Cogent Education

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/oaed20

School-Based Supervisory Practices and Teachers' Job Effectiveness Using Bootstrapping in Covariance-Based Structural Equation Modelling

Valentine J. Owan, Abraham J. Johnson, Rosemary O. Osim, German E. Anagbogu, Bernard D. Otu, Stephen B. Undie, Joseph O. Ogabor, Martina A Apie & Scholastica C. O. Ekere

To cite this article: Valentine J. Owan, Abraham J. Johnson, Rosemary O. Osim, German E. Anagbogu, Bernard D. Otu, Stephen B. Undie, Joseph O. Ogabor, Martina A Apie & Scholastica C. O. Ekere (2023) School-Based Supervisory Practices and Teachers' Job Effectiveness Using Bootstrapping in Covariance-Based Structural Equation Modelling, Cogent Education, 10:1, 2168406, DOI: 10.1080/2331186X.2023.2168406

To link to this article: https://doi.org/10.1080/2331186X.2023.2168406

Published online: 03 Feb 2023.

Owan et al., *Cogent Education* (2023), 10: 2168406
https://doi.org/10.1080/2331186X.2023.2168406

cogent education

EDUCATIONAL LEADERSHIP & MANAGEMENT | RESEARCH ARTICLE

School-Based Supervisory Practices and Teachers' Job Effectiveness Using Bootstrapping in Covariance-Based Structural Equation Modelling

Valentine J. Owan[1*], Abraham J. Johnson[2], Rosemary O. Osim[2], German E. Anagbogu[3], Bernard D. Otu[3], Stephen B. Undie[3,4], Joseph O. Ogabor[4], Martina A Apie[4] and Scholastica C. O. Ekere[4]

Received: 11 December 2022
Accepted: 10 January 2023

*Corresponding author: Valentine J. Owan, Ultimate Research Network (URN), Calabar, Nigeria
E-mail: owanvalentine@gmail.com

Reviewing editor:
Nicholas Sun-Keung Pang, Department of Vocational Education, University of Calabar, Calabar, Nigeria

Additional information is available at the end of the article

Abstract: Due to the importance of teachers in providing quality education, research in the last two decades has consistently focused on their effectiveness. However, there are inconclusive debates in the literature on the nature of relationships that exist between different supervisory strategies and their links to teachers' job performance. This study used a predictive correlation design to assess how five principals' supervisory practices contribute to teachers' job effectiveness generally and across three specific areas. Secondary school teachers that participated in the study were 284 and were selected using simple and purposive sampling techniques. Data were collected using a questionnaire. A bootstrapping procedure in covariance-based structural equation modelling (CB-SEM) and multiple linear regression analysis were used for hypotheses testing at the .05 alpha level. Among others, findings revealed a significant joint prediction of classroom observation, supervision of sporting activities, instructional aids, team teaching and school record on teachers' job effectiveness generally and in the dimensions of lesson note preparation and classroom management, but not the use of instructional materials. Teachers

Valentine J. Owan

ABOUT THE AUTHOR

Valentine J. Owan is a postgraduate student of Research, Measurement and Evaluation in the Department of Educational Foundations at the University of Calabar, Nigeria. He is the founder of the Ultimate Research Network (URN), a multidisciplinary research initiative aimed at raising the next generation of scholars for knowledge creation and problem-solving through self-development. His research interests include item-response theory, research and statistics, structural equation modelling, program evaluation, quantitative research methodology, Rasch measurement theory, and higher education. Due to his early interest in research, Owan has published internationally and domestically in many journals. He is an established reviewer for several WoS- and Scopus-indexed academic journals.

PUBLIC INTEREST STATEMENT

This study examines the impact of secondary school principals' supervisory activities on teachers' effectiveness in lesson preparation, classroom management, and use of instructional materials. Findings suggest that principals who engage in supervisory practices such as observing classrooms, overseeing sports activities, managing instructional aids and team teaching, and maintaining statutory records tend to be more effective than those fulfilling one at a time in promoting effective teachers. However, teachers' use of instructional materials is less impacted by this type of school-based supervision at both the individual and overall levels. This research can be a valuable resource for school principals to gain the knowledge and strategies to effectively and efficiently supervise their schools. The study can also inspire teachers to embrace the value of school-based supervision in improving their instructional practices and staying current with global education trends through professional development opportunities.

who reported frequent classroom observation by principals also reported a higher level of lesson preparation but not other aspects of teaching effectiveness. The supervision of sporting activities significantly predicted teachers' overall effectiveness and specific aspects such as lesson preparation, instructional material use, and classroom management. This study can encourage school principals to gain more knowledge, facts and strategies required for effective and efficient school-based supervision.

Subjects: Education Studies; School Leadership, Management & Administration; Secondary Education

Keywords: Classroom observation; instructional aids; school records; sports activities; supervision; team teaching

1. Introduction

Due to the importance of teachers in providing quality education, research in the last two decades has consistently focused on their effectiveness (Aduma et al., 2022; Akah et al., 2022; Arop et al., 2020, 2018a; Lai & Peng, 2019; Soto-Pérez et al., 2020). Teachers' job effectiveness refers to the degree to which school instructors demonstrate the ability to carry out core responsibilities of modifying students' affective, cognitive and psychomotor attributes (Al-Kiyumi & Hammad, 2019; Bassey et al., 2019). Therefore, an effective teacher is associable, communicable and accessible, teaches frequently, maintains standard records, is fluent and encourages self-actualisation among students (Arop et al., 2019; Owan & Agunwa, 2019).

However, previous studies have reported that many teachers exhibit poor attitudes towards time management, punctuality, note writing, instructional delivery and students evaluation, among others, in the context of the Philippines (Calisang & Futalan, 2020) and Nigeria (Oluchi, 2013; Owan, 2021; Owan, Odigwe, et al., 2022; Owenvbiugie & Ibadin, 2017). Some secondary school teachers, especially those in rural schools in Nigeria, have been reported to be lukewarm, lackadaisical, and engaging in sexual relationships with students whilst neglecting assigned duties (Arop et al., 2018a; Edet et al., 2017; Omori & Bassey, 2019; Owan, 2018, 2019). These observations corroborate the reports of other scholars that teachers' attitudes towards service delivery are abysmal in Finland and South Africa (Laine et al., 2019; Savolainen et al., 2012).

In the context of the northeast education zone of Akwa Ibom State in Nigeria, researchers have reported that most secondary school teachers are unconcerned about performing assigned duties, especially when these clash with their interests. For example, most teachers have been found to stay away from school whilst giving attention to their private projects/businesses during school periods (Arop et al., 2018b; Etiubon & Akpan, 2017; Oleforo et al., 2015). Most of these highly engaged teachers in other ventures often send notes for class captains to copy for their colleagues whilst they are away.

From the preceding, it is evident that the problem of teachers' poor service discharge is pervasive, with resultant consequences. The ineffectiveness of teachers could lead to slow or insufficient academic achievement if not timely addressed. The failure of teachers to carry out their duties effectively could be attributed to the principals' administrative lapses in supervising teachers' instructional practices. Why would teachers behave as reported in the literature if they are adequately supervised and cautioned by their superiors? Along these lines, we conducted the current study to investigate the predictive relationship of school-based supervisory practices to teachers' job effectiveness.

School-based supervisory practices are activities by school leaders to observe all the activities (both curricular and co-curricular) ongoing in a school to promote adherence to school norms and

expectations. It creates a platform for principals to collectively appraise teachers' knowledge and skills for gaps identification and remediation. School-based supervisory practices include classroom observation, supervision of sporting activities, supervision of instructional aids, supervision of team teaching and supervision of statutory records (Al-Kiyumi & Hammad, 2019; Barahona, 2019; Burns et al., 2016; Marey et al., 2020; Owan, Asuquo, et al., 2022).

Studies on classroom observation have shown that most secondary school principals effectively supervise teachers (Egwu, 2015). On the contrary, opposing studies have also reported that principals were ineffective in their classroom visitations (Grissom et al., 2018; Liu & Hallinger, 2018). Classroom observation practices by school leaders include observation of teaching methods, inspecting records of work covered by teachers, checking and correcting lesson plans and holding sessions with teachers for guidance (Lyonga, 2018). Other studies have found that principals' classroom visitation practices significantly influenced or correlated with teachers' job performance (Aduma et al., 2022; Edo & David, 2019; Nnebedum & Akinfolarin, 2017) and students' academic achievement (Ekpoh & Eze, 2015; Elenwo, 2018). It has also been documented that teachers in schools with adequate instructional supervision were more effective than those with inadequate supervision (Iroegbu & Etudor-Eyo, 2016). Nevertheless, the cited studies did not provide information on how much classroom observation explains the variance in teachers' job performance (since they mostly used an associative correlational design). One weakness of associative correlation studies is that established relationships do not imply causation (Owan, Odigwe, et al., 2022; Rohrer, 2018; Rosato et al., 2018). Consequently, most studies recommended that future studies employ robust statistical methods such as structural equation modelling to examine the predictive relationship between the variables, giving rise to the current study.

Regarding sporting activities, available evidence suggests that school leadership practices play a crucial role in the commitment and involvement of students in extracurricular activities (Anani et al., 2016). However, previous studies have focused more on students' extracurricular engagements. For instance, it has been found that students' extracurricular engagements play a role in academic achievement (Donnelly et al., 2013; Singh & Mishra, 2015). Another piece of evidence emerged that students who engaged in sporting activities were more likely to develop better affective, cognitive and psychomotor skills (Castro-Sánchez et al., 2019; Turkmen, 2013). However, very rarely has any previous study considered the role of principals in the supervision of co-curricular activities, except for a study which indicated that the supervision of extracurricular activities positively impacted educational professionals (Moran, 2017). This shows that the literature on the supervision of sporting activities is very scanty. Understanding how teachers monitor school sporting activities is crucial since it is a core co-curricular activity. It can be argued that the degree to which principals supervise sport-related activities in school might decide how well staff and students respond to it.

Studies on instructional resources have found that maintenance significantly impacted teachers' job performance (Fatimayin & Jacob, 2022) and school effectiveness (Mbon et al., 2020). However, most literature has proven its effectiveness in promoting students' academic performance. For instance, it has been shown that students taught using instructional aids outperformed those in conventional classrooms without teaching aids (Chang & Hwang, 2018; Haghighi et al., 2019; Hofer et al., 2018; Olayinka, 2016). However, these studies only focused on how teachers utilise teaching aids but did not assess how principals' supervision of available teaching aids can affect teachers' job performance. This created a gap that motivated the current study. It is unarguable that the supervision or overall maintenance of teaching aids can promote teachers' access to and utilisation of instructional resources.

