926	0.953

3.1.6 Extracted Factors Characterizing Qualities of Public Schools Administrators in Leading 21st Century Teachers

Provided in Table 4 are the variables that remained from the factors characterizing students' attitudes toward learning social studies after extraction and retention methods were utilized during the interpretation of the data gathered. Qualified variables are those variables that reach the threshold of >0.40. Factor loadings with <0.4 were considered for elimination (Lee Chan & Idris, 2017). Moreover, variables with a factor loading higher than 0.5 are grouped under a factor (Balasundaram, 2009). On the other hand, a variable with a factor loading of 0.6 remains, as it indicates the usefulness of measuring a particular construct (Effendi *et al.*, 2019).

Provided in Table 4 is a total of 60 original items being surveyed and processed through data reduction analysis. Principal component analysis (PCA) determines whether certain items measure common factors. In addition, factor rotation simplifies the rows and columns of the factor matrix and maximizes a variable's loading on a single factor to facilitate interpretation (Hair *et al.*, 2006). Principal component analysis for the extraction method and VARIMAX with Kaiser-Meyer-Olkin normalization were utilized. After eigenvalue, only 51 items qualified as a factor, and the other nine items still needed to qualify for the minimum requirement of 0.40 to be considered as a factor. Factor loadings with <0.4 were considered for elimination (Lee Chan & Idris, 2017). On the other hand, a variable with a factor loading of 0.6 remains, as it indicates the usefulness of measuring a particular construct (Effendi *et al.*, 2019). The six items suppressed upon rotation did not pass the coefficient values set; thus, they are eliminated from the analysis. The following items are eliminated, such as number 58. I address conflicts or misunderstandings promptly through open communication, 51. I communicate expectations effectively to align staff efforts with school goals, 34. I foster a culture of collaborative learning among teachers and staff 32. I love my work, which makes each day enjoyable 47. I stay approachable to foster a supportive and positive school environment, and 20. I encourage teachers to reflect, promoting self-evaluation for growth. The factors are then labelled according to the nature of each item in one structure by looking at the commonality of the items loaded into their respective factors.

Table 5: Factor loading on the qualities of the public-school administrators' model



3.1.7 Extracted Factors Characterizing Qualities of Public Schools Administrators in Leading 21st Century Teachers

Table 6 in the research findings presents a comprehensive thematic analysis of the item statements of Commitment to Lifelong Learning and Professional Growth, which is the first factor that explains 29.038 percent of eigenvalues. The statement from Iskak and Paalisbo (2019) highlights how the role of school principals has evolved in the 21st century. Traditionally, principals were primarily responsible for implementing educational policies, managing school operations, and ensuring academic achievement. However, in today's rapidly changing world, their role has expanded significantly. Iskak and Paalisbo suggest that the modern principal is a holistic leader—someone who balances educational leadership with mentorship and personal development responsibilities to meet the complex needs of 21st-century learners.

Table 6: Factor 1 - Commitment to Lifelong Learning and Professional Growth

Item Number	Item Statements	Coefficients
I26	I welcome constructive feedback from administrators and peers.	0.844
I27	I share responsibility for attaining continuous learning that achieves effective education.	0.788
I9	I embrace change to inspire students to reach new heights.	0.627

I25	I participate in school programs, which have deepened my thinking that connects ideas across subjects.	0.85
I30	My eagerness to learn helps me grow to create positive change.	0.584
I41	I embrace change to create opportunities for growth towards innovation.	0.565
I46	I show dedication and strong time management skills to set a positive example for others.	0.565

Table 7 in the research findings presents a comprehensive thematic analysis of the item statements of Collaboration and Support Among Staff/Teacher, which is the second factor that explains 5.354 percent of eigenvalues. Grooms *et al.* (2021) highlight that when school leaders create opportunities for teachers to engage in diversity-related dialogue, they not only support the teachers' identity development but also strengthen the overall sense of inclusion and community within the school. The statement from Grooms *et al.* (2021) emphasizes the important role that school leaders play in shaping both teacher identity and school culture, especially when it comes to diversity and inclusion.

Table 7: Factor 2 – Collaboration and Support Among Staff/Teacher

Item Number	Item Statements	Coefficients
I55	I resolve conflicts amicably to maintain unity among staff members.	0.857
I8	I welcome educators to share best practices to create a variety of teaching methods.	0.828
I23	I support a teacher community that fosters learning towards innovation.	0.796
I10	I provide my subordinates with educational needs while creating a supportive environment.	0.769
I56	I treat teachers and staff with fairness to build trust.	0.633
I54	I create opportunities for team-building activities to strengthen interpersonal relationships.	0.449
I13	I assist teachers with tech issues to boost classroom engagement with digital tools.	0.417
I49	I celebrate the achievements of teachers to boost morale and productivity.	0.417

Table 8 in the research findings presents a comprehensive thematic analysis of the item statements of Capacity Building for Educational Excellence, which is the third factor that explains 5.112 percent of eigenvalues. The statement from Gülbahar (2020) and Paul (2020) emphasizes the crucial role that principal-teacher communication and collaboration play in shaping a school's overall success and the professional development of teachers. Gülbahar and Paul (2020) stress that the way principals communicate and collaborate with teachers is fundamental to teacher development, school improvement, and maintaining positive, productive relationships within the school community.

