

Adopting the principal instructional management rating scale for enhancing instructional delivery in Nigerian schools

Hafsat Aliyu Bada¹, Habibat Abubakar Yusuf², Jumoke Iyabode Oladele³, Peter Babajide Oloba⁴

¹Schools and Colleges Unit, Kwara State Teaching Service Commission, Ilorin, Nigeria

²Department of Educational Management, Faculty of Education, University of Ilorin, Ilorin, Nigeria

³Department of Mathematics, Science and Technology Education, Faculty of Education, University of Johannesburg, Johannesburg, South Africa

⁴Department of Languages, Cultural Studies and Applied Linguistics, Faculty of Humanities, University of Johannesburg, Johannesburg, South Africa

Article Info

Article history:

Received Feb 23, 2025

Revised Sep 21, 2025

Accepted Oct 23, 2025

Keywords:

Instructional leadership
Management rating scale
Principal instructional
Principal leadership in Nigeria
Professional development
Secondary schools
Stakeholder engagement

ABSTRACT

This study explores the validation and application of the principal instructional management rating scale (PIMRS) for enhancing instructional leadership in Nigerian secondary schools. This was achieved by checking its content, face, construct, and reliability, with a focus on how clear the language was and how it related to culture. A sample of 100 secondary school teachers from four schools in North-Central Nigeria participated in this research. Expert reviews ensured content validity, while the instrument demonstrated high reliability, with an overall Cronbach's alpha coefficient of 0.95. The subscales for the three dimensions achieved acceptable reliability: 0.83 for defining the school mission (DSM), 0.87 for managing the instructional program (MIP), and 0.91 for shaping the school learning climate (SLC). The results also showed strong positive relationships between the PIMRS dimensions, which supports the tool's usefulness for evaluating how Nigerian schools handle instructional leadership. This study provides a robust foundation for further research on instructional leadership in Nigeria and offers a validated tool to improve school leadership practices, enhance instructional delivery, and ultimately foster student achievement. The adoption of the PIMRS in Nigerian secondary schools has the potential to drive systemic improvements in school effectiveness and instructional leadership. The findings suggest refining the sub-scales of monitoring halls, venues, and instructional feedback to teachers (IFT) for enhanced reliability. Additionally, capacity-building workshops for principals and integration of PIMRS into leadership training programs, as well as policy adoption for standardized evaluation, are essential for successful implementation and improved instructional leadership.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Corresponding Author:

Jumoke Iyabode Oladele
Department of Mathematics, Science and Technology Education, Faculty of Education
University of Johannesburg
Johannesburg, South Africa
Email: jumokeo@uj.ac.za

1. INTRODUCTION

Education plays a critical role in driving national development, contributing to socio-economic and political stability [1]. Previous studies [1], [2] highlight education as an instrument for national transformation and social reform. To achieve sustainable development, the government invests heavily in educating its citizens [3]. However, the success of any educational system is inextricably linked to the quality

of its educators and the leadership guiding them [4], [5]. In Nigerian secondary schools, the increasing complexity of teaching tasks, coupled with evolving organizational structures, emphasizes the critical role of instructional supervision in achieving educational goals. Research demonstrates that school principals, in particular, can enhance teaching and learning by engaging stakeholders, optimizing resources, and fostering a positive school culture [6]. As instructional leaders, principals translate educational policies into actionable strategies to improve student outcomes [7], [8].

Hallinger and Murphy [9] developed the principal instructional management rating scale (PIMRS), a widely recognized tool that evaluates instructional leadership across three key dimensions: defining the school mission (DSM), managing the instructional program (MIP), and developing a positive learning climate [10]. PIMRS offers a robust framework for evaluating and enhancing instructional leadership. While internationally recognized as a tool for fostering school reform and improving student performance [11], its application in Nigeria remains limited. This gap highlights the need for empirical investigation into the PIMRS's potential to address instructional challenges in Nigerian secondary schools, particularly in the era of rapid technological change and educational reform. Instructional leadership, though multifaceted and complex, is central to the realization of school missions, the management of instructional programs, and the creation of a conducive learning environment [12], [13]. International studies consistently demonstrate its positive impact on teacher performance, student learning, and overall school effectiveness [14]–[16]. However, African countries are gradually adopting this leadership model to address pressing educational challenges [17]. This study explores the adoption of the PIMRS as a tool for enhancing instructional delivery in Nigerian secondary schools. By focusing on the principal's role in instructional leadership, it aims to bridge the gap between theoretical frameworks and practical applications, contributing to the broader discourse on educational reform in Nigeria. The primary aim of this study was to examine and validate the PIMRS instrument for adoption within the Nigerian educational system. To achieve this aim, the following research questions were answered:

- i) What is the reliability of the PIMRS?
- ii) What is the validity of the PIMRS?
- iii) What are the PIMRS instrument's constructs and dimensions in the Nigerian setting using exploratory factor analysis?

Research on leadership styles, like the transformational, distributive, curriculum and teacher leadership, has significantly enhanced our understanding of school effectiveness. While scholars continue to debate the merits of these approaches, there is growing consensus about the essential role of instructional leadership in driving school improvement [18]. Instructional leadership focuses on improving teaching and learning processes, making it essential for achieving school effectiveness. The Nigerian educational context underutilizes the concept of instructional leadership, despite principals' familiarity with some of its core functions. Hallinger and Wang [13] developed the instructional leadership model, widely recognized for its applicability in evaluating principals' leadership practices as adopted in this study. The PIMRS, developed by Ganon-Shilon and Schechter [19], serves as a robust framework for assessing principals' instructional leadership across three dimensions: defining school's mission, managing instructional program, and promoting positive school climate.

Despite extensive validation and application in diverse educational contexts, the PIMRS's use in Nigeria remains limited. This study seeks to address this gap by testing and validating the PIMRS for use in Nigerian secondary schools. The study uses the whole instrument, which is a 35-item questionnaire that covers all three dimensions and the instructional leadership functions that go with them (subscales). Validation is based on expert evaluations to ensure its applicability and reliability in the Nigerian context. The study aims to improve principals' ability to support effective instruction by adapting the PIMRS to the Nigerian educational system. This will lead to better teaching and learning outcomes.

2. LITERATURE REVIEW

A study by Patti *et al.* [20] stresses the significant influence of principal instructional leadership on improving teaching and learning. Recent research has explored how principals' instructional leadership positively shapes teachers' attitudes and behaviors, ultimately affecting the quality of teaching and overall school improvement [21]. Numerous studies have expanded knowledge on the critical role of principals' instructional leadership practices [22], [23], highlighting their importance in achieving educational goals and fostering school reform. Over decades, approaches to instructional leadership have evolved, with increasing recognition of their positive impact on student learning outcomes [24], [25]. Othman and Busari [10] introduced the PIMRS in the United States as a tool for developing and improving teaching and learning with significant interactions are among scholars from the United States, United Kingdom, Australia, China, and Canada. This model emphasizes school reform by leveraging the collaborative efforts of teachers, students,

parents, and school management to achieve educational objectives. The framework consists of three key dimensions: DSM, managing instructional programs, and developing a positive school learning climate (SLC), supported by 10 instructional functions and corresponding subscales [26]. Notably, while the framework identifies principals' roles as instructional leaders, it does not encompass their broader responsibilities beyond instructional management.