Team teaching is a pedagogic process in which more than one teacher is involved in instruction within a classroom. Some scholars have revealed that team teaching made teachers grade students and assume responsibility, maintain self-discipline, develop a common language, communicate their expectations, focus on students' improvement, and provide feedback to one

another (Anani et al., 2016). Other studies indicated that team teaching was responsible for the enhanced performance of students (Dambo et al., 2019; Ezenwosu et al., 2015; Kostko, 2019) and teachers' improvement (Al-Kiyumi & Hammad, 2019; Lee, 2022). Another research indicated that instructors who formed their teaching teams reported higher satisfaction with their shared responsibilities and their pleasure in the co-teaching process (Krammer et al., 2018). These findings corroborate the hypothesis that team members' ability to choose one another aids in forming cohesive classroom units but does not guarantee improved student learning via team instruction. The literature on team teaching is very scarce about teachers' job effectiveness. From our review, this is the first research evaluating the predictive link of principals' supervision of team teaching to teachers' job effectiveness across three specific areas, using a second-generation statistical approach.

Previous research on school records management has identified admission registers, attendance registers, education edict and regulation manuals, logbooks, punishment books, school accounts books, school timetables, staff minutes books, staff record registers, visitors books, and weekly diaries of work, as statutory records kept by secondary school principals (Owo, 2014). Nevertheless, scholars have found various problems associated with record-keeping in Nigerian schools (Omoha, 2013). These include poor record management practices among school leaders (Khali, 2014; Odigwe & Owan, 2019), unavailability of records retention mechanisms and lack of qualified staff to manage records (Khali, 2014). Other studies have established that the management of statutory records about staff, finances and students is significantly associated with principals' administrative (Ereh & Okon, 2015; Ojo & Obimuyiwa, 2019) and teachers' (Okorie & Nwiyi, 2014) effectiveness. Although the results of previous studies provided a framework for the current study by assessing the prediction of records management on teachers' performance (Odigwe et al., 2020), all of them were very generic. The supervision of school records and records management are different because the former is more specific than the latter. Whilst the results of previous studies are appreciated, there is a further need to examine the degree to which specific management practice affects teachers' job performance. For this reason, the current study:

(1) estimated the joint prediction of school-based supervisory practices (SSPs) such as classroom observation (CO), supervision of sporting activities (SSA), supervision of instructional aids (SIA), supervision of team teaching (STT) and supervision of school records (SSR) on teachers' job effectiveness generally (TJEG) and in specific areas such as lesson note preparation (LNP), use of instructional materials (UIM) and classroom management (CM), respectively;

(2) determined the predictive relationship of individual SSPs such as CO, SSA, SIA, STT and SSR to TJEG and in specific areas such as LNP, UIM and CM, respectively.

2. Methods

2.1. Research design

The quantitative correlational research method (Cresewell, 2011; Sherri, 2011) was followed in this study, focusing on the predictive correlational design. "In predictive design, the investigator has to categorically indicate that the goal of the investigation is to determine the prediction capability of a given variable" (Pandita, 2012, p.1). This design fits the current study because the predictor is school-based supervision practices, whereas the criterion variable is teachers' job effectiveness. Furthermore, this study will analyse the prediction of many variables (the five aspects of school-based supervision) on three dimensions of the criterion variable. Correlational designs allow for the analysis of multiple variables (Rashid, 2012). In terms of the data collection method, the cross-sectional approach was adopted in this study. The cross-sectional approach allows researchers to collect information from targeted respondents at a one-time point (Owan et al., 2021; Setia, 2016) instead of longitudinal studies that collect data over time. This design enabled the researchers to administer questionnaire copies once to respondents.

2.2. Participants

The population of this study comprised 3,239 public secondary school teachers in the 89 public secondary schools in the North-East Education Zone of Akwa Ibom State, Nigeria. Out of these, 1133 were males, while 2106 were females. The multistage sampling procedure was followed in this study to recruit 295 teachers from the entire study population.

2.3. Instrument and measures

"School-Based Supervision and Secondary School Teachers Job Effectiveness Questionnaire (SBSSSTJEQ)", designed by the researchers, was used for data collection. We developed the instrument due to the lack of an existing instrument on this study's variables in the context of Akwa Ibom State. The items in the questionnaire were constructed using ideas from literature related to the variables. The instrument was organised into two (2) sections. Section A was designed to measure five predictors (school-based supervision variables) such as classroom observation, supervision of sporting activities, instructional aids, team teaching and statutory records. Classroom observation is a supervisory practice that involves regular classroom visits by school administrators during teaching to improve teachers' classroom instructions. It was measured by the sum of the scores on items 1–6 in section A of SBSSSTJEQ. Supervision of sporting activities involves the ability of principals to effectively monitor, guide and support teachers as they participate in sports activities. It was measured by summing the scores of items 7–12 in section A of SBSSSTJEQ.

Supervision of instructional aids refers to how school administrators examine teaching aids before teachers present them to students. It was measured by the sum of the scores on items 13–18 in section A of SBSSSTJEQ. Supervision of team teaching is one of the team approaches to school supervision where school administrators oversee the activities of teachers engaged in a collaborative instructional process. Teachers are made to work together as a team to improve their professional competence in the school environment through adequate supervision by the school principal. It was measured by summing the scores of items 19–24 in section A of SBSSSTJEQ. Supervision of statutory records refers to principals' efforts to create files, folders, and storage, retrieval, retention and disposition of all information relating to students and staff, as well as the schools personal and official records. It was measured by the sum of the scores of items 25–30 in section A of SBSSSTJEQ.

Section B of the questionnaire measured the criterion variable (teachers job effectiveness) across three dimensions: lesson note preparation, use of instructional materials, and classroom management. Teachers' job effectiveness generally refers to how well teachers can perform assigned duties. The variable was quantified generally by taking the average scores of the three specific dimensions discussed hereafter. Lesson note preparation is a practice where teachers decide what will be taught and how to implement it to promote understanding among learners. It was measured by summing scores of items 1–6 in section B of SBSSSTJEQ. The use of instructional materials is the degree of teachers' deployment of diverse resources that could be applied to make lesson contents understandable for learners. It also includes teachers' improvisation frequency in cases where standard materials are unavailable. It was measured by summing the scores of items 7–12 in section B of SBSSSTJEQ. Classroom management is teachers' ability to control students' and other relevant materials during instructional delivery for a quality learning atmosphere. It was measured by summing the scores of items 13–18 in section B of SBSSSTJEQ.

Overall, the SBSSSTJEQ contained 50 items (32 in section A and 18 in B) on a modified 4-point Likert-type scale. The items on SBSSSTJEQ were on 4-point response options ranging from Strongly Agree (SA), Agree (A), Disagree (DA) and Strongly Disagree (SD). Six items were used to measure each variable (both for school-based supervisory practices and teachers' job effectiveness). Table 1 provides a complete classification of the variables of this study and their roles.

Table 1. Variables and their classification

SN	Variables	Acronym	Type	Scoring	Role
1	Classroom observation	CO	Continuous	Sum of responses to items 1–6 in section A of SBSSSTJEQ	Predictor
2	Supervision of sporting activities	SSA	Continuous	Sum of responses to items 7–12 in section A of SBSSSTJEQ	Predictor
3	Supervision of instructional aids	SIA	Continuous	Sum of responses to items 13–18 in section A of SBSSSTJEQ	Predictor
4	Supervision of team teaching	STT	Continuous	Sum of responses to items 19–24 in section A of SBSSSTJEQ	Predictor
5	Teachers' job effectiveness generally	TJEG	Continuous	Average scores of lesson notes preparation, use of instructional materials and classroom management	Criterion
6	Lesson notes preparation	LNP	Continuous	Sum of scores of items 1–6 in section B of SBSSSTJEQ	Criterion
7	Use of instructional materials	UIM	Continuous	Sum of scores of items 7–12 in section B of SBSSSTJEQ	Criterion
8	Classroom management	CM	Continuous	Sum of scores of items 13–18 in section B of SBSSSTJEQ	Criterion

2.4. Validity and reliability

The items in the instrument were drawn in reflection of the research hypotheses. Before using the instrument, the items developed were given to four experts of school supervision in the Faculty of Educational Foundation Studies, University of Calabar, Nigeria. The experts assessed the draft copy of the instrument for content validity and provided qualitative feedback on the items considered clear and relevant in measuring the respective variables. Suggestions were also made to improve the clarity of ambiguous or double-barrelled items, whereas recommendations were made to discard items considered irrelevant. Face validity evidence was obtained from an interview of 10 teachers from the northeast education zone who took the survey and, upon completion, offered their views on the items in the questionnaire. Their suggestions assisted in revising items that were too direct and shortened the questionnaire to improve the response timing.

In determining the instruments reliability, the instrument was trial tested on 60 respondents (teachers) from public secondary schools in the northeast education zone of Akwa Ibom State, Nigeria. The teachers in the trial test differed from those who participated in the main study to avoid testwiseness (Bailey et al., 2021; Evans, 1984). After administering and retrieving

administered copies, responses were coded and subjected to an internal consistency reliability test using the Cronbach alpha approach. The reliability coefficient estimates from the result ranged from .83 to .88, suggesting that the items were consistent in measuring what they were meant to measure.

2.5. Ethical consideration

The national legislation of Nigeria exempted this study from receiving ethical clearance since it is survey-based and poses no physical risk of participation (see https://bit.ly/3pK9ORh). Although the national and institutional regulations consider survey studies risk-free, further efforts were made to ensure that none of the items posed psychological risks to participants. This was done by avoiding self-directed and personal information outside the studys focus. The respondents offered written informed consent after a clear explanation of the study's objectives, participation risk potentials, and how data will be analysed, used and managed upon completion of the exercise. De-identification and anonymisation were observed following the Safe Harbour Principles. Thus, we did not collect respondents' data such as names, emails, phone numbers and addresses for data integrity and confidentiality. Although respondents' biodata were collected, they were grouped so that respondents only ticked their choices. Participation in the research was voluntary, and respondents could exit the exercise anytime. Collected data were stored on a personal computer protected by a strong password, antivirus software, and a firewall. Participants knew that the data collected would be used for academic purposes and that aggregated data would be published in a peer-reviewed journal.