Table 8: Factor 3 - Capacity Building for Educational Excellence

Item Number	Item Statements	Coefficients
I35	I am fully dedicated to my profession, knowing each task contributes to a larger goal.	0.895
I37	I unlock my potential by joining trainings with the engagement of diverse people.	0.895
I38	I actively participate in professional development activities to enhance my 21st-century skills.	0.841
I17	My teachers get valuable guidance and feedback from mentors to grow their careers.	0.487
I19	I train teachers in new methods to update them on educational trends.	0.454
I14	I turned poor management into strong leadership to create a supportive learning environment.	0.423

Table 9 in the research findings presents a comprehensive thematic analysis of the item statements of *Instructional Support and Teaching Improvement*, which is the fourth factor that explains 3.603 of the eigenvalues. According to Kerri K. Titone (2017), in her work *"Teacher and Administrator Qualities that Facilitate Innovation in 21st Century Schools,"* the success of modern education depends heavily on creating an innovative school framework—a structure that encourages and supports new ideas, creativity, and continuous improvement in both teaching and leadership. Titone (2017) explains that fostering innovation within a school's structure directly contributes to the advancement of teaching and leadership. This approach helps educational institutions meet the evolving demands of 21st-century learning and prepares both educators and students for future success.

Table 9: Factor 4 - Instructional Support and Teaching Improvement

Item Number	Item Statements	Coefficients
I11	I observe classes to give teachers tips to improve student engagement.	0.955
I12	I observe classes to help teachers use effective teaching methods.	0.805
I1	I learn more engagingly when teachers continuously adapt technology.	0.709
I4	I support workshops that equip educators with the latest teaching methods to promote excellence in education.	0.653
I50	I provide clear instructions to ensure smooth school operations.	0.643
I6	I adopt new teaching methods to stay ahead in education and to motivate students.	0.64
I2	I learn in student-focused environments when teachers continuously observe.	0.444

Table 10 in the research findings presents a comprehensive thematic analysis of the item statements of Mentoring and Instructional Coaching, which is the fifth and last factor that

explains 3.487 percent of eigenvalues. According to Sonsaard and Darbavasu (2019), the development and application of modern administrative skills are vital for school leaders to effectively manage and advance schools in the 21st century. These skills enable administrators to navigate complexity, drive innovation, and ensure educational excellence. Tony Bush (2006) emphasizes that effective educational leadership is more than administration—it is strategic, developmental, and people-focused management. Mentorship and professional development leadership embody this theory by supporting the growth and empowerment of teachers, fostering collaboration and reflective practice, and promoting a culture of continuous improvement—core elements of good practice in 21st-century educational management.

Table 10: Factor 5 - Mentoring and Instructional Coaching

Item Number	Item Statements	Coefficients
I18	I train teachers in new teaching methods to enhance their classroom skills.	0.709
I16	I mentor programs that pair new teachers with experienced ones to encourage collaboration.	0.674
I3	I mentor teachers to bridge theory to practice.	0.526

3.1.8 Measurement Model of Qualities of Public-School Administrators

Confirmatory Factor Analysis (CFA) is used to test whether the measurement model is consistent with the Exploratory Factor Analysis that was run in the previous section. Typically, CFA is used in a deductive mode to test a hypothesis regarding unmeasured sources of variability responsible for the commonality among test scores in terms of relationships among the constructs. The number of factors and pattern of loading are hypothesized before the analysis, and numerous restrictions are placed on the solution (Hoyle, 2000). If constraints imposed on the model are inconsistent with the sample data, the results of the statistical model fit will indicate a poor fit, and the model will be rejected.

Before conducting a Confirmatory Factor Analysis (CFA), researchers consider several critical assumptions. First, regarding sample size, a minimum N of 300 is often preferred as larger sample sizes help achieve accurate parameter estimates and enhance model stability (Goretzko *et al.*, 2023). Second, for distribution properties, CFA assumes multivariate normality; however, robust methods like diagonally weighted least squares (DWLS) can handle ordinal data and modest violations of normality effectively (Cheng-Hsien Li, 2016). Third, on the measurement scale, commonly used maximum likelihood estimators require data measured on a continuous scale, while DWLS is suitable for ordinal or Likert-scale data (Goretzko *et al.*, 2023). Lastly, in terms of the type of indicator, CFA assumes that indicators reflect latent factors, with their relationships determined by covariation patterns. Modern practices recommend careful assessment of model fit using indices like RMSEA, CFI, and TLI to validate these assumptions (Pristianti, 2022).