Principals typically assume primary responsibility for instructional leadership practices, which they often achieve by delegating authority and interpreting educational policies to align with teaching and learning goals. Instructional leaders foster a positive school culture by promoting self-reflection among teachers and encouraging their professional development [27], [28]. Effective instructional leadership involves consistently articulating and reinforcing the school mission and vision to teachers, particularly during meetings, team teaching sessions, and professional development activities. Principals must also prepare to address emerging challenges, such as integrating new technologies, to facilitate school reform. Previous studies [29], [30] highlighted that instructional leadership practices significantly influence school success, underscoring the principal's role as a key driver of school improvement. Authors in previous study [22], [31] validated the PIMRS in a Chinese context, confirming its adaptability with a 32-item scale tailored to represent Chinese principals' instructional leadership practices in school reforms. Additionally, cross-cultural studies in various countries demonstrate that social norms and cultural heritage play a crucial role in shaping principals' instructional leadership practices [23]. These results make it clear that instructional leadership frameworks need to be changed to fit different cultural and educational settings in order to be more useful and have a bigger impact.

2.1. Principal instructional leadership roles for school effectiveness

2.1.1. Defining school mission

A school's mission encompasses the principal's responsibility to articulate, communicate, and translate the institution's goals for teaching and learning achievements [32]. This involves building a substantive vision that resonates throughout the school community. The two primary functions of this role are framing and communicating school goals. Principals must have a clear mission centered on student learning, actively engaging teachers in this mission to ensure that the stated educational objectives are met. As the foundation for student success, this mission establishes a cohesive and shared direction for all stakeholders [13].

2.1.2. Frame school goals

The principal, as the leader of the school, ensures the effective translation of the school mission into actionable responsibilities for teachers, guiding them toward achieving the school's educational goals. These goals should be informed by both past and current school data on students' academic performance. To enhance clarity and accountability, goals must be expressed in measurable terms and aligned with the school's objectives for student learning outcomes. The principal plays a central role in coordinating these objectives with stakeholders to foster a shared understanding and commitment [13], [32]. Instructional leadership energizes staff by encouraging innovative ideas, improving school resources, and enhancing teachers' professional capabilities. This enables meaningful discussions on school goals and alliance with the school's mission [33], [34]. Goals should be collaboratively set by the principal and teachers while incorporating academic priorities into daily practices to ensure the achievement of learning outcomes [35]. Furthermore, instructional leaders are saddled with the task of equipping teachers with the necessary tools and professional development opportunities to enhance their effectiveness and uphold professional standards. Such efforts significantly correlate with improved student achievement, reinforcing the importance of goal setting as a collaborative and strategic process.

2.1.3. Communicating school goals

Communicating school goals is a critical function of principal leadership, focusing on effectively conveying the school's vital objectives to all stakeholders. The principal ensures that the goals are clearly articulated and regularly discussed with teachers, aligning them with instructional practices, curriculum design, and decision-making processes to enhance learning outcomes [13]. The communication of school goals can occur through both formal and informal channels. Formal methods include goal statements, staff bulletins, and assemblies, while informal approaches may involve parent meetings, teacher discussions, and curriculum conferences. These avenues serve as platforms for fostering a shared understanding of school's vision and facilitating collaborative efforts toward achieving academic excellence [35]. To support the effective implementation of educational programs, principals must ensure the availability of appropriate materials and resources. Observing teachers in the classroom is also a crucial aspect of this role, as it enables principals to provide feedback and guidance, thereby promoting the alignment of instructional practices with the school's goals [36].

2.1.4. Managing instructional program

Managing instructional programs entails the principal's strategic actions, often in collaboration with vice principals, to ensure the effective delivery of the curriculum and the achievement of educational goals. This responsibility includes curriculum coordination, delegating and fostering collaboration among staff, evaluating instructional time, and monitoring the quality and progress of teaching and learning [13], [36]. The principal's primary focus should be on core areas of the educational curriculum to sustain effective teaching and learning, ultimately supporting the attainment of school goals. Principals must consistently actualize and translate the school's vision and objectives into classroom practices at all levels. This involves aligning teachers' instructional objectives with the broader school mission and systematically evaluating classroom practices to maintain high standards of teaching and learning [37]. By actively managing these components, the principal serves as a focal leader in fostering an environment that supports academic excellence and continuous improvement [38].

2.1.5. Coordinating the curriculum

The effectiveness of a school's instructional program is closely tied to the degree of curriculum coordination. A well-coordinated curriculum ensures that the content taught in classrooms aligns with the school's objectives, facilitating the achievement of educational goals across all levels of learning [13]. Effective curriculum coordination is supported by teacher collaboration and active interaction at all levels regarding instructional matters [39], [40]. One of the key responsibilities of the school principal as an instructional leader is to maintain and promote the proper interpretation of the curriculum within the classroom. This involves ensuring that educational objectives are clear and actionable, answering the critical questions of what students need to learn, why it is essential, how it should be taught, and when it should be implemented [38]. By fostering a cohesive approach to curriculum delivery, the principal lays a solid foundation for effective teaching and learning, ultimately driving the school toward its academic goals.

2.1.6. Supervise and evaluate instruction

Supervision and evaluation involve providing instructional support to teachers through structured monitoring of classroom activities. This process may include formal or informal visits to classrooms conducted by the school principal or delegated to subordinates, allowing for observation of both teachers' and students' interactions and activities [41]–[43]. Effective supervision fosters the development of teachers' instructional capacity, ensuring that their teaching practices align with quality standards and educational goals. Principals play a fundamental role in enhancing this capacity by providing targeted feedback, professional guidance, and support that improves the overall quality of instruction [44]. Through consistent supervision and thorough evaluation, instructional leaders help identify areas for improvement while reinforcing strengths, ultimately fostering a culture of continuous professional growth and elevating teaching quality to positively impact student learning outcomes [45].

2.1.7. Monitor student progress

Principal instructional leadership is crucial in monitoring students' progress to inform instructional decisions and provide feedback that enhances learning and supports the attainment of educational objectives. This is often achieved through standardized measures such as tests and assessments [32]. Principals are responsible for sharing relevant assessment results with teachers and parents promptly, ensuring a clear understanding of students' performance. They facilitate discussions with teachers to analyze test results and provide detailed interpretations, helping to identify areas requiring improvement. These collaborative efforts enable teachers to adjust their instructional strategies to better support students' progress [46]. Moreover, principals engage in continuous communication with stakeholders, emphasizing a data-driven approach to enhancing learner outcomes [11].

2.1.8. Develop positive school learning climate

Creating a positive SLC is a critical function of the principal's role in fostering an environment that motivates and supports both teachers and students. This environment should enable active engagement and productivity, ultimately driving teaching, learning, and school improvement. The principal plays a pivotal role in establishing high expectations for translating curriculum objectives into a vibrant school learning culture, emphasizing collaborative teacher involvement. These efforts align with Hallinger and Murphy [9] framework, which emphasizes that student learning, must remain the central focus of all school activities. Principals are tasked with shaping a broader vision that not only prioritizes student outcomes but also actively promotes teachers' professionalism and continuous professional development. By cultivating a supportive and inclusive climate, the principal ensures that both staff and students thrive in an environment conducive to achieving the school's educational goals.