2.6. Data collection procedure

With the principals' agreement of each school, copies of the questionnaire were physically distributed throughout the sampled schools. The importance of the exercise and the value of giving honest answers were explained to the responders. Additionally, respondents were instructed to keep their attention on the task and answer each question honestly. Since all respondents were educators, administering the instrument was made more straightforward. Four research assistants who had undergone thorough physical training only for handing out questionnaires to respondents helped collect data. The data collection process took two months to complete. Administered copies of the questionnaire were retrieved from the respondents once it had been completed for analysis.

2.7. Data analysis procedures

After data collection, sorting and counting were done, it was discovered that 289 copies of the questionnaire were retrieved, suggesting a return rate of approximately 98%. A preliminary assessment was done to check for incomplete responses/missing data. Five of the 289 returned copies had vague answers. The five copies were discarded to avoid missing data during the coding and analysis process. Thus, the number of correctly filled questionnaire copies used for analysis was 284. In scoring the responses, 4, 3, 2 and 1 points were allocated toresponses indicating strongly agree, agree, disagree, and strongly disagree, respectively, for positively worded items. However, negatively worded items were scored in reverse order for all response options. The scores on all the items in corresponding sub-scales were added to obtain continuous data. A bootstrapping procedure in covariance-based structural equation modelling (CB-SEM) and multiple linear regression analysis were used for hypotheses testing at the .05 alpha level.

2.8. Hypotheses development

It is generally accepted in education that teacher effectiveness is a complex and multifaceted concept influenced by various factors (Burroughs et al., 2019; Park et al., 2019), including classroom observation, supervision of sporting activities, use of instructional aids, team teaching, and the maintenance of statutory records. Research has shown that these factors are all interrelated and can significantly impact teacher effectiveness. For example, classroom observation, in which a trained observer evaluates a teachers performance, has also been identified as an important factor in teacher effectiveness (Jones & Bergin, 2019). Classroom observation is a reliable and valid measure of teacher effectiveness and is associated with improved student achievement (Bellibaş

et al., 2022) and teacher practice (Garrett & Steinberg, 2015; Loughland & Vlies, 2016). Observations can provide valuable insights into teachers' instructional practices, such as questioning techniques, feedback, and engagement strategies (Martinez et al., 2016). The second hypothesis of this study was developed based on the above submission.

It is well established that principals play a crucial role in shaping the school culture and climate, which can significantly impact teachers' effectiveness. One way principals can influence teachers' effectiveness is by supervising sporting activities. According to a study, principals' supervision of extracurricular activities, including sports, can have a positive impact on teachers' morale (Barksdale, 2022; Benti & Tarekegne, 2022), job satisfaction (Sahara & Suriansyah, 2020; Yohannes & Wasonga, 2021) and commitment to the school (Aturida et al., 2021). This suggests that principal supervision of sporting activities can positively influence teacher effectiveness through its impact on teacher morale, commitment to the school, and job satisfaction. Consequently, the third hypothesis was developed.

There is evidence to suggest that principals' supervision of instructional aids can have a positive influence on teachers' effectiveness. According to a study, principals who provide ongoing support and supervision of instructional aids are more likely to have effective teachers using these resources (Bellibaş et al., 2022). When principals provide teachers with professional development on instructional aids and create a culture of support for their use, teachers are more likely to use these resources effectively in their classrooms (Kim et al., 2019; Leithwood & Jantzi, 2000). Thus, instructional aids, such as technology or multimedia resources, may increase teacher effectiveness. Two studies found that teacher effectiveness was positively correlated with instructional aids such as multimedia resources, hands-on materials, and manipulatives (Manafa, 2022; Olagunju et al., 2022). Based on this premise, the fourth hypothesis of this study was formulated.

Principals who provide effective supervision and support to teachers in team teaching situations can positively influence teacher effectiveness. According to some studies, teachers who received regular and specific feedback from their principals reported higher levels of job satisfaction and perceived effectiveness in their teaching (Reeves et al., 2022; Zhang et al., 2022). It has also been documented that principals actively involved in the planning and implementation of team-teaching strategies were more likely to have teachers who felt a greater sense of ownership and responsibility for student learning outcomes (Akah et al., 2022; Rao & Chen, 2020). Furthermore, team teaching is associated with improved student outcomes and teacher satisfaction and may be a factor in teacher effectiveness (Rytivaara et al., 2019; Strogilos & King-Sears, 2019; Tsybulsky & Muchnik-Rozanov, 2019). Collaborative teaching can provide teachers with the opportunity to share ideas and best practices, as well as to support one another in the classroom (Beninghof, 2020). From the preceding, the fifth hypothesis of this study was raised.

The maintenance of statutory records, such as attendance records and student progress reports, is important for teachers to demonstrate their compliance with regulations and to track their performance. Keeping accurate and up-to-date records, such as attendance and assessment records, may be a factor in teacher effectiveness (Arop et al., 2020; Owan & Agunwa, 2019). Accurate records can help teachers to track student progress and identify areas where students may be struggling, allowing them to adjust their instruction accordingly. Studies have found that principals who provided frequent and high-quality supervision of statutory records were more effective at fostering teachers' learning and development (Adegbesan et al., 2020; Amie-Ogan & Tagbo, 2021). Furthermore, it has been documented that principals who were effective in enforcing statutory regulations tended to have more effective teachers, as they were able to create a positive and supportive learning environment for their students (Elujekwute et al., 2021). As a consequence, the sixth hypothesis of this study was developed.

Considering each predictors role on teachers' effectiveness across various dimensions, it was also important to consider their combined prediction. Thus, the joint prediction of teacher

effectiveness requires the consideration of multiple factors, including classroom observation, supervision of sporting activities, use of instructional aids, team teaching, and the maintenance of statutory records. Further research is needed to understand the composite and specific relationships between these factors and teacher effectiveness. Along these lines, the first hypothesis was developed to determine the composite prediction of the predictors on the criterion variables. In line with the above, the following hypotheses were formulated for this study.

Hypothesis 1:

HA: There is a significant joint prediction of CO, SSA, SIA, STT and SSR on TJEG, LNP, UIM, and CM.

Ho: There is no significant joint prediction of CO, SSA, SIA, STT and SSR on TJEG, LNP, UIM, and CM.

Hypothesis 2:

HA: CO has a significant predictive relationship with TJEG, LNP, UIM and CM.

Ho: CO has no significant predictive relationship with TJEG, LNP, UIM and CM.

Hypothesis 3:

HA: SSA has a significant predictive relationship with TJEG, LNP, UIM and CM.

Ho: SSA has no significant predictive relationship with t TJEG, LNP, UIM and CM.

Hypothesis 4:

HA: SIA has a significant predictive relationship with TJEG, LNP, UIM and CM.

Ho: SIA has no significant predictive relationship with TJEG, LNP, UIM and CM.

Hypothesis 5:

HA: STT significantly predicts TJEG, LNP, UIM and CM.

Ho: STT does not significantly predict TJEG, LNP, UIM and CM.

Hypothesis 6:

HA: SSR significantly predicts TJEG, LNP, UIM and CM.

Ho: SSR does not significantly predict TJEG, LNP, UIM and CM.

Based on the above hypotheses, the model in Figure 1 was hypothesised.

In Figure 1, rectangular boxes represent the variables with error terms in oval shapes above them. Straight lines with one directional arrowhead are used for prediction, and curvy lines with two directional arrowheads are used for correlation. The image is on a white background, and no values are estimated.

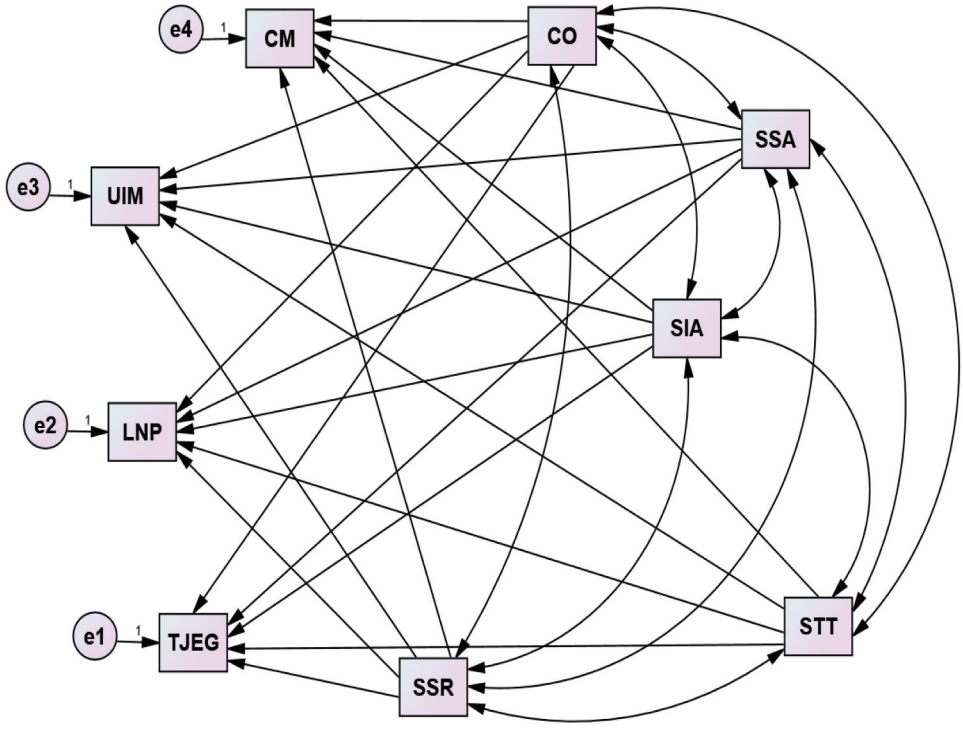

Figure 1. Hypothesised structural equation model linking school-based supervisory practices (SSPs) to teachers' job effectiveness indices

3. Results

Figure 2 demonstrates that school-based supervisory practices (SSPs) such as CO, SSA, SIA, STT and SSR jointly accounted for 5.7% (R^2 = .057, 95%*CI* = .028, .130, p < .01) of the total variance in TJEG with 94.3% of the unexplained portion of the variance attributable to other predictor variables not included in the model. Specifically, SSPs jointly predicted teachers' LNP, UIM and CM by 7.2% (R^2 = .072, 95%*CI* = .042, .159, p < .01), 1.6% (R^2 = .016, 95%*CI* = .010, .071, p < .01), and 8.4% (R^2 = .084, 95%*CI* = .051, .166, p < .01) respectively. This implies that additional variables not included in the model may account for 92.8, 98.4, and 91.6% of the unexplained proportion of the variation in teachers' LNP, UIM, and CM, respectively.