Table 11: Model Fit Indices

	x^2	X2/df	CFI	TLI	RMSEA	PCLOSE
Initial Results	-11053.19	-	-	-	-	-
Model 1 (Delete highly correlated factor)	1035.381	24.071	0.828	0.780	0.258	0.00
Model 2 (Delete highly correlated factor)	3786.916	32.646	0.678	0.575	0.302	0.00
Model 3 (Correlated error term)	34.278	2.287	0.995	0.969	0.063	0.043
Acceptable Values		<3.00	0.90	0.90	<0.08	<0.05
Good Fit Values	p<0.05		0.95	0.95	<0.08	<0.05

Table 11 shows the Model Fit Indices of the qualities of public-school administrators (Nine Factor Rotation). Using AMOS 20 software, some of the obtained values for model 1 were $\chi 2/df = 24.071$, CFI=0.828, TLI = 0.780, and RMSEA= 0.258. For model 2, $\chi 2/df = 32.646$, CFI=0.678, TLI = 0.575 and RMSEA = 0.302. For model 3, $\chi 2/df = 2.287$, CFI=0.995, TLI = 0.969 and RMSEA = 0.063. Since some of the measures of good fit do not satisfy the requirement, the researcher checks different requirements for the measurement model.

The researcher comes up with different trials to come up with the best-fit model of meaningful learning. The relevance of determining the best fit model in terms of fitting the observed data collected ensures that the model is an exact reflection of the qualities of public-school administrators in leading 21st century teachers. The researcher is guided by the different model fit indices such as the goodness of fit index (GFI) and the Root Mean Square Error of Approximation (RMSEA). GFI ranges from 0 to 1.0 and indexes the relative amount of the observed variance and covariance accounted for by the model; values greater than 0.9 are viewed as indicative of a good fit (Tanaka, 1993). RMSEA indexes the degree of discrepancy between the observed and implied covariance matrices per degree of freedom. The minimum value of RMSEA is 0.05; Browne and Cudeck (1983) propose 0.05 as a value indicative of close fit, 0.08 as indicative of marginal fit, and 0.10 as indicative of poor fit of a model, considering the degrees of freedom of the model.

In figure 4, the first attempt of the researcher is to delete factors with an interrelationship of more than 0.85. A value of more than 0.85 means the factor has an issue of multicollinearity (Hoyle, 2000); thus, the researcher one by one deleted those latent factors with a value of more than 0.85. For the modification, factor 1, which is Commitment to Lifelong Learning and Professional Growth (CLLPG), was deleted, and factor 3, which is Capacity Building for Educational Excellence (CBEE), was added. It can be observed in the final model that the interrelationships between latent factors passed the threshold of 0.5 - 0.85. This implies that the factors in terms of discriminant validity measure in the same direction as the other latent variables. Further, it shows the extent to which the factors of the qualities of public-school administrators are distinct and uncorrelated. The rule is that variables should relate more strongly to their own factor than another one (Hoyle, 2000).

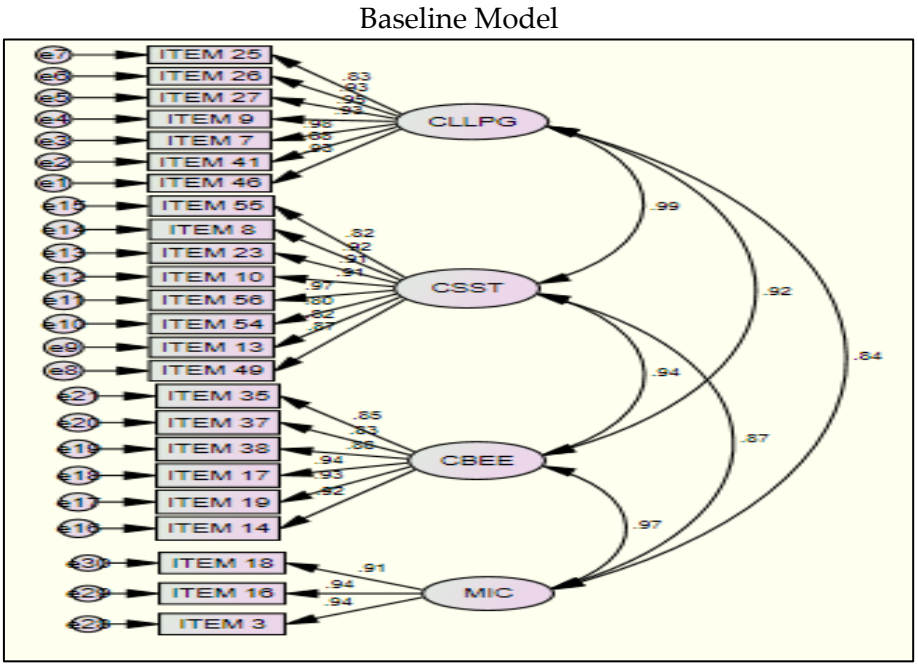


Figure 4: Model fit indices of the qualities of public-school administrators (4 factors first-order)