2.1.9. Protect instructional time

The principal, as an instructional leader, plays a crucial role in shaping school-wide policies through the development and enforcement of guidelines that interpret and enhance student learning at all grade levels [13]. One of the principal's key responsibilities is protecting instructional time, which involves optimizing the time allocated for instruction, assessments, and related student activities. This can be achieved through effective communication and supervision between students and teachers. The principal's guidance ensures that the allocation of instructional time is carefully structured, with clear expectations for instructional process, to meet the school's objectives and improve student outcomes [41]. By ensuring that appropriate instructional time is set for both teachers and learners, the principal helps establish clear start and end times for classes while also advising parents on the importance of regular attendance. Additionally, the principal coordinates staff meetings to discuss and optimize the allocation of instructional time, reinforcing its importance in the school's broader educational goals.

2.1.10. Provide incentives for teaching and learning

To achieve the organization's goals and objectives, effective human resource management plays a crucial role through regular appraisals and rewards for employees [47], [48]. In the context of the school system, principals should actively motivate teachers by recognizing and rewarding their hard work, both formally and informally. These incentives can include monetary rewards as well as non-monetary recognition such as praise and acknowledgement of their effectiveness and commitment to the job. Providing such incentives fosters a positive work environment and reinforces teachers' dedication to achieving educational outcomes.

2.1.11. Maintains high visibility

The principal should maintain a strong physical presence throughout all aspects of the school environment. The principal's visibility plays a crucial role in fostering positive interactions with both teachers and students [49]. By dedicating a significant portion of their time to being actively present in classrooms, principals can engage directly with the teaching and learning process. This visible leadership enhances communication and builds rapport, which, in turn, positively affects student behavior, academic performance, and overall classroom instruction [13], [50]. The principal's presence promotes a culture of accountability and support, reinforcing their leadership role in shaping a productive and motivating learning environment.

2.1.12. Promotes professional development

An effective school principal plays a crucial role in fostering professional development by recommending and facilitating training programs that enhance teachers' instructional and pedagogical skills, ultimately leading to improved student learning outcomes [11]. Principals support teachers in various ways by providing opportunities for staff development that align with school goals and contribute to the overall improvement of teaching and learning [13]. By actively leading professional development initiatives, an effective principal organizes and directs key staff training activities such as conferences, workshops, symposiums, observations, and supervisory processes [38], [43]. Furthermore, they demonstrate a strong commitment to improving classroom practice through regular classroom visits and active involvement in teaching and learning with the assistance of teachers [44], [45]. With the reviewed factors with reference to principal instructional leadership roles for school effectiveness, this study described the PIMRS instrument's constructs and dimensions. It employed the exploratory factor analysis to check its reliability and validity in the Nigerian setting.

3. METHOD

3.1. Design

This study adopted the non-experimental descriptive case study design within a quantitative paradigm [45]. The design was adjudged appropriate for examining the construct of instructional delivery effectiveness and the dimension of the PIMRS instrument through the exploratory factor analysis within the Nigerian context.

3.2. Population and sampling

The population for this study were Nigerian teachers, while the target population were secondary school teachers. The sample for this study comprises 10 secondary schools from urban and rural areas of Kwara State, Nigeria. A total of 100 teachers participated in responding to the survey question, out of which 63 (63%) were female and 37 (37%) were male; they were confidently selected from urban and rural areas. Data were collected in July 2023 within 2 weeks. Each vice principal academic in all participating schools received a copy of the questionnaires for record purposes. Participants were assured of the confidentiality of their responses to ensure that the study adhered to the research ethics standards.

3.3. Instrumentation

This study utilizes closed-ended survey questionnaires as the research instrument. The instrument of PIMRS was employed for the study. The 35-item version was validated based on an expert account; the study analyzed the data obtained from PIMRS at the full scale and the 3-dimension levels [13]. The demographic part of the survey explicitly states teachers' gender qualifications, year of experience, and subject taught. All item headings are synonymous: "To what extent does the principal in your school practice the following..." Sample items included "frames the school goals in order for staff to meet them", "discuss school academic goals with teachers", and "ensure that the school achieves the school's curriculum objectives". The item categories range from 1 (almost never) to 5 (almost always). There were 35 items adopted from PIMRS by Hallinger and Murphy [9] with three dimensions: i) to define school mission with eight items; ii) MIP with nine items; and iii) to develop a positive SLC.

The 15 items were used after expert validation in Nigeria. The instrument PIMRS was barely used in a Nigerian context; hence, the study considered it most essential to explore the content and face validity of the instrument questionnaires. The panel of two educational planners in a Nigerian university and two experienced school principals' not included in the sample validates the contents of the measuring instrument if they were suitable and applicable to the research purposes in a Nigerian context. However, items that are not suitable to the Nigerian context were dropped and rephrased to suit the Nigerian educational system and practice by the educator, which does not alter the original meaning of the items. The content validity replicates whether the contents are within the broad range of quality under study, which is usually carried out by experts in the field [31]. Scholars have proved the PIMRS conceptual framework beyond reasonable thought as a comprehensive and satisfactory measure in instructional leadership research in relation to principals' leadership practices in schools around the globe [51], [52].

The fitness of PIMRS items, however, can be suitable for the Nigerian educational system, as well as school principals in Nigeria are familiar with those items, as it is their usual practice, and it is contained in the policy of education. Items such as translating the curriculum to the teachers and students, supervising and elevating students' work, and provision of SLC as it was captured in PIMRS items. Face validity was conducted with the assistance of five teachers who are not included in the sampled schools to assess the face validity of the PIMRS items for the present study. The instrument is open to all bases, ranging from language editing, formatting, and rephrasing the questionnaires to suit the Nigerian context without losing the original meaning of the PIMRS items.

3.4. Data analysis

SPSS software version 25 was used to test the factor analysis of the construct validity, and for reliability assessment, an internal consistency reliability test was used. To test the psychometric properties of the instrument, previous studies have exploited principal component analysis (PCA) [49] using the same instrument of study in different contexts [43], [53]. The present study employed PCA because it is a psychometrically sound procedure and conceptually less complex [54]. The study also used oblique rotation techniques since the PIMRS is a multi-dimensional construct.

4. RESULTS AND DISCUSSION

To ensure reliability and the validity of the PMIRS instrument, a reliability analysis test was conducted. The reliability of the instrument was done through construct validity and reliability [55], [56]. The validity of an instrument is the ability to measure what is expected to measure in a construct [57]. While reliability of an instrument is the extent to which the instrument measures the same variables or constructs over a period of time [57]. Factor analysis serves as the primary statistical test for assessing construct validity, while internal consistency serves as the measure of reliability. The internal consistency reliability test refers to a process for assessing the reliability of scores using only one direction of the instrument [58]. Its purpose is to determine the degree to which the indicators that make up a scale are consistent [59]. Cronbach's alpha is commonly used to measure scale reliability with a coefficient of above 0.70 considered adequate, which suggests that all of the items are reliable and the entire test is internally consistent [54]. A Cronbach's alpha coefficient of above 0.70 suggests that all of the items are reliable, and the entire test is internally consistent. This statistic was also used in this present study to calculate the reliability of PIMRS; the results are given in Table 1. However, all functions of leadership tested were found reliable and higher than values above 80, which are satisfactory [53]. Since the main objective was to develop an overall reliable PIMRS, internal reliability was calculated with 35 items of the instrument.