Figure 2 shows weak correlations among the predictor variables in the model. This implies no multicollinearity among the variables, making them excellent predictors in the same model. High levels of correlation among predictor variables may complicate the modelling and interpretation process (Frost, 2021).

Figure 2 is a structural equation model showing the links of six school-based supervisory practices such as classroom observation (CO), supervision of sporting activities (SSA), supervision of instructional aids (SIA), supervision of team teaching (STT), and supervision of school records (SSR) to teachers' job effectiveness generally, and in the dimensions of the use of instructional materials (UIM), lesson note preparation (LNP) and classroom management (CM). Rectangular boxes represent the variables with error terms in oval shapes above them. Straight lines with one directional arrowhead are used for prediction, and curvy lines with two directional arrowheads are used for correlation. The image is on a white background, and values have been estimated for each path.

A multivariate linear regression analysis was used to test for the significance of the joint prediction of SSPs on the criterion variables (TJEG, LNP, UIM and CM). Table 2 reveals a significant joint prediction of SSPs (classroom observation, supervision of sporting activities, supervision of instructional aids, supervision of team-teaching, supervision of statutory records)

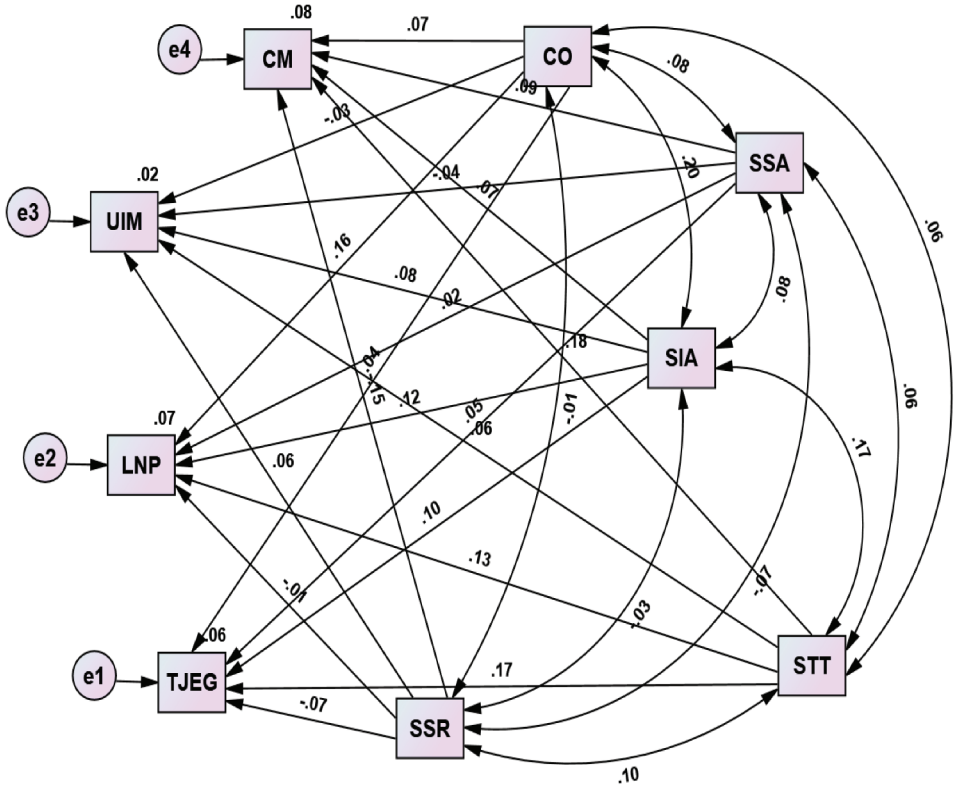

Figure 2. A structural equation model of the joint prediction of CO, SSA, SIA, STT and SSR on TJEG, LNP, UIM and CM

on TJEG, $F_{[5,\ 278]} = 3.36$, $p < .05$. Furthermore, Table 2 reveals that SSPs made a significant joint prediction on teachers' LNP ($F_{[5,\ 278]} = 4.32$, $p < .001$) and CM ($F_{[5,\ 278]} = 5.10$, $p < .001$) respectively. However, Table 2 shows no significant prediction of SSPs on teachers' use of instructional materials ($F_{[5,\ 278]} = 0.90$, $p > .05$). Thus, the null hypothesis received statistical support for TJEG, LNP and CM, respectively. On the contrary, the alternative hypothesis was supported for teachers' UIM. By ranking, the composite prediction of SSPs was stronger for CM, trailed by LNP, and TJEG in that order.

Hypothesis 2

Table 3 reveals that other things being equal, a 1% increase in the CO practices of principals is associated with a .04% increase in TJEG. Furthermore, it was predicted that, other things being equal, increasing the CO practices of principals by 1% is associated with 0.16 and 0.08% increments in the teachers' LNP and CM, respectively. However, it is shown that when the CO practices of principals go up by 1%, the UIM by teachers tend to decrease by 0.03%, assuming other factors remain unchanged. Table 3 shows no significant prediction of CO on TJEG (β = .04, $z = .69$, $p > .05$). Thus, the null hypothesis was supported, whereas the alternative hypothesis was not. Specifically, Table 3 indicates a significant prediction of CO on teachers' LNP (β = .16, $z = 2.72$, $p < .05$) but not on their UIM ($\beta = -.03$, $z = -.43$, $p > .05$) and CM (β = .07, $z = 1.25$, $p > .05$) in secondary schools. Based on these findings, the alternative hypothesis was supported for LNP, but not for UIM and CM, respectively.

Table 3 shows that a 1% increase in the SSA is connected to a 0.05% increase in TJEG, assuming other things remain equal. It was also predicted that a 1% increase in the SSA is proportional to 0.02 and 0.09% increments in teachers' LNP and CM, respectively, other things being equal. However, a 1% increase in SSA, other things being equal, was predicted to be associated with

Table 2. Multivariate linear regression results summary of the joint prediction of CO, SSA, SIA, STT and SSR on TJEG, LNP, UIM and CM

Models	Source	*SS*	*Df*	*MS*	*F*	*P*	*R*	R^2	*SE*
TJEG	Regression	39.56	5	7.91	3.36*	.01	.24	.06	1.53
	Residual	654.68	278	2.36					
	Total	694.24	283						
LNP	Regression	134.90	5	26.98	4.32**	.00	.27	.07	2.50
	Residual	1737.14	278	6.25					
	Total	1872.04	283						
UIM	Regression	33.56	5	6.71	0.90	.48	.13	.02	2.74
	Residual	2083.46	278	7.49					
	Total	2117.03	283						
CM	Regression	175.93	5	35.19	5.10**	.00	.29	.08	2.63
	Residual	1916.81	278	6.90					
	Total	2092.74	283						

**$p < .001$

*$p < .05$

cogent education

Table 3. Standardised relative prediction of CO, SSA, SIA, STT and SSR on TJEG, LNP, UIM and CM

Hypothesis			*B*	B	*95% CI*	*SE.*	*z*	*p*
CO	→	TJEG	.03	.04	−.06, .14	.04	.69	.49
CO	→	LNP	.16	.16	.04, .27	.06	2.72	.02*
CO	→	UIM	−.03	−.03	−.13, .09	.07	−.43	.64
CO	→	CM	.08	.07	−.03, .18	.06	1.25	.20
SSA	→	TJEG	.03	.05	−.07, .14	.03	.81	.47
SSA	→	LNP	.02	.02	−.09, .13	.05	.36	.78
SSA	→	UIM	−.04	−.04	−.14, .07	.06	−.66	.49
SSA	→	CM	.08	.09	−.01, .19	.05	1.55	.14
SIA	→	TJEG	.07	.10	.00, .19	.04	1.60	.10
SIA	→	LNP	.13	.12	.02, .22	.07	1.98	.03*
SIA	→	UIM	.09	.08	−.01, .17	.07	1.28	0.14
SIA	→	CM	.09	.08	−.04, .18	.07	1.27	.23
STT	→	TJEG	.10	.17	.05, .28	.03	2.95	.02*
STT	→	LNP	.12	.13	.04, .24	.06	2.18	.02*
STT	→	UIM	.06	.06	−.05, .17	.06	.93	.41
STT	→	CM	.18	.18	.07, .29	.06	3.11	***
SSR	→	TJEG	−.04	−.07	−.18, .03	.03	−1.23	.24
SSR	→	LNP	−.01	−.01	−.10, .09	.05	−.10	.88
SSR	→	UIM	.06	.06	−.04, .16	.06	1.03	.27
SSR	→	CM	−.14	−.15	−.25, −.05	.05	−2.64	.01*

**$p < .001$

*$p < .05$

a 0.04% decline in teachers' UIM. In testing for significance, Table 3 shows that the SSA has no significant predictive relationship with TJEG (β = .05, z = .81, p > .05). Similarly, Table 3 showed no significant predictive relationship of the SSA on teachers' LNP (β = .02, z = .36, p > .05), and UIM (β = −.04, z = −.66, p > .05) and CM (β = 0.09, z = 1.55, p > .05) in secondary schools. These results upheld the null hypothesis for all the criterion variables (TJEG, LNP, UIM, and CM).

Hypothesis 4

Table 3 predicts that a 1% increase in the standard deviation of SIA is connected to a 0.10% rise in the standard deviation of TJEG, everything else being equal. Other factors being equal, it was also predicted that a 1% increase in the standard deviation of SIA is associated with a .12, .08, and .08% rise in teachers' LNP, UIM and CM, respectively. Whilst testing for significance, Table 3 reveals that the SIA by secondary school principals has no significant predictive relationship with TJEG (β = .10, z = 1.60, p > .05). Specifically, our analysis showed no significant predictive relationship of the SIA with teachers' UIM (β = .08, z = 1.28, p > .05) and CM (β = .08, z = 1.27, p > .05). However, a significant predictive relationship of SIA with teachers' LNP (β = .12, z = 1.98, p < .05) was established. Based on this result, the null hypothesis was supported by evidence for TJEG, UIM and CM against the alternative hypothesis. However, the alternative hypothesis was supported for LNP in disfavouring the null hypothesis.