The researcher correlated the error terms of the same dimension as provided by the modifications index. Confirmatory Factor Analysis involves some manner of specification, which, in the typical instance, involves either freeing fixed parameters or, less commonly, fixing free parameters in the initially specified model (Bollen & Long, 1993). Further, the researcher deleted factor 1 1 which is Commitment to Lifelong Learning and Professional Growth (CCLPG), had an item number of 25,26,27,9,7,41,46, and factor 3, which is Commitment to Lifelong Learning and Professional Growth (CBEE), had an item number of 35, 37, 38, 17, 19, 14, which the researcher believes does not measure that factor and increases its validity.

In Figure 5, the 2-factor first-order model, Factor 1 – Collaboration and Support Among Staff/Teacher (CSST) had eight statements (55, 8, 23, 10, 56, 54, 13, 49). The factor 2 – Mentoring and Instructional Coaching (MIC) had three statements (18,16,3). It can be observed in the final model that the interrelationships between latent factors passed the threshold of 0.5 - 0.85. This implies that the factors in terms of discriminant validity measure in the same direction as the other latent variables. Further, it shows the extent to which the factors of the qualities of public-school administrators are distinct and uncorrelated. The rule is that variables should relate more strongly to their own factor than to another one (Hoyle, 2000). The Confirmatory Factor Analysis helps us analyze each construct's internal consistency and convergent validity. The results, outlined in Table 11, revealed that all item statements significantly contribute to different factors, as indicated by a p-value < 0.05. This implies that each item serves as an excellent measure of its corresponding indicator of the qualities of public-school administrators.

Final Model

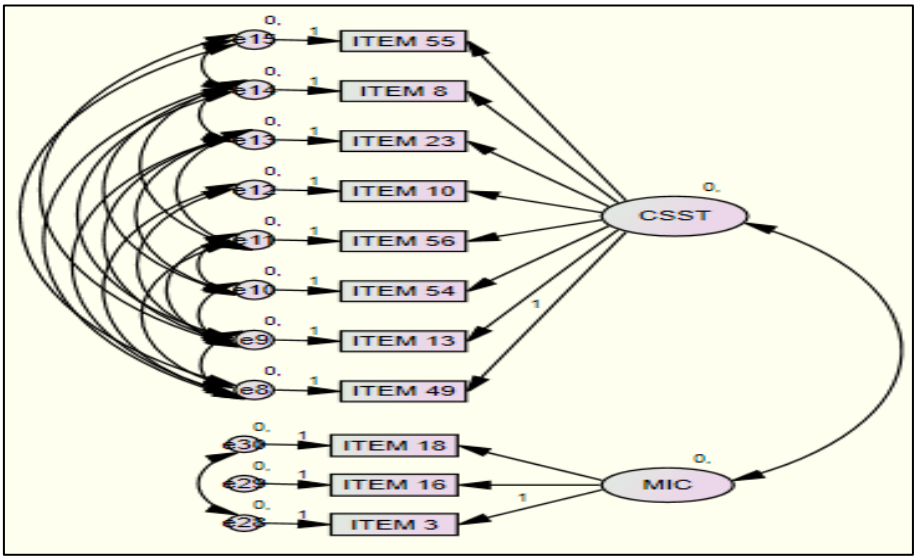


Figure 5: Model fit indices of the qualities of public-school administrators (2 factors first-order)

To ascertain convergent validity, the researcher meticulously examined all factors involved in the study. As depicted in Table 12, each latent construct, including Collaboration and Support Among Staff/Teacher and Mentoring and Instructional Coaching, demonstrated statistical significance. This implies that the measures chosen by the researcher effectively converge upon the intended aspects of the qualities of public-school administrators. Convergent validity, in this context, refers to the degree to which different measures theoretically expected to be related indeed exhibit significant associations.