Furthermore, the reliability analysis of instructional leadership scale, as shown in Table 2, shows a relatively high level of overall Cronbach's alpha reliability ($\alpha=0.95$) and 0.74 for framing school goals subscale with 4 items, 0.73 for communicating the school goals subscale with 4 items, 0.68 for coordinating

the curriculum subscale with 3 items, 0.71 for supervising and evaluating instruction subscale with 3 items, 0.77 for monitoring student progress subscale with 3 items, 0.65 for protecting instruction time subscale with 3 items, 0.51 for maintaining high visibility subscale with 2 items, 0.66 for incentive for teachers subscale with 2 items, 0.85 for promoting professional development subscale with 5 items, and 0.752 for incentive for learners subscale with 3 items.

Cronbach's alpha statistical technique was used to assess the internal consistency of the 35-item questionnaire, as shown in Table 2. The analysis of the sub-scales, which was based on the sample size of 100 teachers, revealed a Cronbach's alpha value of 0.976 for the overall scale, indicating excellent internal consistency among the items. This suggests that all items on the questionnaire are reliable measures of the constructs.

Table 1. Reliability testing for the three main dimensions of PIMRS (N=100)

Instructional leadership construct	No of items	Cronbach alpha (α)
Defines school mission	8	0.83
Managing instructional program	9	0.87
Developing a positive SLC	18	0.91
Overall total	35	0.95

Table 2. Reliability analysis of instructional leadership scale (N=100 sample) item wise

Factors	No of items	Cronbach alpha (α)
Frame school goal	4	0.74
Communicates the school goal	4	0.73
Coordinate the curriculum	3	0.68
Supervise and evaluate instruction	3	0.71
Monitor student progress	3	0.77
Protect instruction time	3	0.65
Maintain high visibility	2	0.51
Incentive for teachers	2	0.66
Promote professional development	5	0.85
Incentive for learners	3	0.72
Total	32	0.95

As shown in Table 3, the construct validity for the dimension was evaluated through factor analysis. Assessing certain measures is necessary to determine the respondent data's fitness for factor analysis. The measures are the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy [60]–[62] and Bartlett's test of sphericity [63]. The value of KMO ranges from 0 to 1, with values of at least 0.05 to consider the factor analysis suitable [57]. The contracts of PIMRS dimensions produced KMO values ranging from 0.500 to 0.841, as revealed in Table 2. This shows that the respondent data (N=100) acquired for this present study is sufficient. Meanwhile, Bartlett's test of sphericity should be significant at $p < 0.05$ for factor analysis to be suitable [64]. All constructs demonstrate p-values for all variables below 0.001, indicating their significance and suitability for factor analysis. Additionally, when making significant decisions about an individual's fate based on test scores, alpha values should be at least 0.90, preferably 0.95 or better [65].

Table 4 demonstrates PCA through the varimax rotation method for factor extraction on the items. The PAC used eigenvalues to represent the proportion of variance accounted for by the factors. The eigenvalues greater than 1 showed 10 factors that represented 77% of the variance, which is considered good. Frame school goal explained 40.82%, communicates the school goal 6.77%, coordinates the curriculum 5.40%, supervises and evaluates instruction 5.18%, monitors student progress 4.49%, protects instruction time 3.60%, maintains high visibility 3.10%, provides incentives for teachers 2.88%, promotes professional development 2.70%, and incentives for learners 2.58% variance, as presented in Table 4.

Furthermore, a scree plot was carried out using factor analysis and data loading retention/extraction to enhance a better understanding of the present study. The scree plot presented eigenvalues (greater than 1) associated with a factor in descending order against the total number of factors. According to Pituch and Stevens [66], with a sample size of more than 200 participants, the scree plot will provide a fairly reliable measure for factor selection, while Kaiser [67] optionally retained all factors with eigenvalues greater than 1. Figure 1 shows the scree plot, in which the plot starts with the eigenvalue factors; however, in this study, 10 factors should be reserved, where the scree plot sustained a total 10-factor resolution obtained following the Kaiser-Guttman rule.

Table 3. Factor loadings (N=100)

Items	Components									
	1	2	3	4	5	6	7	8	9	10
Communicates the school mission effectively	0.811	0.376	0.387	0.511	0.374	0.396	0.495	0.314	0.384	0.473
Discusses academic goals with the teachers	0.738	0.255	0.359	0.413	0.283	0.517	0.328	0.328	0.444	0.474
Refers to the school's academic goals	0.797	0.430	0.361	0.404	0.377	0.332	0.475	0.567	0.431	0.511
Ensures school's academic goals are reflected	0.631	0.492	0.543	0.424	0.280	0.268	0.527	0.440	0.510	0.461
Conducts unscheduled observations regularly	0.396	0.753	0.381	0.462	0.364	0.462	0.384	0.535	0.565	0.473
Points out specific strength and/or weaknesses	0.453	0.747	0.412	0.413	0.470	0.486	0.474	0.534	0.468	0.568
Ensures teachers are consistent with the goals	0.356	0.847	0.551	0.507	0.361	0.451	0.583	0.403	0.535	0.475
Frames the school's goals in for staff	0.292	0.390	0.681	0.337	0.288	0.167	0.349	0.314	0.343	0.453
Uses needs assessment to source staff input	0.357	0.452	0.741	0.301	0.258	0.243	0.417	0.298	0.475	0.412
Uses data on students' performance	0.497	0.407	0.818	0.326	0.209	0.197	0.536	0.445	0.410	0.472
Makes the school goals easily understood	0.475	0.351	0.764	0.422	0.358	0.426	0.519	0.572	0.465	0.475
Recognizes students excel by giving rewards	0.518	0.451	0.371	0.849	0.512	0.481	0.155	0.573	0.328	0.431
Honors students during assembly	0.348	0.424	0.277	0.703	0.408	0.375	0.318	0.431	0.439	0.521
Communicates with parents to improved students	0.495	0.347	0.433	0.829	0.541	0.435	0.587	0.328	0.328	0.564
Reinforces superior performance by teachers	0.277	0.409	0.310	0.465	0.857	0.230	0.415	0.523	0.368	0.448
Rewards special efforts by teachers	0.482	0.455	0.331	0.475	0.870	0.413	0.449	0.588	0.356	0.498
Takes time to discuss with the students	0.492	0.357	0.328	0.510	0.285	0.748	0.479	0.598	0.461	0.506
Take time to attend extra – and co-curricular	0.293	0.325	0.238	0.348	0.406	0.623	0.266	0.406	0.281	0.330
Meets with teacher to discuss students' issues	0.510	0.465	0.435	0.412	0.469	0.344	0.775	0.344	0.535	0.409
Discusses academic performance results	0.538	0.489	0.487	0.525	0.313	0.371	0.888	0.469	0.566	0.536
Refers to tests measures student progress	0.475	0.261	0.475	0.363	0.477	0.500	0.820	0.273	0.475	0.368
Ensures students are not distracted during lesson	0.522	0.568	0.493	0.582	0.566	0.429	0.249	0.785	0.544	0.449
Encourages teachers to use instructional time	0.575	0.509	0.360	0.526	0.559	0.408	0.349	0.822	0.518	0.527
Support extra – and co-curricular activities	0.570	0.571	0.442	0.553	0.350	0.464	0.527	0.691	0.328	0.513
Ensures the in-service activities consistent	0.431	0.563	0.403	0.520	0.381	0.490	0.484	0.519	0.723	0.467
Supports the use of stills acquired during class	0.560	0.475	0.527	0.366	0.389	0.551	0.363	0.260	0.885	0.577
Ensures the participation of the whole staff	0.433	0.549	0.471	0.542	0.523	0.400	0.505	0.546	0.792	0.504
Supports teachers' in-service activities	0.476	0.596	0.516	0.565	0.433	0.523	0.362	0.359	0.831	0.476
Sets aside time to discuss about in-service programs	0.397	0.548	0.279	0.460	0.414	0.413	0.533	0.547	0.711	0.473
Decides who is responsible for coordinating curriculum	0.405	0.550	0.486	0.533	0.419	0.537	0.388	0.516	0.506	0.752
Draws results of school wide testing when making	0.374	0.513	0.498	0.455	0.493	0.405	0.418	0.473	0.345	0.779
Ensure school achieved the school's curriculum objectives	0.365	0.579	0.540	0.495	0.398	0.368	0.355	0.368	0.599	0.814