According to Table 3, a 1% increase in the standard deviation of SST is related to a 0.17% increase in the standard deviation of TJEG, other things being equal. With other variables being constant, it is further predicted that a 1% increase in the standard deviation of STT is associated with 0.13, 0.06, and 0.18% increase in teachers' LNP, UIM, and CM, respectively. Table 3 indicates

that STT significantly predicts secondary school TJEG (β = .17, z = 2.95, p < .05). Furthermore, it was revealed in a more specific sense, that there is a significant prediction of STT on teachers' LNP (β = .13, z = 2.18, p < .05) and CM (β = .18, z = 3.11, p < .001). However, no significant prediction was recorded of STT on teachers' UIM (β = .06, z = 0.93, p > .05). This implies that the null hypothesis only received statistical support for teachers' UIM. In contrast, it failed to receive support for TJEG, LNP and CM, respectively. Contrarily, the alternative hypothesis received empirical backing for TJEG, LNP and CM but failed to receive support for UIM.

Hypothesis 6

Table 3 shows that all things being equal, a 1% increase in principals' SSR is related to a .07% decrease in TJEG. It was also predicted that increasing administrators' SSR by 1% is linked to 0.01 and 0.15% decreases in teachers' LNP and CM, respectively, assuming other things remain the same. However, it is predicted that a 1% increase in administrators' SSR is correlated with a 0.06% increase in teachers' UIM, other things being equal. The test for significance in Table 3 reveals no significant prediction of SSR on secondary school TJEG (β = −.04, z = −1.23, p > .05). Similarly, no significant prediction of SSR was established for teachers' LNP (β = −.01, z = −.10, p > .05) and UIM (β = .06, z = 1.03, p > .05). However, Table 3 shows that SSR significantly predicted teachers' CM (β = −.14, z = −2.64, p < .05). Based on these results, the null hypothesis was supported for TJEG, LNP and UIM, but not CM. However, the result only supported the alternative hypothesis for CM but did not for TJEG, LNP and UIM.

4. Discussion

The first hypothesis of this study established a significant joint prediction of CO, SSA, SIA, STT, and SSR on TJEG, LNP and CM. This result implies that teachers' reported a higher level of job effectiveness across most dimensions, except in using instructional materials in schools where principals practised active and simultaneous engagement in diverse supervisory practices. The finding of this study aligns with other studies that have found a correlation between classroom observation and teachers' job performance (Edo & David, 2019; Nnebedum & Akinfolarin, 2017; Sule et al., 2015)

However, the present study discovered no significant joint prediction of SSPs on teachers' use of instructional materials. Although principals' inclusive supervisory activities benefit teachers' overall effectiveness, it does not substantially affect their use of instructional materials. The result, to a large extent, is not surprising because, for the most part, teachers' decision to use instructional materials or otherwise (in a given lesson) is theirs. This means that the supervision of activities, services and resources in schools can only promote instructional material use if teachers are self-willing to use the materials. Furthermore, this result may have been due to the poor availability of instructional materials or teachers' incapacitation to improvise unavailable instructional materials.

The study's second hypothesis established no significant prediction of CO on TJEG, UIM and CM. The result is attributed to the low extent of variance explained by CO to three criterion variables. This result disagrees with previous studies, which saw a substantial influence of principals' classroom visitation as a supervisory strategy on teachers' job performance (Ekpoh & Eze, 2015; Sule et al., 2012) and effectiveness (Iroegbu & Etudor-Eyo, 2016). The disagreement is attributed to differences in the designs, area of the studies, nature of the respondents, methodological differences and variations in the time the studies were conducted. Nevertheless, the result of the current research is not surprising because principals' mere visits to the classroom may not promote effectiveness if teachers are not offered constructive feedback at the end of the observation exercise. Another possibility for this outcome is that many teachers in the area of study are already proficient in the delivery of services, especially in the use of instructional materials and classroom management, such that principals' visit to the classroom does not add any more value to them.

The second hypothesis further documented a significant prediction of classroom observation on teachers' lesson note preparation in secondary schools. This result implies that teachers reporting more classroom observations by principals also reported improved lesson notes compared to similar teachers with limited classroom observation visits by principals. This aspect of the finding seems justified because the essence of principals' classroom observation is to help teachers improve on areas of weakness. This result corroborates the finding of Usman (2015) that regular instructional supervision significantly correlates with teachers' performance and the academic achievement of students in Secondary Schools.

Through the third hypothesis, this study uncovered an insignificant prediction of SSA on TJEG, LNP, UIM and CM. This finding is attributable to the modest variation explained by the supervision of sporting activities to teachers' job effectiveness variables. The result of the current study does not come as a surprise because sporting activities aim to improve the psychomotor attributes of school personnel and boost their health, keeping them in good shape. Admittedly, the supervision of sporting activities can improve teachers' participation in the sporting activities of schools. This is because employees who participate in sports generally have higher energy levels, leading to more rapid organisational growth ((Joubert & De Beer, 2011; Turkmen, 2013). However, the effectiveness of teachers goes beyond mere participation in sports to other instructional areas covered in the present study. The current studys result implies that a high rate of SSA does not improve (significantly) teachers' effectiveness in instructional areas, even though it may be helpful in psychomotor development and sound health.

This study's result disagrees with an earlier study (De Vries et al., 2017) that the influence of sports participation on work performance is statistically significant. However, the result of the third hypothesis also showed an inverse relationship between the supervision of sporting activities and teachers' use of instructional materials. This seems true because when teachers teach in the classroom where instructional materials are used, there is zero participation in sports; when teachers are participating in sports, they are not training with instructional materials. However, the finding disagrees with the results of Moran (2017) that the supervision of extracurricular activities is positively related to the job performance of educational professionals.

Through the fourth hypothesis, this study verified that SIA significantly predicts TJEG, UIM and CM, except LNP. These results were partly expected because the supervision of instructional aids by principals is an activity that can promote the availability, effective utilisation and longevity of instructional aids. However, SIA may not have predictively correlated with teachers' job effectiveness to a significant extent due to teachers' poor use of available materials. SIA allows for early detection of unavailable resources; those requiring repairs or replacement can be noticed during supervision. Furthermore, SIA can also create an avenue for teachers to direct how to use certain materials effectively. These activities by principals enable teachers to plan and teach their lessons effectively. Teachers' use of instructional materials promotes classroom management, as beautifully designed instructional materials can catch even disruptive students' attention. This is because instructional materials have direct contact with all sense organs (Olumorin, 2010). However, teachers need to use available resources to maximise these benefits actively. The positive effect of the predictor on the criterion variables suggests that the more principals supervise instructional aids, the higher the tendency of teachers to become effective in using available materials, lesson preparation and classroom management. The result corroborates the evidence earlier brought to the fore by Saad and Ibrahim (2016) that the supervision of instructional materials by principals impacts the teaching of economics in secondary schools.

The fifth finding of this study documented a significant positive prediction of STT on secondary school TJEG and in terms of LNP and CM, respectively. Nevertheless, no considerable prediction was made by STT on teachers' use of instructional materials. This result is highly anticipated because, in team teaching, more than one teacher instructs learners. The supervision of such a process is necessary because different teachers have different backgrounds and professional personality

identities that affect their perceptions, perspectives and approaches. Putting teachers with a mix of experience and perception could enable them to complement each others weaknesses with their strengths for collective goal attainment. However, confusion may arise as teachers struggle to take turns teaching, making it necessary for the process to be supervised. This finding corroborates the result earlier obtained by a previous study (Krammer et al., 2018) that showed a significant connection between the teachers' shared responsibility and 'enjoyment of the co-teaching processes, where teachers from self-selected teaching teams showed significantly more positive ratings.

The sixth hypothesis showed no significant prediction of SSR on secondary school TJEG, LNP and UIM, except for classroom management. The result of this study partly supports the finding of Sule et al. (2012) that principals' inspection of record-keeping strategy significantly influenced teachers' use of instructional materials but not in the general context of teachers' job effectiveness. The result of the present study, however, disagrees with the outcome of Okorie and Nwiyi (2014) that an effective record-keeping strategy enhances teachers' effectiveness in secondary schools. An explanation for this result is the inexplicit identification of specific records. There are many statutory records that a principal of a secondary school must keep. However, not all school records directly connect to what teachers do. It can be argued that the supervision of specific school records may affect specific teacher outcomes.

Thus, the treatment of SSR as a central concept may be held responsible for the outcome of the sixth hypothesis. This strengthens the finding of Owo (2014) that keeping day-to-day administrative records is the duty of the principals, but how these records are supported may be more critical. While it can be argued that the adequate supervision of most of these records should contribute to teachers' job effectiveness, the supervision of others may not. Furthermore, the attitude of the principals towards playing their supervisory roles in managing school records could be another explanation for the outcome of this study. This aligns with the study of Omoha (2013), which revealed many problems associated with records management in the secondary school system. The result also confirms the analysis of Khali (2014), which found that many government schools keep their records in paper format despite advancements in the electronic era in government schools. All these shortcomings could be the reasons why the supervision of school records did not predict teachers' job effectiveness to a significant extent.

5. Conclusion

This study used a bootstrapping procedure in a covariance-based structural equation modelling to assess the predictive relationship of school-based supervisory practices to teachers' job effectiveness across three indicators. The result of this study provided evidence that school-based supervision is essential in promoting teachers' job effectiveness in one way or another. Although different indicators of teachers' job effectiveness tended to be more susceptible to different supervisory practices, adopting inclusive school-based supervision (practising different strategies simultaneously) is the most effective in achieving teachers' job effectiveness generally and in specific aspects. The implication of this study to practice is that school managers that observe classrooms supervise sporting activities, instructional aids, team-teaching, and statutory records simultaneously are more likely to command a higher degree of effectiveness among teachers than those fulfilling one at a time. Teachers' use of instructional materials seems to be the aspect least affected by the practice of school-based supervision at both the relative and composite levels. This implies that adopting varied approaches to school supervision may improve teachers' use of instructional materials, but not significantly. This study can encourage school principals to gain more knowledge, facts and strategies required for effective and efficient school-based supervision. It can also enable teachers to appreciate the need for school-based supervision geared toward improving their classroom instructional practices and judiciously utilise opportunities for further professional development to keep abreast with global educational changes. This study has further contributed to the existing literature on school-based supervision and teachers' job effectiveness in Nigeria; it can also serve practical purposes in other contexts.