Table 12: Covariance of the Factors

			Estimate		**C.R.**	**P**
MIC	<-->	CSST	.323	.029	10.982	***

The researcher's meticulous examination confirms that multiple indicators within each construct align and converge on common ground, substantiating the validity of the measurement model. Further, this compelling outcome indicates a robust and satisfactory level of convergent validity in our study (Gerbing & Anderson, 1988). The significance of these latent constructs affirms that our chosen measures effectively converge upon the intended aspects of the qualities of public-school administrators. This alignment is crucial as it demonstrates that multiple indicators within each construct converge on a common conceptual space, supporting the overall validity of our measurement model.

Table 13: Reliability Coefficients

Sub-scale	Number of Items	Cronbach's Alpha
1. Collaboration and Support Among Staff/Teacher	8	0.867
2. Mentoring and Instructional Coaching	3	0.850
Total Scale	**11**	**0.880**

3.1.9 Reliability Tests for Derived Dimensions

Thompson and Levitov in Matlock-Hetzel (2010) proposed that the quality of a test can be evaluated by computing its reliability, which refers to the consistency of results when administered to the same groups under the same conditions. Reliability is the degree to which an assessment consistently measures what it intends to measure (Airasian & Russell, 2001). Table 12 highlights the level of reliability of qualities of public-school administrators and their dimensions, with coefficients ranging from 0.850 to 0.867 and an overall reliability of 0.880. According to standards in educational assessments, a reliability value above 0.70 indicates a very good test (Annavajjhala, Dargel, Kuwahara, & Raza, 2010).

Reliability is a cornerstone of psychometric evaluation, ensuring test scores remain consistent across replications. Miller (2019) emphasized that reliability is a foundation for validity and is critical when assessments are used to make high-stakes decisions. Various factors, such as the test format, the group's homogeneity, and the items' clarity, can influence reliability. Internal consistency measures, such as Cronbach's alpha, are widely used to evaluate reliability. Ferketich (1990) highlighted that high internal consistency indicates that test items measure a cohesive construct, enhancing the test's utility. Practical strategies to enhance reliability include increasing test length, refining item clarity, and using consistent scoring methods. Pipia (2014) stressed the importance of reducing measurement error to ensure reliability and validity.

3.1.10 Measure of Qualities of Public Schools Administrators in Leading 21st Century Teachers

Table 14 presents the validated scale measuring qualities of public-school administrators in leading 21st-century teachers, categorized into two key dimensions: Collaboration and Support Among Staff/Teacher and Mentoring and Instructional Coaching. Each dimension represents crucial aspects of how qualities of public-school administrators engage with and internalize in leading 21st-century teachers and culturally responsive leadership.

Table 14: Scale to Measure the Qualities of Public-School Administrators in Leading 21st Century Teachers

Collaboration and Support Among Staff/Teacher	
Item Number	**Item Statements**
55	I resolve conflicts amicably to maintain unity among staff members.
8	I welcome educators to share best practices to create a variety of teaching methods.
23	I support a teacher community that fosters learning towards innovation.
10	I provide my subordinates with educational needs while creating a supportive

	environment.
56	I treat teachers and staff with fairness to build trust.
54	I create opportunities for team-building activities to strengthen interpersonal relationships.
13	I assist teachers with tech issues to boost classroom engagement with digital tools.
49	I celebrate the achievements of teachers to boost morale and productivity.
Mentoring and Instructional Coaching	
Item Number	**Item Statements**
18	I train teachers in new teaching methods to enhance their classroom skills.
16	I mentor programs that pair new teachers with experienced ones to encourage collaboration.
3	I mentor teachers to bridge theory to practice.

Collaboration and Support Among Staff/Teacher dimension emphasizes creating opportunities for team-building activities to strengthen interpersonal relationships and treat teachers and staff fairly to build trust. Items like "I resolve conflicts amicably to maintain unity among staff and "I provide my subordinates with educational needs while creating a supportive environment". These dimensions welcome educators to share best practices to create a variety of teaching methods that support a teacher community that fosters learning towards innovation and assist teachers with tech issues to boost classroom engagement with digital tools. This suggests that when public-school administrators lead by celebrating the achievements of teachers, it boosts morale and productivity.

Finally, Mentoring and Instructional Coaching help mentor teachers to bridge theory to practice and train teachers in new teaching methods to enhance their classroom skills. This suggests mentor programs that pair new teachers with experienced ones to encourage collaboration.

3.1.11 Qualities of Public-School Administrators in Leading 21st Century Teachers Collaboration and Support Among Staff/Teachers

This dimension focuses on fostering a school environment where teachers work together, share expertise, and support one another to improve teaching and learning. Effective school leaders emphasize the value of teamwork, mutual trust, and shared goals to build a strong professional culture. Collaboration is crucial for creativity, flexibility, and ongoing development in the educational environment of the twenty-first century. Teachers feel more connected and empowered when encouraged to participate in peer mentorship, co-teaching, Professional Learning Communities (PLCs), and collaborative decision-making. Teachers can reflect on their practices, embrace new tactics, and address the different needs of students when supportive leadership is in place to offer time, resources, and encouragement for such collaboration.