Table 4. The 10-dimension values, percentage of variance and Cronbach's coefficient alpha for each factor

Factors	Eigenvalue	% of variance	Cumulative %	Alpha
Factor 1	13.061	40.817	40.817	0.74
Factor 2	2.168	6.774	47.591	0.73
Factor 3	1.728	5.400	52.992	0.68
Factor 4	1.656	5.175	58.167	0.71
Factor 5	1.438	4.494	62.661	0.77
Factor 6	1.251	3.596	66.256	0.65
Factor 7	1.199	3.099	69.356	0.51
Factor 8	1.129	2.882	72.237	0.66
Factor 9	1.109	2.701	74.939	0.85
Factor 10	1.083	2.585	77.524	0.72

This study evaluated the content, face, and construct validity, as well as the reliability and internal consistency, of the PIMRS in the Nigerian educational context. While PIMRS has been widely utilized in several countries [46], it is rarely employed by Nigerian researchers. This study addresses this gap by assessing the instrument's applicability and measurement properties to ensure the quality of data and conclusions drawn F22 [52]. The findings reveal that the three primary dimensions of PIMRS—DSM, MIP, and shaping the SLC—achieved the minimum threshold of internal consistency reliability, with Cronbach's alpha coefficients exceeding 0.70. However, two sub-scales under the SLC dimension (monitoring halls and venues (MHV) and instructional feedback to teachers (IFT)) fell below the threshold, indicating areas requiring further refinement. Despite this, the overall reliability of the instrument was high, with a Cronbach alpha coefficient of 0.83, ranging between 0.87 and 0.91 for the three dimensions. These results validate the PIMRS as a robust tool for assessing instructional leadership practices in Nigeria.

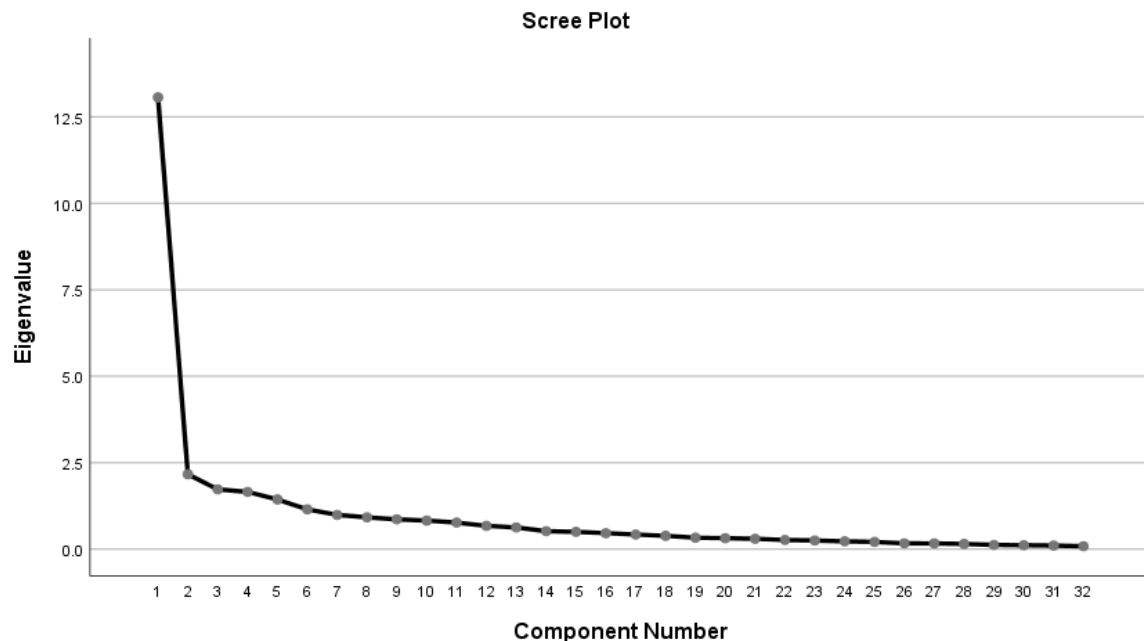


Figure 1. Scree plot factors extraction

All 35 items from the pilot phase were retained in the study due to their excellent reliability fit, thereby preparing the instrument for broader application in schools in Nigeria. This is particularly significant, as there is currently no standardized tool for evaluating instructional leadership practices among Nigerian principals in their local context. By adopting the PIMRS, Nigerian school principals can enhance their instructional knowledge and skills, thereby fostering school effectiveness, promoting reforms, and improving student learning outcomes F11 [12], [13], [68]. This research contributes to the existing gap in the instructional leadership literature by validating the PIMRS in the Nigerian context. The instrument's comprehensive dimensions provide principals with essential knowledge and guidance to strengthen their instructional leadership capabilities [6], [10]. Additionally, the PIMRS can serve as a valuable resource for educational researchers in Nigeria, where such tools are underutilized. By adopting the PIMRS, principals can improve their instructional practices, leading to better student achievement and progress toward educational goals. To ensure successful implementation, future research should focus on adapting the instrument to address the identified weaknesses in specific sub-scale. Moreover, capacity-building workshops and training programs should be organized for principals to familiarize them with the PIMRS and its application in enhancing instructional delivery [45]. By embedding the PIMRS into Nigeria's educational framework, stakeholders can significantly advance instructional leadership practices, and consequently, overall school effectiveness.

5. RECOMMENDATION

Based on the findings, the following recommendations vis-a-vis implications for practice are made. The sub-scales MHV and IFT under the SLC dimension should be further refined to enhance its reliability to make it a better tool for judging instructional leadership and giving accurate information on how to improve the delivery of instruction. The Nigerian Ministry of Education should organize capacity-building workshops for secondary school principals in collaboration with local education boards and professional development organizations to equip principals with the knowledge and skills to effectively implement the PIMRS in their schools, leading to improved teaching practices and better learning outcomes for students. Teacher training colleges and education management institutes should include the PIMRS as a core component of educational leadership training programs to create a culture of continuous improvement in instructional delivery, fostering a consistent focus on student achievement across the education system. Education policymakers at the federal and state levels are encouraged to adopt the PIMRS as a standardized tool for evaluating and monitoring instructional leadership practices in Nigerian schools to drive systemic improvements in instructional delivery and accountability across schools, thereby bridging regional and contextual disparities.