5.1. Recommendations

Based on the conclusion of this study, the following recommendations were made.

(1) Secondary school principals should ensure that they pay regular classroom visits to observe teachers deliver lessons in the classroom. At the end of such observations, clear feedback should be offered to teachers regarding areas of strengths and weaknesses, with suggestions that can help them improve.

(2) Principals should always find time amidst their tight administrative schedules to supervise school sporting activities. This should promote teachers' and students' participation for the overall benefit of the school.

(3) Principals of secondary schools should always ensure that instructional aids in their schools are regularly assessed. This will enable them to identify unavailable ones for procurement or detect those that need repairs or replacement. Teachers' use of instructional materials in the classroom should also be checked during classroom observation visits by school administrators to ensure that teachers use teaching aids suitable to the age of the learners.

(4) When a team of teachers are assigned to teach in the same classroom, principals should ensure that such groups are appropriately supervised and guided on how to take turns in the instructional delivery process to avoid confusion among teachers.

(5) Secondary school managers should ensure that different school records such as movement books, lesson notes, diaries, attendance registers, teachers' time books, continuous assessment books, the school timetable, staff record book, punishment book and logbook, among others, are regularly assessed, graded and updated. This will enable them to identify truant, ineffective and under-performing teachers for necessary actions.

(6) Principals of secondary school should ensure myriad school-based supervision such as classroom observation, supervision of sporting activities, management of instructional aids, control of team-teaching, and maintenance of statutory records are concurrently practised in the school to contribute immensely to teachers' job effectiveness generally and in specific aspects.

Author details
Valentine J. Owan[1]
E-mail: owanvalentine@gmail.com
ORCID ID: http://orcid.org/0000-0001-5715-3428
Abraham J. Johnson[2]
Rosemary O. Osim[2]
German E. Anagbogu[3]
Bernard D. Otu[3]
Stephen B. Undie[3,4]
Joseph O. Ogabor[4]
Martina A Apie[4]
Scholastica C. O. Ekere[4]
[1] Department of Human Kinetics and Health Education, University of Calabar, Calabar, Nigeria.
[2] Ultimate Research Network (URN), Calabar, Nigeria.
[3] Department of Educational Management, University of Calabar, Calabar, Nigeria.
[4] Department of Educational Foundations, University of Calabar, Calabar, Nigeria.

Disclosure statement
No potential conflict of interest was reported by the authors.

Citation information
Cite this article as: School-Based Supervisory Practices and Teachers' Job Effectiveness Using Bootstrapping in Covariance-Based Structural Equation Modelling, Valentine J. Owan, Abraham J. Johnson, Rosemary O. Osim, German E. Anagbogu, Bernard D. Otu, Stephen B. Undie, Joseph O. Ogabor, Martina A Apie & Scholastica C. O. Ekere, *Cogent Education* (2023), 10: 2168406.

References

Adegbesan, S. O., Balogun, Z. B., Ajao, R. L., & Olawale, S. S. (2020). Record keeping as a measure of effective administration in secondary schools: Planning strategies. *Journal of Contemporary Issues in Educational Planning and Administration*, *5*(2), 1–7. https://bit.ly/3GKHfMB

Aduma, P. O., Owan, V. J., Akah, L. U., Alawa, D. A., Apie, M. A., Ogabor, J. O., Olofu, M. A., Unimna, F. A., Ebuara, V. O., Essien, E. E., & Essien, C. K. (2022). Interactive analysis of demographic variables and occupational stress on university lecturers' job performance. *Humanities and Social Sciences Letters*, *10* (2), 88–102. https://doi.org/10.18488/73.v10i2.2952

Akah, L. U., Owan, V. J., Aduma, P. O., Onyenweaku, E. O., Olofu, M. A., Alawa, D. A., Ikutal, A., & Usoro, A. A. (2022). Occupational stress and academic staff job performance in two Nigerian universities. *Journal of Curriculum and Teaching*, *11*(5), 64–78. https://doi.org/10.5430/jct.v11n5p64

Al-Kiyumi, A., & Hammad, W. (2019). Instructional supervision in the Sultanate of Oman: Shifting roles and practices in a stage of educational reform. *International Journal of Leadership in Education*, *22* (2), 237–249. https://doi.org/10.1080/13603124.2018.1543570

Amie-Ogan, T. O., & Tagbo, S. (2021). Principals' record-keeping practices for enhanced administrative effectiveness in public senior secondary schools in Rivers State. *International Journal of Innovative*

Information Systems, *9*(3), 78–88. https://bit.ly/3jYF53c

Anani, O. A., Badaki, J. V., & Kamai, R. (2016). Effects of feedback intervention on team-teaching in English language classrooms in Nigeria. *Journal of Education and Practice*, *7*(25), 27–43. https://eric.ed.gov/?id=EJ1115848

Arop, F. O., Mbon, U. F., Ekanem, E. E., Ukpabio, G. E., Uko, E. S., & Okon, J. E. (2020). School management practices, teachers effectiveness, and students' academic performance in mathematics in secondary schools of Cross River State, Nigeria. *Humanities and Social Sciences Letters*, *8*(3), 298–309. https://doi.org/10.18488/JOURNAL.73.2020.83.298.309

Arop, F. O., Owan, V. J., & Ekpang, M. A. (2018a). Administrators' conflict management strategies utilisation and job effectiveness of secondary school teachers in obubra local government area, Cross River State, Nigeria. *IIARD International Journal of Economics and Business Management*, *4*(7), 11–21. https://doi.org/10.5281/zenodo.4320490

Arop, F. O., Owan, V. J., & Ekpang, M. A. (2018b). School hazards management and teachers' job effectiveness in secondary schools in Ikom Local Government Area, Cross River State, Nigeria. *International Journal of Education and Evaluation*, *4*(9), 38–49. https://doi.org/10.5281/zenodo.4320554

Arop, F. O., Owan, V. J., & Ibor, I. O. (2019). School quality indicators and secondary school teachers' job performance in Cross River State, Nigeria. *International Journal of Education and Evaluation*, *5*(3), 19–28. https://goo.gl/UZ7ELd

Aturida, D., Lian, B., & Putra, A. Y. (2021 ()). *Management of character education at SMA Negeri 1 Semendawai Barat. Proceedings of the International Conference on Education Universitas PGRI Palembang (INCoEPP* 2021) (pp. 913–918). Dordrecht, the Netherlands: Atlantis Press. https://doi.org/10.2991/assehr.k.210716.180

Bailey, C. D., Briggs, J. W., & Irving, J. H. (2021). Test-wiseness and multiple-choice accounting questions: Implications for instructors. *Issues in Accounting Education*. https://doi.org/10.2308/ISSUES-2021-025

Barahona, M. (2019). What matters to supervisors and is this reflected in what they do? Analysing the work of university supervisors of the practicum. *Journal of Education for Teaching*, *45*(3), 262–276. https://doi.org/10.1080/09589236.2019.1599509

Barksdale, T. (2022). *A sense of belonging: An examination of the impact of leadership behaviors on teacher morale in rural middle schools*. (Doctoral dissertation), Gardner-Webb University. https://digitalcommons.gardner-webb.edu/education-dissertations/88

Bassey, B. A., Owan, V. J., & Eze, E. A. (2019). Nexus between students', teachers' and school system effectiveness: Construction and factorial validity of a measuring instrument. *British Journal of Education*, *7*(7), 62–75. https://tinyurl.com/y3hr7jd3

Bellibaş, M. Ş., Polatcan, M., & Kılınç, A. Ç. (2022). Linking instructional leadership to teacher practices: The mediating effect of shared practice and agency in learning effectiveness. *Educational Management Administration & Leadership*, *50*(5), 812–831. https://doi.org/10.1177/1741143220945706

Beninghof, A. M. (2020). *Co-teaching that works: Structures and strategies for maximising student learning*. John Wiley & Sons. https://bit.ly/3VTjKFE

Benti, N., & Tarekegne, W. (2022). The current state of secondary school teachers' morale competence to teach. *Cogent Education*, *9*(1), 2154948. https://doi.org/10.1080/2331186X.2022.2154948

Burns, R. W., Jacobs, J., & Yendol-Hoppey, D. (2016). The changing nature of the role of the university supervisor and function of preservice teacher supervision in an era of clinically-rich practice. *Action in Teacher Education*, *38*(4), 410–425. https://doi.org/10.1080/01626620.2016.1226203

Burroughs, N., Gardner, J., Lee, Y., Guo, S., Touitou, I., Jansen, K., & Schmidt, W. (2019). A Review of the Literature on Teacher Effectiveness and Student Outcomes. In N. Burroughs, J. Gardner, Y. Lee, S. Guo, I. Touitou, K. Jansen, & W. Schmidt (Eds.), *Teaching for Excellence and Equity* (pp. 7–17). Springer International Publishing. https://doi.org/10.1007/978-3-030-16151-4_2

Calisang, M. G.-S. R. P., & Futalan, M. C. Z. (2020). Motivation in relation to teachers' performance. *International Journal of Scientific and Research Publications (IJSRP)*, *5*(5), 10071. https://doi.org/10.13140/RG.2.2.10859.87846

Castro-Sánchez, M., Zurita-Ortega, F., García-Marmol, E., & Chacón-Cuberos, R. (2019). Motivational climate in sports is associated with life stress levels, academic performance and physical activity engagement of adolescents. *International Journal of Environmental Research and Public Health*, *16*(7), 1198. https://doi.org/10.3390/ijerph16071198

Chang, S.-C., & Hwang, G.-J. (2018). Impacts of an augmented reality-based flipped learning guiding approach on students' scientific project performance and perceptions. *Computers & Education*, *125*, 226–239. https://doi.org/10.1016/j.compedu.2018.06.007

Cresewell, J. (2011). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson.