There is a stronger sense of positive school membership among teachers when leaders are given chances to impact discussions on diversity in their classroom (Grooms *et al.*, 2021). A key element in the growth of the schools, the value of education, and the positive and productive working relationships between the stakeholders is the structure,

impacts, and communication between the principal of the school and the instructors for professional development for teachers. (Gülbahar (2020); Paul (2020). Further, according to Titone (2017), Teacher and Administrator Qualities that Facilitate Innovation in 21st Century Schools, an innovative school's framework fosters the improvement of teaching and leading of an institution in the 21st-century generation.

3.1.12 Mentoring and Instructional Coaching

Essential strategies for developing the professional capacity of 21st-century teachers. This dimension emphasizes personalized support, continuous improvement, and the transfer of knowledge and skills through collaborative relationships.

Further, Mentoring and instructional coaching are key drivers in teacher development, enabling educators to grow through guidance, collaboration, and reflective practice. These strategies build teacher confidence, competence, and capacity to meet the evolving demands of 21st-century education. According to Iskak and Pa-alisbo (2019), school principals' responsibilities in the twenty-first century have expanded to include parenting the next generation and preparing them for a world that is changing quickly, rather than just carrying out educational goals and objectives.

Finally, Sura Sonsaard and Sajeewan Darbavasu's (2019) theory on the administrative skills of modern school administrators highlights the distinction between management and administration in relation to the theory of good practice and its nature, highlighting the critical skills required for the development of modern school management in the twenty-first century (Tony Bush, 2006).

4. Conclusion and Recommendation

The study comprehensively explored the views on the qualities of public-school administrators in leading 21st-century teachers in Region XI. It successfully identified and validated the dimensions of qualities of public-school administrators, established a reliable dimension scale, and anticipated a best-fit model using rigorous procedural approaches, including in-depth interviews, Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA). Further, the results of CFA confirm the consistency of the measurement model based on the EFA findings, reflecting a robust internal structure for measuring qualities of public-school administrators. The final model identified two key latent dimensions: Collaboration and Support Among Staff/Teacher, Mentoring, and Instructional Coaching.

This model demonstrated strong model fit indices ($\chi 2/df$ $p<0.05$, CFI = 0.95, TLI = 0.95, RMSEA = <0.08, PCLOSE <0.05, validating the theoretical construct of qualities of public-school administrators. The reliability coefficients for these dimensions ranged from 0.850 to 0.867, with an overall scale reliability of 0.880, signifying the scale's robustness and reliability. The study underscores the importance of a quality and shared leadership approach. The identified dimensions reflect the significance of collaboration and support among staff/teachers and mentoring and instructional coaching that fit the

21st-century teachers. These findings align with good practice and the nature and administrative skills of modern school administrators' theories, emphasizing good and shared governance practice as critical to organizational success.

The research findings provide an evidence-based framework for enhancing the qualities of public-school administrators in leading 21st-century teachers. The proposed measurement model offers a valuable tool for providing quality in leading modern teachers. Furthermore, this study sheds light on the vital leadership qualities that public-school administrators need to effectively support, guide, and empower 21st-century teachers. School leaders can foster an environment where teachers thrive and students succeed by promoting collaboration, innovation, and continuous professional development. The robust methodological foundation and significant outcomes of this study contribute to the growing knowledge on leadership education. The validated measurement model guides educators, school administrators, and policymakers in designing interventions promoting meaningful and equitable public school administrators' qualities for 21st-century teachers.

These findings have broader implications for addressing educational leadership disparities and enhancing the overall qualities of public-school administrators.

4.1 Recommendation

The study provides several recommendations for various public-school administrators to enhance and calibrate the qualities of school principals and school heads in leading 21st-century teachers. School administrators will prioritize building a professional culture where collaboration, coaching, and mentorship are embedded into the school system. These practices not only improve teacher performance and satisfaction but also enhance student learning and school-wide effectiveness.

The Central Office will have a crucial role in policy formulation in developing and issuing a National Policy Framework pursuant to the Philippine Professional Standard for Supervisors (PPSS) down to the Philippine Professional Standards for School Head (PPSH) and in relation to the Philippine Professional Standards for Teachers (PPST) on Collaborative Leadership, Mentorship, and Instructional Coaching within two years, they will ensure 100% adoption across all regions and divisions. There will be a program development wherein launching a National Collaborative Leadership and Mentoring Program (NCLMP) by Year 1, they will target at least 80% of school administrators nationwide to undergo structured leadership and coaching training within three years. The central office will conduct a pilot capacity building in establishing a National Instructional Coaching and Leadership Academy that will train and certify at least 500 master teachers and school leaders annually as mentors and instructional coaches. They can also establish Professional Learning Communities (PLCs) in institutionalizing National Professional Learning Communities (N-PLCs) with at least one functional PLC per school by Year 2, and conduct semi-annual evaluations of their collaborative outputs.