6. CONCLUSION

This study validates the PIMRS as a reliable and contextually relevant tool for evaluating instructional leadership practices in Nigerian secondary schools. The instrument demonstrates robust content and construct validity, with acceptable reliability across its three primary dimensions—DSM, MIP, and SLC. While specific sub-scales under the SLC dimension require refinement, the overall reliability of the tool supports its broader application. The adoption of the PIMRS offers Nigerian school principals a standardized approach to enhancing instructional leadership, fostering school reforms, and improving students' learning outcomes. Stakeholders can build a strong foundation for instructional leadership by integrating the PIMRS into Nigeria's educational framework. This will help achieve educational goals and make schools more effective overall.

Collaboration among key stakeholders such as principals, teachers, education administrators, parents, and policymakers are essential for the successful implementation of the PIMRS. Regular stakeholder meetings, community engagement sessions, and collaborative planning workshops can help build consensus on the tool's use and its role in improving instructional delivery. Encouraging teachers to provide feedback on instructional practices and involving parents in understanding school leadership practices can foster a supportive environment for implementing the PIMRS. Such collaboration might enhance buy-in and commitment from all stakeholders, ensuring the tool is effectively used to improve school performance and student outcomes.

FUNDING INFORMATION

Authors state no funding involved.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Hafsat Aliyu Bada	✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	
Habibat Abubakar Yusuf				✓		✓		✓	✓			✓	✓	
Jumoke Iyabode		✓	✓	✓		✓			✓		✓			
Oladele														
Peter Babajide Oloba		✓		✓		✓	✓			✓				

C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nvestigation

R : **R**esources

D : **D**ata Curation

O : Writing - **O**riginal Draft

E : Writing - Review & **E**editing

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

The authors obtained informed consent from all individuals included in this study.

DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author [JIO]. The data, which contains information that could compromise the privacy of research participants, are not publicly available to uphold ethical standards.

REFERENCES

- [1] R. P. Lakshmi, "Education as an instrument of social change," *Journal of Emerging Technologies and Innovative Research (JETIR)*, vol. 5, no. 10, pp. 317–320, 2018.
- [2] R. Lozano, M. Y. Merrill, K. Sammalisto, K. Ceulemans, and F. J. Lozano, "Connecting competences and pedagogical approaches for sustainable development in higher education: A literature review and framework proposal," *Sustainability*, vol. 9, no. 10, p. 1889, 2017, doi: 10.3390/su9101889.
- [3] K. Okoye, J. T. Nganji, J. Escamilla, J. M. Fung, and S. Hosseini, "Impact of global government investment on education and research development: A comparative analysis and demystifying the science, technology, innovation, and education conundrum," *Global Transitions*, vol. 4, pp. 11–27, 2022, doi: 10.1016/j.glt.2022.10.001.
- [4] O. S. Ogunwale, "Supervision in Education for Effective Teaching in Nigeria Secondary Schools," *NIU Journal of Humanities*, vol. 3, no. 4, pp. 115–122, 2018.
- [5] U. C. Okolie, H. E. Nwosu, B. C. Eneje, and B. N. Oluke, "Reclaiming education: Rising above examination malpractices, and its contextual factors on study progress in Nigeria," *International Journal of Educational Development*, vol. 65, pp. 44–56, 2019, doi: 10.1016/j.ijedudev.2019.01.001.
- [6] M. Ikram, S. Ghavifekr, and H. B. Kenayathulla, "Instructional leadership practices among school principals in Asian countries: a systematic review," *International Online Journal of Educational Leadership*, vol. 5, no. 1, pp. 4–24, 2021.
- [7] S. M. Raghab, A. M. Abd El Meguid, and H. A. Hegazi, "Treatment of leachate from municipal solid waste landfill," *HBRC Journal*, vol. 9, no. 2, pp. 187–192, 2013, doi: 10.1016/j.hbrj.2013.05.007.
- [8] L. Darling-Hammond, M. E. Wechsler, S. Levin, M. Leung-Gagne, and S. Tozer, *Developing effective principals: What kind of learning matters?* Palo Alto, CA: Learning Policy Institute, 2022, doi: 10.54300/641.201.
- [9] P. Hallinger and J. Murphy, "Assessing the Instructional Management Behavior of Principals," *The Elementary School Journal*, vol. 86, no. 2, pp. 217–247, 1985, doi: 10.1086/461445.
- [10] C. Othman and A. H. Busari, "The Evolution of Instructional Leadership: A 10-Year Bibliometric Perspective," *International Journal of Modern Education*, vol. 6, no. 22, pp. 519–534, 2024, doi: 10.35631/ijmoe.622035.
- [11] C. Day, Q. Gu, and P. Sammons, "The Impact of Leadership on Student Outcomes," *Educational Administration Quarterly*, vol. 52, no. 2, pp. 221–258, 2016, doi: 10.1177/0013161x15616863.
- [12] K. Leithwood and J. Sun, "Academic culture: a promising mediator of school leaders' influence on student learning," *Journal of Educational Administration*, vol. 56, no. 3, pp. 350–363, 2018, doi: 10.1108/JEA-01-2017-0009.
- [13] P. Hallinger and W.-C. Wang, *Assessing Instructional Leadership with the Principal Instructional Management Rating Scale*. Cham: Springer International Publishing, 2015, doi: 10.1007/978-3-319-15533-3.
- [14] F. Bashir and A. Afzal, "Effects of Pedagogical Leadership on The Student Achievements at Secondary Level," *UMT Education Review*, vol. 2, no. 2, pp. 90–118, 2019, doi: 10.32350/uer.22.05.
- [15] N. Allen, B. Grigsby, and M. L. Peters, "Does leadership matter? Examining the Relationship Among Transformational Leadership, School Climate, and Student Achievement," *NCEA International Journal of Educational Leadership Preparation*, vol. 10, no. 2, pp. 1–22, 2015.
- [16] Y. Hou, Y. Cui, and D. Zhang, "Impact of instructional leadership on high school student academic achievement in China," *Asia Pacific Education Review*, vol. 20, no. 4, pp. 543–558, 2019, doi: 10.1007/s12564-019-09574-4.
- [17] P. Naidoo and R. Mestry, "Instructional Leadership Development for Principals: A South African Context," in *Instructional Leadership and Leadership for Learning in Schools Understanding Theories of Leading*, T. Townsend, Ed., Cham: Springer International Publishing, 2019, pp. 237–265, doi: 10.1007/978-3-030-23736-3_10.
- [18] H. Shaked, J. Glanz, and Z. Gross, "Gender differences in instructional leadership: how male and female principals perform their instructional leadership role," *School Leadership and Management*, vol. 38, no. 4, pp. 417–434, 2018, doi: 10.1080/13632434.2018.1427569.
- [19] S. Ganon-Shilon and C. Schechter, "School principals' sense-making of their leadership role during reform implementation," *International Journal of Leadership in Education*, vol. 22, no. 3, pp. 279–300, 2019, doi: 10.1080/13603124.2018.1450996.
- [20] J. Patti, A. A. Holzer, R. Stern, and M. A. Brackett, "Personal, Professional Coaching: Transforming Professional Development for Teacher and Administrative Leaders," *Journal of Leadership Education*, vol. 11, no. 1, pp. 263–274, 2012, doi: 10.12806/V11/I1/AB4.
- [21] R. M. Mitchell, L. A. W. Kensler, and M. Tschannen-Moran, "Examining the effects of instructional leadership on school academic press and student achievement," *Journal of School Leadership*, vol. 25, no. 2, pp. 223–251, 2015, doi: 10.1177/105268461502500202.
- [22] G. Wei, J. Lu, and H. Qian, "Principal Instructional Leadership: Chinese PIMRS Development and Validation," *Chinese Education and Society*, vol. 51, no. 5, pp. 337–358, 2018, doi: 10.1080/10611932.2018.1510688.
- [23] G. Fromm, P. Hallinger, P. Volante, and W. C. Wang, "Validating a Spanish Version of the PIMRS," *Educational Management Administration & Leadership*, vol. 45, no. 3, pp. 419–444, 2017, doi: 10.1177/1741143215617948.
- [24] A. S. Munna, "Instructional Leadership and Role of Module Leaders," *International Journal of Educational Reform*, vol. 32, no. 1, pp. 38–54, 2023, doi: 10.1177/10567879211042321.
- [25] F. M. M. Sultan, G. Karuppannan, and J. Rumpod, "Instructional Leadership Practices Among Headmasters and The Correlation with Primary Schools' Achievement in Sabah, Malaysia," *English Language Teaching*, vol. 15, no. 2, pp. 50–60, 2022, doi: 10.5539/elt.v15n2p50.
- [26] M. D. Ralebese, L. Jita, and O. T. Badmus, "Examining primary school principals' instructional leadership practices: a case study on curriculum reform and implementation," *Education Sciences*, vol. 15, no. 1, p. 70, 2025, doi: 10.3390/educsci15010070.
- [27] A. Harris and M. Jones, "The importance of school leadership? What we know," *School Leadership and Management*, vol. 43, no. 5, pp. 449–453, 2023, doi: 10.1080/13632434.2023.2287806.
- [28] H. A. Bada, T. F. T. Ariffin, and H. Nordin, "Teachers' perception of principals' instructional leadership practices in Nigeria," *Universal Journal of Educational Research*, vol. 8, no. 10, pp. 4459–4469, 2020, doi: 10.13189/ujer.2020.081013.
- [29] G. Tshabalala and Y. A. Faremi, "Leadership role of the school principal in developing and improving learner performance in Eswatini Schools," *European Journal of Education and Pedagogy*, vol. 5, no. 6, pp. 7–13, 2024, doi: 10.24018/ejedu.2024.5.6.875.
- [30] V. Govindasamy and R. Mestry, "The principal's role in managing curriculum change: Implications for the provision of quality education," *South African Journal of Education*, vol. 42, no. 4, pp. 1–10, 2022, doi: 10.15700/saje.v42n4a2294.
- [31] P. Antoniou and M. Lu, "Evaluating the measuring properties of the principal instructional management rating scale in the Chinese educational system: Implications for measuring school leadership," *Educational Management Administration and Leadership*, vol. 46, no. 4, pp. 624–641, 2018, doi: 10.1177/1741143217700282.
- [32] K. Leithwood, "A review of evidence about equitable school leadership," *Education Sciences*, vol. 11, no. 8, p. 377, 2021, doi: 10.3390/educsci11080377.