Dambo, D., Anele, E. U., Lawal, F. K., Asuke, U. A., & Yashim, E. Y. (2019). Assessing the effectiveness of team teaching on performance in Biology among selected SSII students of Giwa Educational Zone, Zaria-Nigeria. *Journal of Emerging Trends in Educational Research and Policy Studies*, *10*(3), 140–144. https://doi.org/10.10520/EJC-1cfeb8073a

De Vries, A. J., Koolhaas, W., Zwerver, J., Diercks, R. L., Nieuwenhuis, K., Van Der Worp, H., Brouwer, S., & Van Den Akker-Scheek, I. (2017). The impact of patellar tendinopathy on sports and work performance in active athletes. *Research in Sports Medicine*, *25*(3), 253–265. https://doi.org/10.1080/15438627.2017.1314292

Donnelly, J. E., Greene, J. L., Gibson, C. A., Sullivan, D. K., Hansen, D. M., Hillman, C. H., Poggio, J., Mayo, M. S., Smith, B. K., Lambourne, K., Herrmann, S. D., Scudder, M., Betts, J. L., Honas, J. J., & Washburn, R. A. (2013). Physical activity and academic achievement across the curriculum (A + PAAC): Rationale and design of a 3-year, cluster-randomised trial. *BMC Public Health*, *13*(1), 307. https://doi.org/10.1186/1471-2458-13-307

Edet, A. O., Benson, U. R., & Williams, R. E. (2017). Principals' conflict resolution strategies and teachers' job effectiveness in public secondary schools in Akwa Ibom State, Nigeria. *Journal of Educational and Social Research*, *7*(2), 153–158. https://doi.org/10.5901/jesr.2017.v7n2p153

Edo, B. L., & David, A. A. (2019). Influence of school supervision strategies on teachers' job performance in senior secondary schools in Rivers State. *International Journal of Innovative Development and Policy Studies*, *7*(4), 45–54. https://bit.ly/3T3PrMe

Egwu, S. O. (2015). Principals' performance in the supervision of classroom instruction in Ebonyi state

secondary schools. *Journal of Education and Practice*, *6*(15), 99–105. https://files.eric.ed.gov/fulltext/EJ1079965.pdf

Ekpoh, U. I., & Eze, A. (2015). Principals' supervisory techniques and teachers' job performance in secondary schools in ikom education zone, Cross River State, Nigeria. *British Journal of Education*, *3*(6), 31–40. https://bit.ly/3QPWAOl

Elenwo, P. M. (2018). Principals' supervision and academic performance of secondary school students in Rivers State. *International Journal of Innovative Social & Science Education Research*, *6*(4), 7–15. https://bit.ly/3C7qskZ

Elujekwute, E. C., Shir, J. N., & Elujekwute, L. A. (2021). Principals supervisory technique as correlate of teachers job performance in public secondary schools in Zone C Senatorial District of Benue State, Nigeria. *Journal of Education, Science and Gender Studies*, *3* (1), 201–223. https://bit.ly/3W9VeQN

Ereh, C. E., & Okon, N. N. (2015). Keeping of teachers' records and principals' administrative effectiveness in Akwa Ibom state secondary schools, Nigeria. *International Journal of Education, Learning and Development*, *4*(1), 40–44. https://bit.ly/3dxQWlf

Etiubon, R. U., & Akpan, A. O. (2017). Science teachers' perception of ICT capacity building workshop in Akwa Ibom state secondary schools, Nigeria. *African Research Review*, *11*(2), 201. https://doi.org/10.4314/afrrev.v11i2.15

Evans, W. (1984). Test wiseness. *The Journal of Experimental Education*, *52*(3), 141–144. https://doi.org/10.1080/00220973.1984.11011883

Ezenwosu, N. E., Esomonu, N. P. M., & Akudolu, L. R. (2015). A comparison of the effect of team teaching approach and single teacher teaching approach on senior students' essay/letter writing performance. *Journal of Emerging Trends in Educational Research and Policy Studies*, *6*(4), 315–320. https://doi.org/10.10520/EJC179925

Fatimayin, F., & Jacob, O. N. (2022). Impact of school plant on English teachers job performance in public secondary school federal capital territory, Abuja, Nigeria. *Riwayat: Educational Journal of History and Humanities*, *5*, 1. https://doi.org/10.24815/jr.v5i1.25035

Frost, J. (2021). *Multicollinearity in regression analysis: Problems, detection and solutions. Making statistics intuitive*. (Web Page), Statistics by Jim. https://bit.ly/3Ak7kPn

Garrett, R., & Steinberg, M. P. (2015). Examining teacher effectiveness using classroom observation scores: Evidence from the randomisation of teachers to students. *Educational Evaluation and Policy Analysis*, *37* (2), 224–242. https://doi.org/10.3102/0162373714537551

Grissom, J. A., Blissett, R. S. L., & Mitani, H. (2018). Evaluating school principals: Supervisor ratings of principal practice and principal job performance. *Educational Evaluation and Policy Analysis*, *40*(3), 446–472. https://doi.org/10.3102/0162373718783883

Haghighi, H., Jafarigohar, M., Khoshsima, H., & Vahdany, F. (2019). Impact of flipped classroom on EFL learners' appropriate use of refusal: Achievement, participation, perception. *Computer Assisted Language Learning*, *32*(3), 261–293. https://doi.org/10.1080/09588221.2018.1504083

Hofer, S. I., Schumacher, R., Rubin, H., & Stern, E. (2018). Enhancing physics learning with cognitively activating instruction: A quasi-experimental classroom intervention study. *Journal of Educational Psychology*, *110*(8), 1175–1191. https://doi.org/10.1037/edu0000266

Iroegbu, E. E., & Etudor-Eyo, E. (2016). Principals' instructional supervision and teachers' effectiveness. *British Journal of Education*, *4*(7), 99–109. https://bit.ly/3dzN1Vm

Jones, E., & Bergin, C. (2019). Evaluating teacher effectiveness using classroom observations: A Rasch analysis of the rater effects of principals. *Educational Assessment*, *24*(2), 91–118. https://doi.org/10.1080/10627197.2018.1564272

Joubert, Y. T., & De Beer, J. J. (2011). Benefits of team sport for organisations. *South African Journal for Research in Sport, Physical Education and Recreation*, *33*(3), 59–72. https://bit.ly/3QGoYCe

Khali, A. (2014). Records management in government secondary schools: The case study of Kaduna north local government, Kaduna State, Nigeria. *IOSR Journal of Humanities and Social Science*, *19*(1), 55–60. https://doi.org/10.9790/0837-19145560

Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st-century learners. *Research in Comparative and International Education*, *14*(1), 99–117. https://doi.org/10.1177/1745499919829214

Kostko, A. (2019). The impact of team teaching on student attitudes and classroom performance in introductory philosophy courses. *Teaching Philosophy*, *42* (4), 329–354. https://doi.org/10.5840/teachphil20191017111

Krammer, M., Rossmann, P., Gastager, A., & Gasteiger-Klicpera, B. (2018). Ways of composing teaching teams and their impact on teachers' perceptions about collaboration. *European Journal of Teacher Education*, *41*(4), 463–478. https://doi.org/10.1080/02619768.2018.1462331

Laine, S., Hotulainen, R., & Tirri, K. (2019). Finnish elementary school teachers' attitudes toward gifted education. *Roeper Review*, *41*(2), 76–87. https://doi.org/10.1080/02783193.2019.1592794

Lai, Y.-C., & Peng, L.-H. (2019). Effective teaching and activities of excellent teachers for the sustainable development of higher design education. *Sustainability*, *12*(1), 28. https://doi.org/10.3390/su12010028

Lee, L. M. (2022). It takes a village: Team teaching in an integrated and spiralled medical sciences curriculum. *The FASEB Journal*, *36*, S1. https://doi.org/10.1096/fasebj.2022.36.S1.R5445

Leithwood, K., & Jantzi, D. (2000). The effects of transformational leadership on organizational conditions and student engagement with school. *Journal of Educational Administration*, *38*(2), 112–129. https://doi.org/10.1108/09578230010320064

Liu, S., & Hallinger, P. (2018). Teacher development in rural China: How ineffective school leadership fails to make a difference. *International Journal of Leadership in Education*, *21*(6), 633–650. https://doi.org/10.1080/13603124.2017.1294266

Loughland, T., & Vlies, P. (2016). The validation of a classroom observation instrument based on the construct of teacher adaptive practice. *The Educational and Developmental Psychologist*, *33*(2), 163–177. https://doi.org/10.1017/edp.2016.18

Lyonga, N. A. N. (2018). Supervision and teachers' work performances in primary schools in Konye subdivision in Cameroon. *Journal of Educational and Social Research*, *8*(2), 115–124. https://doi.org/10.2478/jesr-2018-0022

Manafa, I. (2022). Influence of availability of instructional facilities on teachers' effectiveness in public primary

schools in Anambra state. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *7*(2), 72–81. https://ajemates.org/index.php/ajemates/article/view/177

Marey, R., Hesham, G., Magdd, A., & Toprak, M. (2020). Re-conceptualising teacher evaluation and supervision in the light of educational reforms in Egypt. *Social Sciences & Humanities Open*, *2*(1), 100081. https://doi.org/10.1016/j.ssaho.2020.100081

Martinez, F., Taut, S., & Schaaf, K. (2016). Classroom observation for evaluating and improving teaching: An international perspective. *Studies in Educational Evaluation*, *49*, 15–29. https://doi.org/10.1016/j.stueduc.2016.03.002

Mbon, U. F., Ukpabio, G. E., Ekanem, E. E., Okon, J. E., Uko, E. S., Ngaji, M. N., & Okon, E. E. (2020). Wastage of school material resources and secondary school system effectiveness: Evidence from a survey in Nigeria. *Humanities and Social Sciences Letters*, *8*(3), 264–279. https://doi.org/10.18488/journal.73.2020.83.264.279

Moran, J. P. (2017). *The impact of extracurricular activity on teacher job satisfaction*. (Doctoral Dissertation), Youngstown State University. https://bit.ly/3QM7gx5

Nnebedum, C., & Akinfolarin, A. V. (2017). Principal's supervisory techniques as correlates of teachers' job performance in secondary schools in Ebonyi State, Nigeria. *International Journal for Social Studies*, *3*(10), 13–22. https://files.eric.ed.gov/fulltext/ED581535.pdf

Odigwe, F. N., Bassey, B. A., & Owan, V. J. (2020). Data management practices and educational research effectiveness of university lecturers in South-South Nigeria. *Journal of Educational and Social Research*, *10*(3), 24–34. https://doi.org/10.36941/jesr-2020-0042

Odigwe, F. N., & Owan, V. J. (2019). Data management practices and educational research effectiveness of university Lecturers in South-South Nigeria. In C. A. Shoniregun (Ed.), *London International Conference on Education (LICE-2019)* (pp. 86–94). London, UK: Infonomics Society. https://doi.org/10.2053/LICE.2019.0021