Moreover, monitoring and evaluation will play critical insights for this endeavor wherein in developing a Centralized Monitoring System to track implementation of

mentoring and instructional coaching practices, with annual reports showing at least 10% improvement in teacher performance ratings and 5% increase in student learning outcomes over five years and finally, they can conduct a recognition and incentives to the divisions in implementing a National Recognition Program for Exemplary Leadership and Collaboration, awarding at least 10 outstanding divisions and 50 administrators annually for best practices in mentoring, collaboration, and instructional coaching.

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We have no personal, financial, or other interest that could or could be seen to influence the decisions or actions we are taking or the advice we are giving during my research for this.

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References

Airasian, P. W., & Russell, M. K. (2001). *Classroom assessment: Concepts and applications* (4th ed.). McGraw-Hill. Retrieved from https://eric.ed.gov/?id=ED446097

Bartholomew, D. J., Knott, M., & Moustaki, I. (2011). *Latent variable models and factor analysis: A unified approach* (3rd ed.). Wiley. Retrieved from https://onlinelibrary.wiley.com/doi/book/10.1002/9781119970583

Braun V., Clarke V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Candrasari, R., Yorman, Y., Mayasari, N., Yulia, R., & Lake, F. (2023). Visionary leadership in education management: leading toward optimal achievement in the era of independent learning. *Indonesian Journal of Education (INJOE), 3*(3), 451-467. Retrieved from https://injoe.org/index.php/INJOE/article/view/79

Child, D. (1990). *The essentials of factor analysis* (2nd ed.). Cassell. https://books.google.ro/books/about/The_Essentials_of_Factor_Analysis.html?id=rQ2vdJgohH0C&redir_esc=y

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research (3rd ed.).* Thousand Oaks, CA: Sage. Retrieved from https://collegepublishing.sagepub.com/products/designing-and-conducting-mixed-methods-research-3-241842

Ferketich, S. (1990). Internal consistency estimates: Do the numbers really tell you anything? *Research in Nursing & Health*, 13(6), 437–440.

Goretzko, D., Pham, T., & Bühner, M. (2023). Estimating CFA with ordinal data: A comparison of estimation methods. *Structural Equation Modeling: A Multidisciplinary Journal*, 30(1), 1–15.

Gerbing, D. W., & Anderson, J. C. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research*, 25(2), 186–192. https://doi.org/10.1177/002224378802500207

Grissom, J. A., Egalite, A. J., & Lindsay, C. A. (2021). How principals affect Students and schools: A systematic synthesis of two decades of research. New York: The Wallace Foundation. Available at http://www.wallacefoundation.org/principalsynthesis. Retrieved April 5, 2024

Grooms, A. A., Mahatmya, D., & Johnson, E. T. (2021). The retention of educators of color amidst institutionalized racism. *Educational Policy, 35*(2), 180-212. Retrieved April 13, 2024. https://doi.org/10.1177/0895904820986765

Hair, J.F.J.; Black, W.C.; Babin, B.J.; Anderson, R.E.; Tatham, R.L. (2006). *Multivariate Data Analysis; Technometrics*, Prentice Hall. Retrieved from https://books.google.ro/books/about/Multivariate_Data_Analysis.html?id=JlRaAAAAYAAJ&redir_esc=y

Halberg, L., & Santiago, L. J. (2021). Using Narrative Inquiry to Explore Critical Reflection and Self-Awareness in Equity Leadership Development. *Educational Leadership and Administration: Teaching and Program Development, 33*, 18-39. Retrieved from https://files.eric.ed.gov/fulltext/EJ1318526.pdf

Hoyle, R. H. (2000). *Confirmatory factor analysis*. In H. E. A. Tinsley & S. D. Brown (Eds.), *Handbook of applied multivariate statistics and mathematical modeling* (pp. 465–497). Academic Press. Retrieved from

https://www.sciencedirect.com/book/9780126913606/handbook-of-applied-multivariate-statistics-and-mathematical-modeling

Iskak, H. M., & Pa-alisbo, M. A. C. (2019). The 21st-century professional leadership standards of secondary school administrators in Nakhon Nayok, Thailand. *Journal of Education and Learning, 8*(5), 175–179. Retrieved from https://files.eric.ed.gov/fulltext/EJ1229288.pdf

Karimi, S., Ahmadi Malek, F., Yaghoubi Farani, A., & Liobikienė, G. (2023). The role of transformational leadership in developing innovative work behaviors: The mediating role of employees' psychological capital. *Sustainability, 15*(2), 1267. https://doi.org/10.3390/su15021267