- [33] D. K. Gurley, G. B. Peters, L. Collins, and M. Fifolt, "Mission, vision, values, and goals: An exploration of key organizational statements and daily practice in schools," *Journal of Educational Change*, vol. 16, no. 2, pp. 217–242, May 2015, doi: 10.1007/s10833-014-9229-x.
- [34] D. R. S. M. Fuad, K. Musa, and Z. Hashim, "Innovation culture in education: A systematic review of the literature," *Management in Education*, vol. 36, no. 3, pp. 135–149, 2022, doi: 10.1177/0892020620959760.
- [35] S. Meng, "Enhancing Teaching and Learning: Aligning Instructional Practices with Education Quality Standards," *Research and Advances in Education*, vol. 2, no. 7, pp. 17–31, 2023, doi: 10.56397/rae.2023.07.04.
- [36] T. Agasisti, A. J. Bowers, and M. Soncin, "School principals' leadership types and student achievement in the Italian context: Empirical results from a three-step latent class analysis," *Educational Management Administration and Leadership*, vol. 47, no. 6, pp. 860–886, 2019, doi: 10.1177/1741143218768577.
- [37] Sulastri, Syahril, and N. Adi, "Optimizing the Vision and Mission of Schools in Learning Leadership Based on Action Learning Schools," in *Proceedings of the 2nd Progress in Social Science, Humanities and Education Research Symposium (PSSHRS 2020)*, vol. 563, pp. 363–368, 2021, doi: 10.2991/assehr.k.210618.068.
- [38] B. C. Fusarelli and L. D. Fusarelli, "Leadership for the Future: Enhancing Principal Preparation Through Standards and Innovation," *Education Sciences*, vol. 14, no. 12, p. 1403, 2024, doi: 10.3390/educsci14121403.
- [39] A. Harris, M. Jones, and T. Crick, "Curriculum leadership: a critical contributor to school and system improvement," *School Leadership and Management*, vol. 40, no. 1, pp. 1–4, 2020, doi: 10.1080/13632434.2020.1704470.
- [40] M. Uljens, "The Why, Where, How and What of Curriculum Leadership: A Non-affirmative Approach," *Educational Governance Research*, vol. 23, pp. 179–197, 2024, doi: 10.1007/978-3-031-37604-7_9.
- [41] S. Sahlin, "Teachers Making Sense of Principals' Leadership in Collaboration Within and Beyond School," *Scandinavian Journal of Educational Research*, vol. 67, no. 5, pp. 754–774, 2023, doi: 10.1080/00313831.2022.2043429.
- [42] M. Q. M. Al Sharafat, L. M. O. AlMasaeid, and R. M. S. Al-Zoubi, "Teachers' Perspectives on Public School Principals' Instructional Leadership Practices: An Assessment Using the Hallinger Scale," *Journal of Educational and Social Research*, vol. 14, no. 3, pp. 324–342, 2024, doi: 10.36941/jesr-2024-0076.
- [43] M. Akram, S. Kiran, and A. Ilgan, "Development and validation of instructional leadership questionnaire," *International Journal of Organizational Leadership*, vol. 6, no. 1, pp. 73–88, 2017, doi: 10.33844/ijol.2017.60435.
- [44] O. Flora and E. Egwunyenga, "Assessing principals' leadership and information technology skills on effective administration in public secondary schools in Delta State," *European Journal of Humanities and Educational Advancements*, vol. 4, no. 12, pp. 93–98, 2023.
- [45] M. S. Maclin, P. E. M. Nalova, and D. A. Lyonga (AP), "Classroom visitations by instructional supervisors and teachers' effectiveness in the implementation of the competency based approach in secondary schools in the South West Region of Cameroon," *The American Journal of Social Science and Education Innovations*, vol. 6, no. 8, pp. 57–71, 2024, doi: 10.37547/tajssei/volume06issue08-05.
- [46] E. Lai and D. Cheung, "Enacting teacher leadership," *Educational Management Administration & Leadership*, vol. 43, no. 5, pp. 673–692, 2015, doi: 10.1177/1741143214535742.
- [47] O. E. Toki, S. N. Padonu, and T. A. Olaseni, "The Impact of Performance Appraisal and Appropriate Reward on Employees' Performance," *Global Journal of Research in Business Management*, vol. 3, no. 5, pp. 1–10, 2023.
- [48] A. Hidayat, A. W. Syakhrani, and Samdani, "The Dynamics of Human Resource Management in Education," *Indonesian Journal of Education (INJOE)*, vol. 4, no. 2, pp. 519–529, 2024.
- [49] F. Saddiqua, "Enhancing morale through effective communication: a study of head teacher-teacher interaction in government schools of Rawalpindi City," *Pakistan Languages and Humanities Review*, vol. 6, no. 1, pp. 229–240, 2022, doi: 10.47205/plhr.2022(6-i)20.
- [50] J. M. Alves, M. Tintoré, and L. J. P. Serra, "Editorial: Leadership, learning, well-being, and justice in educational organizations," *Frontiers in Education*, vol. 10, p. 1577472, 2025, doi: 10.3389/feduc.2025.1577472.
- [51] P. Hallinger, "Principal Instructional Leadership," in *The Wiley Handbook of Teaching and Learning*, G. E. Hall, L. F. Quinn, and D. M. Gollnick, Eds., Hoboken, NJ: Wiley-Blackwell, 2018, pp. 505–528, doi: 10.1002/9781118955901.ch21.
- [52] P. Hallinger and M. Lee, "Mapping instructional leadership in Thailand," *Educational Management Administration & Leadership*, vol. 42, no. 1, pp. 6–29, 2014, doi: 10.1177/1741143213502196.
- [53] A. T. Evers, K. Kreijns, and B. I. J. M. van der Heijden, "The design and validation of an instrument to measure teachers' professional development at work," *Studies in Continuing Education*, vol. 38, no. 2, pp. 162–178, 2016, doi: 10.1080/0158037X.2015.1055465.
- [54] W. W. Y. Ho, "Principal component analysis: development and initial validation of the mirror effects inventory," *BMC Psychology*, vol. 11, no. 1, p. 363, 2023, doi: 10.1186/s40359-023-01397-8.
- [55] D. Cooper and P. Schindler, *Business research methods*. New York: McGraw Hill, 2014.
- [56] M. Saunders, P. Lewis, and A. Thornhill, *Research methods for business students*. Harlow: Pearson, 2016.
- [57] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, *Multivariate Data Analysis*. 7th ed, New York: Pearson, 2010.
- [58] J. R. Fraenkel, N. E. Wallen, and H. H. Hyun, *How to design and evaluate research in education*. 8th ed. New York: Mc Graw Hill, 2012.
- [59] M. S. Daud, S. Osman, A. H. Hashim, and H. Abd Rahim, "Internal Consistency Reliability and Construct Validity of the Safety Questionnaire for Ride-Hailing Car," *International Journal of Academic Research in Business and Social Sciences*, vol. 13, no. 4, pp. 755–768, 2023, doi: 10.6007/ijarbss/v13-i4/16636.
- [60] H. Y. Lee, Y. L. Chen, and L. J. Weng, "Brief research report: effects of sampling error and categorization on estimation of measure of sampling adequacy," *Journal of Experimental Education*, vol. 92, no. 2, pp. 398–410, 2024, doi: 10.1080/00220973.2023.2196672.
- [61] J. I. Oladele, "Path modeling of factors that predict self-regulated learning," *International Journal of New Education*, no. 13, pp. 27–56, 2024, doi: 10.24310/ijne.13.2024.19607.
- [62] S. Noora, "Factor analysis as a tool for survey analysis," *American Journal of Applied Mathematics and Statistics*, vol. 9, no. 1, pp. 4–11, 2021.
- [63] M. Bartlett, "Tests of significance in factor analysis," *British Journal of Psychology*, vol. 3, pp. 77–85, 1950.
- [64] B. G. Tabachnick and L. S. Fidell, *Using multivariate statistics*. Harlow: Pearson Education, 2014.
- [65] R. V. Kumar, "Cronbach's Alpha: Genesis, Issues and Alternatives," *IMIB Journal of Innovation and Management*, vol. 2, no. 2, pp. 226–242, Apr. 2024, doi: 10.1177/ijim.241234970.
- [66] K. A. Pituch and J. P. Stevens, *Applied Multivariate Statistics for the Social Sciences*. New York: Routledge, 2015, doi: 10.4324/9781315814919.
- [67] H. F. Kaiser, "The Application of Electronic Computers to Factor Analysis," *Educational and Psychological Measurement*, vol. 20, no. 1, pp. 141–151, 1960.
- [68] J. G. Rigby, "Principals' sensemaking and enactment of teacher evaluation," *Journal of Educational Administration*, vol. 53, no. 3, pp. 374–392, 2015, doi: 10.1108/JEA-04-2014-0051.