Ojo, O. O., & Obimuyiwa, G. A. (2019). Electronic record-keeping system and administrative effectiveness of polytechnics in Ogun State, Nigeria. *Nigerian Journal of Educational Foundations*, *18*(1), 184–193. https://bit.ly/3zUJIzz

Okorie, F. S., & Nwiyi, G. U. (2014). The principal's supervisory strategies and teacher's effectiveness in secondary schools in Akwa Ibom State. *Academic Discourse: An International Journal County*, *7*(1), 1–8. https://bit.ly/3QKjcQ1

Olagunju, E., Gueta, M. F. D., Katu, D., & Hedd-Williams, G. (2022). Factors influencing the effectiveness of mathematics teaching and learning in high schools in Maryland County, Southeast Liberia. *Indonesian Journal of Education Teaching and Learning (IJETL)*, *2*(1), 8–17. http://jurnal.upmk.ac.id/index.php/Ijetl/article/download/1559/877/

Olayinka, A.-R. B. (2016). Effects of instructional materials on secondary schools students' academic achievement in social studies in Ekiti State, Nigeria. *World Journal of Education*, *6*(1), 32–39. https://doi.org/10.5430/wje.v6n1p32

Oleforo, N. A., Ikpe, U. I., & Bassey, E. A. (2015). Management strategies and secondary school teachers' job performance in Akwa Ibom South Senatorial District. *Asian Journal of Management Sciences & Education*, *4*(2), 151–159. https://bit.ly/3bZZMrB

Oluchi, F. (2013). Decision making and job satisfaction as correlates of teachers' job performance in junior secondary schools in Abia State, Nigeria. *Mediterranean Journal of Social Sciences*, *4*(8), 107–112. https://doi.org/10.5901/mjss.2013.v4n8p107

Olumorin, C. O. (2010). Development of instructional materials from local resources for art-based courses. *Asian Journal of Information Technology*, *9*(2), 107–110. https://doi.org/10.3923/ajit.2010.107.110

Omoha, F. (2013). *Management of school records in secondary schools in Otukpo Education Zone*. (Master's Thesis), University of Nigeria. https://bit.ly/3duaKWQ

Omori, A. E., & Bassey, P. U. (2019). Demographic characteristics and workers' performance in public service in Nigeria. *International Journal of Research and Innovation in Social Science*, *3*(2), 2454–6186. https://bit.ly/3waOjfN

Owan, V. J. (2018). *Conflict management strategies and secondary school teachers' job effectiveness in Obubra Local Government Area of Cross River* State, *Nigeria*. (B.Ed. Project), University of Calabar. https://doi.org/10.13140/RG.2.2.35015.55200

Owan, V. J. (2019). School-community relationship and school system effectiveness in secondary schools in Cross River State. *World Journal of Vocational Education and Training*, *1*(1), 11–19. https://doi.org/10.18488/journal.119.2019.11.11.19

Owan, V. J. (2021). Predictive path modelling of indicators of secondary school instructors' affective, continuance and normative job commitment. *Journal of International Cooperation and Development*, *4*(2), 86–108. https://doi.org/10.36941/jicd-2021-0015

Owan, V. J., & Agunwa, J. N. (2019). Principals' administrative competence and teachers' work performance in secondary schools in Calabar Education Zone of Cross River State, Nigeria. *Humanities and Social Sciences Letters*, *7*(1), 20–28. https://doi.org/10.18488/journal.73.2019.71.20.28

Owan, V. J., Akah, L. U., Ogbeche, M. M., & Obla, M. E. (2021). Professional variables and staff readiness to utilise internet-based channels for research communication in an Era of Covid-19. *Library Philosophy and Practice (e-Journal)*, *(2021*(Article), 5863. https://doi.org/10.21203/rs.3.rs-650213/v1

Owan, V. J., Asuquo, M. E., & Etudo-Eyor, E. (2022). Leadership styles, public relation skills and School-community collaboration: A quantitative analysis of the perception of stakeholders. *International Journal of Leadership in Education*, 1–23. https://doi.org/10.1080/13603124.2022.2045627

Owan, V. J., Odigwe, F. N., Okon, A. E., Duruamaku-Dim, J. U., Ubi, I. O., Emanghe, E. E., Owan, M. V., & Bassey, B. A. (2022). Contributions of placement, retraining and motivation to teachers' job commitment: Structural equation modelling of the linkages. *Heliyon*, *8*(4), e09334.

Owenvbiugie, R. O., & Ibadin, V. O. (2017). Principals' leadership styles as nexus to the job performance of teachers in senior secondary schools in Edo state, Nigeria. *International Journal of Development and Sustainability*, *6*(12), 2162–2173. https://isdsnet.com/ijds-v6n12-25.pdf

Owo, J. N. (2014). Record keeping practices of secondary school principals: An Enugu state education zone study. *International Journal of Education and Research*, *2*(10), 383–392. https://bit.ly/3SVp1fB

Pandita, R. (2012). *Correlational research*. Web.

Park, Y., Brownell, M. T., Bettini, E. F., & Benedict, A. E. (2019). Multiple dimensions of instructional

effectiveness in reading: A review of classroom observation studies and implications for special education classrooms. *Exceptionality*, *27*(1), 1–17. https://doi.org/10.1080/09362835.2017.1283628

Rao, Z., & Chen, H. (2020). Teachers' perceptions of difficulties in team teaching between local- and native-English-speaking teachers in EFL teaching. *Journal of Multilingual and Multicultural Development*, *41*(4), 333–347. https://doi.org/10.1080/01434632.2019.1620753

Rashid, A. (2012). *Research methods in education*. Web.

Reeves, T. D., Hamilton, V., & Onder, Y. (2022). Which teacher induction practices work? Linking forms of induction to teacher practices, self-efficacy, and job satisfaction. *Teaching and Teacher Education*, *109* (Article), 103546. https://doi.org/10.1016/j.tate.2021.103546

Rohrer, J. M. (2018). Thinking clearly about correlations and causation: Graphical causal models for observational data. *Advances in Methods and Practices in Psychological Science*, *1*(1), 27–42. https://doi.org/10.1177/2515245917745629

Rosato, A., Tenori, L., Cascante, M., De Atauri Carulla, P. R., Martins Dos Santos, V. A. P., & Saccenti, E. (2018). From correlation to causation: Analysis of metabolomics data using systems biology approaches. *Metabolomics*, *14*(4), 37. https://doi.org/10.1007/s11306-018-1335-y

Rytivaara, A., Pulkkinen, J., & de Bruin, C. L. (2019). Committing, engaging and negotiating: Teachers' stories about creating shared spaces for co-teaching. *Teaching and Teacher Education*, *83*, 225–235. https://doi.org/10.1016/j.tate.2019.04.013

Saad, K. M., & Ibrahim, U. (2016). Principals' supervision of teachers' use of instructional materials in teaching economics in secondary schools in Gombe State. *Journal of Science, Technology & Education*, *4*(4), 174–182. https://bit.ly/3QsVFDD

Sahara, B., & Suriansyah, A. (2020). Relationship of principal leadership style, teacher work culture, teacher competency, teacher job satisfaction and performance of special school teachers in banjarbaru city. *Journal of K6 Education and Management*, *3*(4), 505–518. https://doi.org/10.11594/jk6em.03.04.10

Savolainen, H., Engelbrecht, P., Nel, M., & Malinen, O.-P. (2012). Understanding teachers' attitudes and self-efficacy in inclusive education: Implications for pre-service and in-service teacher education. *European Journal of Special Needs Education*, *27*(1), 51–68. https://doi.org/10.1080/08856257.2011.613603

Setia, M. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology*, *61*(3), 261. https://doi.org/10.4103/0019-5154.182410

Sherri, L. (2011). *Research methods and statistics: A critical thinking approach*. Cengage Learning.

Singh, A., & Mishra, S. (2015). Extracurricular activities and student's performance in secondary school of government and private schools. *International Journal of Sociology and Anthropology Research*, *1*(1), 53–61. https://bit.ly/3QKknip

Soto-Pérez, M., Sánchez-García, J. Y., & Núñez-Ríos, J. E. (2020). Factors to improve job performance and school effectiveness. *International Journal of Educational Management*, *34*(5), 805–822. https://doi.org/10.1108/IJEM-07-2019-0237

Strogilos, V., & King-Sears, M. E. (2019). Co-teaching is extra help and fun: Perspectives on co-teaching from middle school students and co-teachers. *Journal of Research in Special Educational Needs*, *19*(2), 92–102. https://doi.org/10.1111/1471-3802.12427

Sule, M. A., Ameh, E., & Egbai, M. E. (2015). Instructional supervisory practices and teachers' role effectiveness in public secondary schools in Calabar south local government area of Cross River State, Nigeria. *Journal of Education and Practice*, *6*(23), 43–47. https://eric.ed.gov/?id=EJ1079011

Sule, M. A., Arop, F. O., & Alade, F. O. (2012). Principal's classroom visitation and inspection, and teachers' job performance in Akwa-Ibom State, Nigeria. *Research on Humanities and Social Sciences*, *2*(11), 106–111. https://bit.ly/3PqWIT2

Tsybulsky, D., & Muchnik-Rozanov, Y. (2019). The development of student-teachers' professional identity while team-teaching science classes using a project-based learning approach: A multi-level analysis. *Teaching and Teacher Education*, *79*, 48–59. https://doi.org/10.1016/j.tate.2018.12.006

Turkmen, M. (2013). The relationships between gender, physical self-perception, sport experience, motivation orientations and academic success. *International Journal of Academic Research*, *5*(5), 66–72. https://doi.org/10.7813/2075-4124.2013/5-5/B.10

Yohannes, M. E., & Wasonga, T. A. (2021). Leadership styles and teacher job satisfaction in Ethiopian schools. *Educational Management Administration & Leadership*, (Article), 17411432211041625. https://doi.org/10.1177/17411432211041625

Zhang, J., Huang, Q., & Xu, J. (2022). The relationships among transformational leadership, professional learning communities and teachers' job satisfaction in China: What do the principals think? *Sustainability*, *14*(4), 2362. https://doi.org/10.3390/su14042362

Cogent Education **(ISSN: 2331-186X) is published by Cogent OA, part of Taylor & Francis Group.**