Kilag, O. K. T., Malbas, M. H., Nengasca, M. K. S., Longakit, L. J. H., Celin, L. C., Pasigui, R., & Valenzona, M. A. V.N. (2024). Transformational Leadership and Educational Innovation. *European Journal of Higher Education and Academic Advancement, 1*(2), 103-109. https://doi.org/10.61796/ejheaa.v1i2.107

Lee Chan & Noraini Idris, (2017). Cooperative Learning in Mathematics Education, International *Journal of Academic Research in Business and Social Sciences, vol. 7*(3), pages 539-553. http://dx.doi.org/10.6007/IJARBSS/v7-i3/2757

Liu, Y., Bellibaş, M. Ş., & Gümüş, S. (2020). The effect of instructional leadership and distributed leadership on teacher self-efficacy and job satisfaction: Mediating roles of supportive school culture and teacher collaboration. *Educational Management Administration & Leadership*. https://doi.org/10.1177/1741143220910438

Lupinacci, J. J. (2017). Addressing 21st Century challenges in education: An ecocritical conceptual framework toward an egotistical leadership in education. *Impacting Education: Journal on Transforming Professional Practice*, 2(1). https://doi.org/10.5195/IE.2017.31

Matlock-Hetzel, S. (2010). *Basic concepts in item and test analysis*. Texas A&M University. Retrieved from https://eric.ed.gov/?id=ED406441

Matore, E. M., Khairani, A. Z. & Adnan, R. (2019). Exploratory Factor Analysis (EFA) for Adversity Quotient (AQ) Instrument among youth. *Journal of Critical Reviews, 6*(6), pp. 234-242. https://doi.org/10.22159/jcr.06.06.33

Miller, M. D., R. L. Linn, and N. E. Gronlund. (2013). *Measurement and assessment in teaching*. 11th ed. Boston: Pearson. Retrieved from https://www.pearson.com/en-us/subject-catalog/p/measurement-and-assessment-in-teaching/P200000001508/9780137515301?srsltid=AfmBOoqjQhlOimrfw1lZNglMobnmkmEu4HveSJ0SblYQt-iEzGSfHPkh

Mutune, S. S., Onyango, G., & Olembo, J. (2019). Influence of head teachers' supportive leadership practices on teachers' satisfaction in Nakuru and Nairobi catholic private primary schools, Kenya. *African Journal of Education and Practice, 4*(1), 29-45. Retrieved from https://ideas.repec.org/a/bdu/ojajep/v4y2019i1p29-45id858.html

Pipia, E. (2014). Practical strategies for teachers to enhance the degree of reliability and validity in assessment. *Journal of Education, 3*(1), 47-52. Retrieved from

https://www.semanticscholar.org/paper/Practical-strategies-for-teachers-to-enhance-the-of-Pipia/9f9119dc8914559c36c0cd1afad07eab1857fa2c

Pristianti, R. A. (2022). Model fit indices in CFA for Likert-type data. *Journal of Educational Measurement and Evaluation*, 6(1), 12–23.

Shen, J., Wu, H., Reeves, P., Zheng, Y., Ryan, L., & Anderson, D. (2020). The association between teacher leadership and student achievement: A meta-analysis. *Educational Research Review, 31*. https://doi.org/10.1016/j.edurev.2020.100357

Titone, K. (2017). The DNA of 21st-century schools: A mixed methods analysis of teacher and administrator qualities that facilitate innovation. New York, NY: St. John's University. Retrieved from https://files.eric.ed.gov/fulltext/EJ1235769.pdf

Tshabalala, R. (2021). 10 years of values-based leadership https://www.africaleadership.net/10-years-values-based-leadership-rorisang-tshabalala.

Van Dam, K., & Meulders, M. (2021). The Adaptability Scale: Development, internal con sistency, and initial validity evidence. *European Journal of Psychological Assessment, 37*(2), 123-134. https://doi.org/10.1027/1015-5759/a000591

Varela, D. G., & Fedynich, L. (2020). Leading schools from a social distance: Surveying South Texas school district leadership during the COVID-19 pandemic. *National Forum of Educational Administration and Supervision Journal, 38(*4), 1-10. Retrieved from https://www.nationalforum.com/Electronic%20Journal%20Volumes/Varela,%20daniella%20Surveying%20South%20Texas%20School%20District%20Leadership%20NFEASJ%20V38%20N4%202020.pdf

Yukl, G. (2021). *Eighth Edition Leadership in Organizations*. Pearsons. Retrieved from https://nibmehub.com/opac-service/pdf/read/Leadership%20in%20Organizations%20by%20Gary%20Yukl.pdf