BIOGRAPHIES OF AUTHORS



Hafsat Aliyu Bada    is a chief education officer and teacher educator in Senior Secondary School as well as vice principal academic with 15 years experience at the Kwara State Teaching Service Commission, Ilorin, Nigeria. She is a Ph.D. holder in educational management from the School of Education and Modern Languages, College of Art and Sciences, Universiti Utara Malaysia (UUM) in 2023. She obtained her M.Ed. and B.Ed. in educational management from the Faculty of Education, University of Ilorin, Ilorin, Nigeria. Her research interests include educational leadership, teachers' effectiveness and professional development in Africa. She can be contacted at email: hafsatbada@gmail.com.



Habibat Abubakar Yusuf    obtained a bachelor and master's degree in educational management from the University of Ilorin in 2009 and 2013, respectively. She equally received her Ph.D. degree in education from the Universiti Utara Malaysia. She has over 13 years of working experience as education quality assurance officer and lecturer. She is currently a senior lecturer in the Department of Educational Management, Faculty of Education, University of Ilorin. Her current research interest focuses on basic and secondary education in Nigeria and Malaysia with special interests in school administration and leadership, teacher development and quality assurance, classroom communication for quality instructional delivery, and curriculum implementation and management. She can be contacted at email: yusuf.ha@unilorin.edu.ng.



Jumoke Iyabode Oladele    holds a bachelor's of science education degree in geography the University of Ilorin, Nigeria and she graduated with a second-class upper degree. She also completed her masters and Ph.D. in educational research, measurement and evaluation from the same university. These academic qualifications inform her specialization as a teacher, researcher, and psychometrician. She holds a teaching position with the University of Ilorin and had her postdoctoral fellowship with the University of Johannesburg, South Africa, where she bagged a Research Excellence Award and engage in postgraduate teaching and higher degree co-supervision. Her research interests are in scholarship for teaching and learning, quantitative and qualitative research and analysis, item response theory-based psychometrics in educational assessments using adaptive testing technologies for improving standardized assessment in Africa, educational evaluation, and gender/innovation studies. She can be contacted at email: jumokeo@uj.ac.za.



Peter Babajide Oloba    holds a Ph.D. in education from the University of Johannesburg, South Africa. He is a lecturer and campus coordinator in the Department of Languages, Cultural Studies, and Applied Linguistics at the University of Johannesburg. With extensive experience in higher education, he has lectured undergraduate and postgraduate students across multiple disciplines, including communication skills, business literacy, teaching studies, research methodology and design, school guidance and support, learning theories, inclusive pedagogy, and education management. His research interests include educational leadership, teacher well-being, digital pedagogy, curriculum development, and applied linguistics. Dr. Oloba has published in accredited journals and presented at international conferences, contributing to scholarly discourse on inclusive education, leadership in disadvantaged schools, inmate rehabilitation, sustainability, systemic change, and the integration of fourth industrial revolution technologies in education and the postal sector. He can be contacted at email: petero@uj.ac.za.